

REPORT ON INTERNAL CONTROL: IMPACT ON FINANCIAL  
ANALYSTS' EVALUATION OF A COMPANY

by

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This dissertation, written by

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under the guidance of the faculty Committee,  
and approved by all its members, has been  
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## DEDICATION

Every doctoral candidate who has aspired to and attained the privilege to be called Doctor can appreciate the hardships involved in the quest. For some, the hardships are considerably more bitter. Many leave behind an important part of themselves; the price is high. There is, in fact, only one other person who can truly understand and experience every triumph, every disappointment, every tear as much as the candidates themselves. So it is to spouses of doctoral candidates everywhere--to those who endured--and to those who couldn't--that I would like to dedicate this dissertation as a very small token of collective appreciation for those hours, those years that you suffered with us; for the poverty, the depressions, and the small joys you shared--thank you; we will always remember.

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TABLE OF CONTENTS

	<u>Page</u>
DEDICATION. . . . .	ii
ACKNOWLEDGMENT. . . . .	iii
LIST OF TABLES. . . . .	vi
Chapter	
I. INTRODUCTION AND PROBLEM STATEMENT . . . . .	1
Introduction	
Purpose of the Research	
Importance of the Issue	
Recent Professional Pronouncements	
Current Reporting Environment	
Organization of the Dissertation	
II. THEORETICAL DEVELOPMENT AND LITERATURE REVIEW. . . . .	15
A Model of Human Information Processing	
Literature Review of the Use of Bayes's Theorem in Psychological and Accounting Research	
Information Load	
Summary	
III. RESEARCH DESIGN AND HYPOTHESES . . . . .	30
Overview	
Research Approach	
Research Design	
Independent Variables	
The Dependent Variables	
Operational Hypotheses	
The Task	
Subject Selection	
Sample Selection	
The Questionnaire	
Data Collection	
Pilot Study Results	
Summary	

	<u>Page</u>
IV. DATA AVAILABLE AND RESULTS. . . . .	48
Hypotheses	
Tests of Means	
Tests of Variance	
Bayesian Approach	
Between-Group Differences	
Statistical Tests on $H_{03}$ - Bayesian	
Test Results	
Statistical Tests on $H_{05}$	
Test Results	
The Classical Approach	
Between-Group Differences: $H_{01}$ , $H_{02}$	
Between-Group Differences: $H_{03}$	
Within-Group Difference	
Background Data	
Summary	
V. DISCUSSION, LIMITATIONS AND CONCLUSIONS. . . . .	91
Potential Interpretations of the Results	
Limitations	
REFERENCE LIST. . . . .	99
APPENDIXES. . . . .	110
A. Experimental Group 1 Questionnaire:	
Management's Report on Internal Control . . . . .	111
B. Experimental Group 2 Questionnaire:	
Management's Report on Internal Control	
and the Independent Accountant's Report . . . . .	126
C. Control Group Questionnaire:	
Unrelated Additional Information. . . . .	142

LIST OF TABLES

<u>Table</u>	<u>Page</u>
1. Questionnaire Distribution and Collection By Participating Organization. . . . .	42
2. Questionnaire Distribution and Collection By Treatment Group . . . . .	44
3. Between-Groups Corollary Hypotheses: Tests of Pretreatment Means. . . . .	51
4. Between-Groups Corollary Hypotheses: Tests of Posttreatment Means . . . . .	52
5. Between-Groups Corollary Hypotheses: Tests of Mean Differences. . . . .	53
6. Within-Groups Corollary Hypotheses: Tests of Mean Differences. . . . .	54
7. Between-Groups Corollary Hypotheses: Analysis of Variance . . . . .	55
8. <u>I</u> Tests of Likelihood Ratios: Experimental Group 1 (Management's Report on Internal Control) and the Control Group . . . . .	61
9. <u>I</u> Tests of Likelihood Ratios: Experimental Group 2 (Management's Report on Internal Control and the Independent Accountant's Report) and Control Group. . . . .	62
10. <u>I</u> Tests of Likelihood Ratios: Experimental Group 1 and Experimental Group 2 . . . . .	63
11. Test of Variance: Experimental Group 1 and Control Group. . . . .	67
12. Test of Variance: Experimental Group 2 and the Control Group. . . . .	68
13. Test of Variance: Experimental Group 1 and Experimental Group 2 . . . . .	69



<u>Table</u>	<u>Page</u>
14. <u>I</u> Test of Pretreatment Scores: Experimental Group 1 (Management's Report on Internal Control) and the Control Group. . . . .	72
15. <u>I</u> Test of Pretreatment Scores: Experimental Group 2 (Management's Report on Internal Control and the Independent Accountant's Report) and the Control Group. . . . .	73
16. <u>I</u> Test of Pretreatment Scores: Experimental Group 1 and Experimental Group 2 . . . . .	74
17. <u>I</u> Test of Posttreatment Scores: Experimental Group 1 (Management's Report on Internal Control) and the Control Group . . . . .	75
18. <u>I</u> Test of Posttreatment Scores: Experimental Group 2 (Management's Report on Internal Control and the Independent Accountant's Report) and the Control Group. . . . .	76
19. <u>I</u> Test of Posttreatment Scores: Experimental Group 1 and Experimental Group 2 . . . . .	77
20. <u>I</u> Test of Difference Scores: Experimental Group 1 (Management's Report on Internal Control) and the Control Group . . . . .	79
21. <u>I</u> Test of Difference Scores: Experimental Group 2 (Management's Report on Internal Control and the Independent Accountant's Report) and the Control Group. . . . .	80
22. <u>I</u> Test of Difference Scores: Experimental Group 1 and Experimental Group 2 . . . . .	81
23. <u>I</u> Tests of Within-Group Differences: Experimental Group 1 . . . . .	83
24. <u>I</u> Tests of Within-Group Differences: Experimental Group 2 . . . . .	84
25. <u>I</u> Tests of Within-Group Differences: Control Group. . . . .	85
26. Background Variables: Experimental Group 1 and Control Group. . . . .	88

Table

Page

27.	Background Variables: Experimental Group 2 and Control Group . . . . .	89
28.	Background Variables: Experimental Group 1 and Experimental Group 2 . . . . .	90

## CHAPTER I

### INTRODUCTION AND PROBLEM STATEMENT

#### Introduction

A controversial topic of current interest is the extension of the independent auditor's attest function to include the client company's system of internal accounting control. Expansion of the present auditor's report and/or inclusion in annual financial statements of supplemental reports on internal control would explicitly increase auditor responsibility (Uecker, 1977).

Of particular interest, and the subject of this study, is the recommendation to publish auditors' reports on internal control. This recommendation was made initially in the Report of Tentative Conclusions, by the Commission on Auditors' Responsibilities (CAR) and again in that group's final document, Report, Conclusions, and Recommendations (AICPA, 1977; 1978).

Requests for accounting-related data expansion are not a new phenomenon. The view of more data being better than less is held by both accountants and accounting information users and supports the events theory of accounting espoused by Sorter (1969) and others.

At various times users of financial statements have called for publication of different types of accounting information and even an extension of the auditor's attest function to cover the information requested. Financial forecasts, replacement cost data, price level adjusted financial statements, and social responsibilities are examples of recent requests for data expansion.

The underlying assumption of recommendations requesting more data and/or disclosure is that the increase in data is cost effective. That is, more benefit than cost will result from data expansion. If this assumption is erroneous, considerable resources for data production might be misapplied. Costs are typically far easier to determine than are benefits, which are frequently a matter of subjective estimate. The proposed research will not address cost issues but rather will attempt to assess the more elusive issue of benefit. Inferences regarding the benefits of proposed data expansion will be made based upon the impact this expansion has on expressed levels of confidence.

#### Purpose of the Research

The purpose of this research, therefore, is to determine whether the inclusion of either management's report on internal control or management's report on internal control and the independent auditor's opinion on

that report affects an individual's evaluation of a company as expressed by changes in levels of confidence in management's financial representations. That is, would the inclusion of reports on internal control with the traditional financial information and auditor's opinion cause individuals to make different judgments about a company than they would make based only upon their examination of the usual auditor's short form report and the company's financial statements?

The study will approach this question through an experiment which uses investment analysts as the subject group. These individuals have been chosen primarily because of their sophistication in accounting information utilization vis-a-vis other user groups, their substantial reliance on accounting information, and the influential role they play in economic resource allocation via their recommended investment decisions.

#### Importance of the Issue

The issue of publishing reports on internal control has received considerable attention recently in the professional accounting literature. The Commission on Auditors' Responsibilities (CAR) has stated:

There is a growing body of thought that users have a need to be informed, as part of adequate disclosure, about the condition of the internal controls. . . (American Institute of Certified Public Accountants [AICPA], 1977, p. 147).

In an attempt to inform financial statement users better, CAR suggested that both management and the external auditor should issue reports stating conclusions as to whether the accounting system and the accounting controls provide reasonable assurance that transactions have been authorized, assets are safeguarded, and the financial records are reliable for the preparation of financial statements.

Justification for CAR's conclusions was based largely on a limited telephone survey conducted by M. V. Brown (1977) that provides little empirical support for CAR's position. In her paper to CAR, Brown stated that only two of 27 interviewees had on occasion gained access to an auditor's management letter and therefore to comments on internal control. Also, many other interviewees displayed a very limited knowledge of the contents of the auditor's management letter. As Lea (1977, p. 5) points out, these results tend to refute rather than support CAR's position, since

. . . . it is difficult to understand how interviewees could have a strong need and demand for this information when they know very little about it in terms of its meaning, format and content.

A question might also be posed regarding the propriety of making recommendations for significant auditing reforms on the basis of the results of such surveys.

Lea's contention supports the American Institute of Certified Public Accountants (AICPA) position regarding published reports on internal control. Until recently, the AICPA opposed the issuance of reports on internal control to the public. The AICPA (1977a, p. 352) claimed:

. . . an auditor's report on his evaluation of internal accounting control would not provide any additional credibility to audited financial statements.

The AICPA has also questioned the "usefulness" of published reports on internal control to the general public. In its publication, Statements on Auditing Standards No. 1 (1977a, p. 350, section 640.03), the AICPA indicated that:

Because of the technical nature and complexity of internal accounting control and the consequent problem of understanding reports thereon, questions have been raised as to whether such reports serve a useful purpose for all persons for whom they might be issued. The usefulness of such reports depends on the understanding of the reports and on the action that can be taken by those to whom the reports are issued.

Although not prohibiting the issuance of reports on internal control with audited financial statements, the AICPA has suggested that management and regulatory agencies having jurisdiction bear the responsibility of determining the "usefulness" of such reports on a case by case basis. The issuance of an auditor's report on internal control with unaudited financial statements is prohibited under the assumption that such reports might result in unwarranted reliance on the unaudited statements. "Usefulness,"

however, has been identified as a user-related characteristic of information by several accounting research studies (see, for example, Mock, 1976; and American Accounting Association [AAA], 1966). AICPA standards imply that the preparer of information is in a better position to determine its usefulness than is the user. Although this is a realistic position from a pragmatic viewpoint, there is a growing body of literature and sentiment that suggests a need for higher levels of response to users' perceptions of their information requirements.

The long-held AICPA position appeared to be somewhat conservative in light of recent research studies and undoubtedly contributed to the increased criticism aimed at the accounting profession and to intervention of governmental agencies concerned with the public's protection. The AICPA has responded to these increased demands and has developed standards for reviews and reports on internal control (see pages 11 and 12).

#### Recent Professional Pronouncements

During 1977 the AICPA issued several Statements on Auditing Standards (SAS) pertinent to the auditor's expanded role in the system of corporate accountability, indicating greater perception of the changing environment the auditor faces. The first such SAS to be issued in that year was No. 16, "The Independent Auditor's Responsibility



for the Detection of Errors and Irregularities." This Statement provides guidelines on the auditor's responsibility for detecting errors or irregularities when examining financial statements.

Issued in the same month as SAS No. 16, SAS No. 17, "Illegal Acts by Clients," provides guidance for an auditor when client acts that appear to be illegal come to the auditor's attention.

"Client Representations," SAS No. 19, establishes a requirement that the auditor obtain certain written representations from management as a part of the examination of financial statements.

The importance of communicating weakness in internal control to senior management was explicitly addressed in SAS No. 20, "Required Communication of Material Weaknesses in Internal Control." This Statement establishes a requirement that the auditor communicate any material weakness in internal accounting control directly to senior management and the board of directors of the client company, or to the audit committee.

Identifying the boundaries of the audit function has plagued the public accounting profession for some time. Questions regarding the degree of responsibility auditors should take with respect to such issues as interim financial statements and management forecasts of earnings have been approached in isolation, and solutions have been

arrived at on an ad hoc basis rather than by the examination of an issue's relationship to the reporting process and the auditor's responsibilities toward it (AICPA, 1978, p. 56). This practice has obviously retarded the expansion of the independent auditor's role in reporting on internal accounting control.

The American Accounting Association's Committee on Basic Auditing Concepts has stated:

In the final analysis, any definition of the subject matter to which the auditing process might be applied is arbitrary and artificial. It is mostly tradition that has led us to the "economics" focus of auditing. In practice, the auditor's competence and the existence of operational criteria dictate the boundaries of the subject matter to be investigated. . . (1973, p. 5)

Others within the public accounting profession have also expressed concern for the needs of financial statement users to be provided with information on internal accounting controls. As early as 1961, Mautz and Sharaf stated that:

It appears entirely within reason to recommend that an independent auditor disclose to all concerned any weaknesses in internal control which in his opinion are sufficiently important to influence the judgment of one reading and acting on the financial statements. (p. 153)

The AICPA's Commission on Auditors' Responsibilities has given considerable attention to the responsibility of the public accounting profession to respond more fully to the demands of the business and investment communities. The Commission suggested that a significant step would be

to extend the boundaries of the audit function beyond the traditional financial statements by including an auditor's report on management's description of the internal accounting control system. The Commission recommended that management remain responsible as "originator and interpreter" of information while auditors should continue to provide objective evaluation of management's reporting obligations (AICPA, 1978, pp. 56-57).

This suggested division of responsibility between management and the auditor was underscored in a ruling by the Securities Exchange Commission (SEC) which dealt more generally with the responsibilities of management and the auditor:

The fundamental and primary responsibility for the accuracy of information filed with the Commission and disseminated among the investors rests upon management. Management does not discharge its obligations in this respect by employment of independent public accountants, however reputable. . . . [an auditor's opinion is] required not as a substitute for management's accounting of its stewardship, but as a check upon that accounting. (Securities Exchange Commission [SEC], 1947)

#### Current Reporting Environment

More recently, the United States Congress, prompted by illegal acts on the part of several company managements, adopted the Foreign Corrupt Practices Act of 1977 (FCPA), now Section 13(b) of the Securities Exchange Act of 1934. The FCPA, in Section 13(b)(2), deals directly with the issue of record keeping and internal accounting control.

Although not establishing new standards, the FCPA has provided impetus to the development of standards in this area by the public accounting profession.

In brief, the accounting provisions of the FCPA require that issuers of financial statements under the Securities and Exchange Act of 1934 must:

(A) make and keep books, records, and accounts, which, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the issuer; and

(B) devise and maintain a system of internal accounting controls sufficient to provide reasonable assurances that--

(i) transactions are executed in accordance with management's general or specific authorization;

(ii) transactions are recorded as necessary (I) to permit preparation of financial statements in conformity with generally accepted accounting principles or any other criteria applicable to such statements, and (II) to maintain accountability for assets;

(iii) access to assets is permitted only in accordance with management's general or specific authorization; and

(iv) the recorded accountability for assets is compared with the existing assets at reasonable intervals and appropriate action is taken with respect to any differences. (n.p.)

To enforce the FCPA, the SEC issued Release No. 34-15772 on April 30, 1979. This Release proposed rules for inclusion of a statement by management on internal accounting controls in certain filings with the SEC and in annual reports to stockholders. The Release

also stated that independent auditors would be required to report on management's statements.

The SEC's rule proposals met with substantial opposition from both management and independent accountants. Many believed that the Release had the effect of requiring a report on compliance with the law (the FCPA) rather than providing a medium for meaningful disclosure to investors. Complaints relating to the cost of compliance and the scope and content of the proposed management statement were also expressed. Still others pointed to the significant voluntary and private sector initiatives which were under way concerning internal control reporting.

One such initiative was Statement on Auditing Standards No. 30, "Reporting on Internal Accounting Control," issued in July of 1980. This Statement superseded SAS No. 1, Sections 640, "Reports on Internal Control," and 641, "Reports on Internal Control Based on Criteria Established by Governmental Agencies."

SAS No. 30 represented a significant modification of the position promulgated in SAS No. 1. SAS No. 30 provided guidance for independent accountants engaged to express an opinion on an entity's system of internal accounting control and for independent accountants who are reporting on internal accounting control based solely on a study and evaluation made as part of an audit. SAS No. 30,

importantly, did not reflect the distribution of the reports as did SAS No. 1.

On June 6, 1980, the SEC bowed, at least temporarily, to the pressures exerted by groups and individuals opposing its position. On the fear that it (the SEC) might preempt continued voluntary private-sector initiatives by promulgating formal legal requirements, the Commission issued Release No. 34-16877. The Release suspends the proposals to require reporting on internal accounting control until the SEC has had an opportunity to monitor continued voluntary, private-sector response through the Spring of 1982.

Recommendations to publish reports on internal control have been subjected to criticism by both academicians and professional accountants. Lea (1977, p. 6) criticized CAR's recommendations to publish reports on internal control, citing what he referred to as three major deficiencies:

1. The recommended comprehensive review of internal control by the auditor would significantly increase cost without a proven benefit to the user.

2. The precise nature and measurement standards of the auditor's comprehensive review have not yet been defined.

3. The recommended report does not appear to contain information useful to the external users of financial information.

Clearly, publication of auditors' reports on internal control is an emerging area of concern for preparers, attesters, and users of financial information. The question of whether, in fact, these reports are of benefit to external users of financial information remains unresolved. A solution, in part, is approached by the experiment in this study that isolates effects of published reports on internal control on users' levels of confidence in the reporting company's financial statements. The benefit of conducting such research prior to implementing policy decisions affecting financial reporting requirements should be obvious and has in fact been addressed in several recent papers (see, for example, Arnold, 1976; and May & Sundem, 1976). Diamond (1978) also pointed out the proclivity of the SEC to issue releases without ex-ante research upon which to base its accounting policy decisions.

This study directly tests the SEC's claim that

. . . information about the effectiveness of internal accounting control would enable investors to evaluate better the reliability of financial statements. . . as well as management's performance of its responsibilities to control the assets and transactions of the business. (SEC, 1980, p. 8606-2.266)

## Organization of the Dissertation

This chapter has discussed events that led to the SEC's recommending requirements for publishing reports on internal control, and the need for empirical research in this area. Chapter II presents a model of information processing and reviews the literature related to the issues discussed in this study. A research methodology and operational hypotheses are presented in Chapter III. Chapter IV provides an analysis of the data from the experiment, while Chapter V discusses the results, draws inferences and offers suggestions for future research.



## CHAPTER II

### THEORETICAL DEVELOPMENT AND LITERATURE REVIEW

#### A Model of Human Information Processing

Several models that specify the nature of human information processing (HIPS) have been suggested in both accounting and behavioral science literature. Driscoll and Mock (1976) outline a hierarchy of HIPS models, classifying them as either normative or descriptive in nature. The authors indicate, however, that the classification characteristics (i.e., normality or descriptivity) is not intrinsic to the models themselves but is based on "the manner in which the particular model is applied" (Driscoll & Mock, 1976, p. 7).

One such model that has proven useful in behavioral research and, more recently, in accounting research, is Bayes's theorem. The Bayesian Paradigm is based on a subjective or personalistic view of probability. Statistical inference is modification of an individual's opinions in light of new evidence, and Bayes's theorem specifies how such modifications should be made. Simply stated, Bayes's theorem provides a set of techniques for orderly expression and revision of opinions. The approach

provides a framework for explicitly working with payoffs of alternative courses of action, the prior knowledge of the decision maker, and formal modification of this knowledge as additional information becomes available.

A subjective interpretation of probability is the main distinctive feature of Bayesian statistics. Probability estimates elicited from individuals measure the confidence that an individual has in the truth of a particular proposition. The necessary and sufficient conditions for consistency in subjective probability estimation may be expressed as follows:

$$\begin{aligned} 0 \leq P(A) \leq P(S) = 1 \\ P(A \cup B) = P(A) + P(B), \end{aligned} \quad (1)$$

where  $S$  is the universal event,  $A$  and  $B$  are any two mutually exclusive events, and  $P(\cdot)$  is a subjective probability estimate.  $A \cup B$  represents the "union" of the events  $A$  and  $B$  and indicates the probability of either  $A$  or  $B$  occurring.

The Bayesian approach is distinctive in that subjective probabilities are not considered the "true" probabilities. Therefore, from this point of view, a probability assessment cannot be wrong, and all assessments are admissible as long as the individual believes that they correspond with his/her judgments.

Bayes's theorem has been used to compute conditional probabilities since 1763, when Reverend Thomas Bayes published his Essay Towards Solving a Problem in the Doctrine of Chance. The theorem now has a prominent place in modern statistical decision theory.

Bayes's theorem is of the form:

$$P(E_j|C) = \frac{P(C \cap E_j)}{P(C)} = \frac{P(C|E_j)P(E_j)}{\sum P(C|E_j)P(E_j)} \quad (2)$$

where  $P$  = a subjective probability estimate

$E_j$  = the occurrence of a particular event identified by the subscript  $j$

$|$  = given

$C$  = a particular piece of information

$\cap$  = the intersection--two or more occurrences happening together

$\sum$  = summation

Two types of subjective probabilities exist in the above formula: marginal and conditional. Marginal or prior probabilities are a set of mutually exclusive and collectively exhaustive events. They are probabilities that exist before any additional information is provided to a decision-maker.

The events  $E_j$  form a partition of a sample space; therefore, the sum of the probabilities of their occurrence will always equal 1.00. That is,

$$\sum_{j=1}^n P(E_j) = 1.00. \quad (3)$$

Conditional probabilities,  $P(C|E_j)$ , include the probabilities of receiving a particular piece of information (C), given that event  $E_j$  has occurred. The solution to a Bayesian problem is also expressed as a conditional probability (also known as a posterior probability because it represents a probability assessment which has been revised based upon the receipt of later information)(Ewart, Ford & Lin, 1974, p. 74).

Peterson, Schneider and Miller (1965, p. 522) present what is known as the odds form of Bayes's theorem as follows:

$$\frac{P(H_a|D)}{P(H_b|D)} = \frac{P(D|H_a)P(H_a)}{P(D|H_b)P(H_b)}, \quad (4)$$

or, more simply,

$$\Omega_1 = L\Omega_0, \quad (5)$$

where  $H_a$  and  $H_b$  = two different hypotheses

D = a relevant datum which occurs

$\Omega_0$  = the ratio of the prior probabilities of  $H_a$  to  $H_b$

$\Omega_1$  = the ratio of the posterior probabilities of  $H_a$  to  $H_b$

L = a likelihood which is the conditional probability of D given  $H_a$  divided by the conditional probability of D given  $H_b$

Edwards, Lindman and Savage (1963) provide a detailed discussion of these equations.

The order in which data are processed in an attempt to measure the impact of sequentially presented information makes no difference to the impact these data have on posterior probabilities. Slovic and Lichtenstein (1971, p. 667) have stated:

. . . The degree to which the prior odds change, upon receipt of new datum, is dependent upon the likelihood ratio for that datum. Thus, the likelihood ratio is an index of data diagnosticity or importance.

Subjects in an experiment using Bayes's theorem are generally requested to estimate prior and posterior probabilities. From these probabilities, a likelihood ratio is determined and compared with a likelihood ratio specified by Bayes's theorem. In this way, the normative Bayesian model can be used as a descriptive theory of human decision making behavior.

Libby and Lewis (1977, p. 254) point out that:

. . . the technique is particularly useful in assessing the impact of information set variables on cue usage and the deviations of the responses from optimality.

Kennedy (1975) employed Bayes's theorem to determine the usefulness of financial ratios to bankers in predicting bankruptcy. The study underscores the usefulness of Bayes's theorem in measuring cue usage. In his research, Kennedy indicated that the likelihood ratio for an item of information provides a dual measure of usefulness: (a) the impact of the information in terms of

magnitude on prior probabilities, and (b) the accuracy of the direction of the impact.

Literature Review of the Use of Bayes's Theorem  
in Psychological and Accounting Research

Much of the descriptive research undertaken in Bayesian applications has taken place in psychological studies and consists of comparing an individual's actual behavior with the normative model of Bayes's theorem. Typically, experiments on descriptive models provide a sample of data and ask subjects to estimate the proportion, mean, variance, etc. The difference between the estimates and the calculated statistics provide the measure of accuracy. The ultimate goal of this research is to develop a theory about human behavior in an uncertain environment (Peterson & Beach, 1967).

Research in accounting which has utilized Bayes's theorem has primarily approached the questions of information presentation, contextual effects, and characteristics of decision makers based upon the quality of their judgments. Quality is, again, determined by the difference between the outcome of a decision by a decision maker and that outcome obtained by the normative Bayesian rule (optimality) (Libby & Lewis, 1977, p. 255).

Several studies in behavioral decision theory have implied that Bayes's theorem is a reasonably good descriptive model of how people revise their subjective

probabilities based upon sample information. Peterson and Beach (1967, pp. 42-43) conclude that:

Experiments that have compared human inferences with those of statistical man show that the normative model provides a good first approximation for a psychological theory of inference. Inferences made by subjects are influenced by appropriate variables and in appropriate directions.

Although there is some evidence that man is not Bayesian in nature (Kahneman & Tversky, 1974, p. 450; Slovic & Lichtenstein, 1971, p. 714), people do appear to make decisions using rules similar to statistical rules such as unions and intersections in combining simple events (Chesley, 1975, p. 327). Several researchers (Root, 1975; Sanders, 1975) have found that subjective probability judgments tend to be better than actuarial probabilities for a number of different events.

Edwards (1968) and others have shown that although subjects revise their probabilities similarly to Bayes's theorem, they do not revise them to the same extent. Revisions by subjects tend to be more conservative, indicating that less than the optimal amount of information is extracted from a given datum. Several reasons have been suggested for these less optimal revisions. Peterson and Beach (1967) suggest that research into the causes of conservatism is important because this suboptimal behavior is systematic. This implies that if the reasons for conservatism can be found,

conservatism in responses may be eliminated, or at least the differences from optimum can be predicted.

Peterson, Schneider and Miller (1965) examined accuracy of data processing using Bayes's theorem. Their experiment measured the accuracy of subjective probability revisions as a function of sample size. Their results indicated that accuracy of processing decreases as sample size increases. Peterson and Swensson (1968) also concluded that when there are large amounts of data to be processed, subjects have difficulty in aggregating these data.

Many studies have attempted to determine whether the sequential order of data presentation adds to conservatism. Although the posterior probabilities computed with the normative Bayesian model are not affected by the order of sequential data presentation, Peterson and DuCharme (1967) and Phillips, Hays and Edwards (1966) suggest that the order does have an impact on subjects' probability revisions.

Studies have questioned whether information presented to subjects early or late in a sequence has greater impact. The results appear to be inconclusive. Peterson and DuCharme (1967) discovered a "primacy effect." That is, they determined that information presented early in a sequence had greater influence on probability revisions. Pitz and Reinhold (1968), on the other hand, have found a



"recency effect." A "recency effect" is said to exist when data presented later in the sequence are more influential.

Because conservatism has persisted in spite of variations in procedure, Peterson and Beach (1967, p. 33) have been inspired to state that:

[Conservatism]. . . has its roots in the fundamental aspects of subjects' understanding and use of information. . . subjects have an inaccurate understanding of sampling distributions.

Generally, three hypotheses as to the causes of conservatism are expounded and are the topic of much debate:

1. People misperceive the data's impact and therefore do not use correct likelihood ratios (Beach, 1966; Pitz & Downing, 1967).

2. People fail to aggregate likelihood ratios properly. That is, people have difficulty in putting together different pieces of data to arrive at a single response (Phillips & Edwards, 1966; Peterson & DuCharme, 1967; Peterson & Swensson, 1968). Edwards (1968) has suggested that, rather than estimating posterior probabilities, subjects should estimate likelihood ratios. A computer could then aggregate the  $P(D/H)$  estimates (Probability of a Datum given a Hypothesis) and compute the posterior probability. Edwards suggests that computer aggregation would provide revisions more closely approximating the normative Bayesian model. This type of

system is referred to as a Probabilistic Information Processing System (PIP).

3. An artificial or response bias effect has been suggested by DuCharme (1970). This hypothesis states that people, although capable and optimal while dealing within rather narrow limits of odds estimation, become conservative when forced to respond outside these ranges. People simply are unwilling to make extreme probability estimates.

Some evidence exists of a so-called "inertia effect" where subjects become increasingly resistant to change as the amount of information increases (Pitz & Reinhold, 1968). These authors found that subjects revised their posterior probabilities much less when evidence contradictory to their currently favored hypothesis was presented than they did when evidence was presented that supported their current beliefs.

Several examples of applications of the Bayesian model exist in accounting and related literature. Libby and Lewis (1977), in a review of the human information processing (HIP) literature, point out the frequency with which accountants have used the Bayesian paradigm to research problems in this area.

The potential of Bayesian statistical sampling procedures and their application to auditing has been well explored. The procedures have been approached by several

authors in attempts to demonstrate how audit efficiency can be increased by decreasing sample size to achieve a specified level of reliability (Ward, 1975; Corless, 1972, 1975; Knoblett, 1970; Smith, 1972; Tracy, 1969; and Sorenson, 1969). Blocher and Robertson (1976) have designed a computer-assisted instructional program to aid auditing instructors in teaching Bayesian statistical procedures.

Bierman (1975) applies Bayes's theorem to an audit choice problem to demonstrate how the optimal choice between auditing and not auditing a particular transaction could be obtained.

Scott (1976) examined the application of Bayesian decision theory to the problem of asset valuation and audit design and developed a normative model for auditors to address this problem. Scott (1977) also addressed a problem in auditing by using the Bayesian point estimation model, to deal with conditions of Arrow's Possibility theorem of group preference orderings. The overall conclusion of this work was that the model (because of its single peakedness) seems to be promising as a way to approach the many-user problem in accounting.

Felix (1976) asked auditors to assess their prior probabilities using techniques previously presented by Corless (1972) and Winkler (1967) in an attempt to evaluate the usefulness of these methodologies as probability

assessment methods. Felix concluded that statistical training was of considerable importance for individual auditors in their ability to assess their prior probabilities and also impacted on the techniques they employed. These results are consistent with those obtained by Schaefer and Borchering (1973).

Other studies (Peterson, DuCharme & Edwards, 1968) have concluded that subjects perform better (less conservatively) after training. This was hypothesized as a function of learning about the kinds of samples to expect from given populations.

Bayesian statistical techniques have been applied to stock and reorder decisions affecting inventory levels in many situations (Phillips & Dawson, 1975; Tsao, 1975). Typically these studies employ Bayesian point and/or interval estimation procedures to provide a basis on which these stocking decisions can be made.

Kennedy's study (1975) is one of the better examples in the accounting literature of an application of Bayes's theorem. This research demonstrates how the Bayesian paradigm can be used to determine the relative importance of information cues in the prediction of bankruptcy.

Barefield (1972), referring to the psychological literature on data presentation, hypothesized that better accounting decisions would be made if aggregated data rather than disaggregated data were presented. Barefield's

study concluded, however, that there was no significant effect of aggregation. Also, his analysis failed to show any significant effect of data redundancy on decision making success.

Dickhaut (1973) investigated the effects of single and joint information systems, hypothesizing that the single information system would provide better results because of the difficult task of data reduction associated with the joint system. Bayes's theorem was used to calculate the results. The results indicated that the single information system did allow decision makers to perform better. The measure of performance that was employed was the average absolute difference between the subjects' probability estimates and the Bayesian probability estimate.

#### Information Load

For some time, psychologists and organizational behavioralists have recognized the potentially undesirable effects of increasing quantities of information in decision-making settings (Cyert & March, 1963; Katz & Kahn, 1966; Ackoff, 1967). Early tests on information load (Hoffman & Blanchard, 1961; Hayes, 1964; Golden, 1964; Hunt & Walker, 1966; Soskin, 1965) indicated little relationship between information load increases and predictive accuracy.

More recently, studies have found that increasing information load decreases decision quality, increases response variability, and increases decision-maker confidence (Einhorn, 1971; Hogarth, 1975; Jacoby, 1975; Payne, 1976). Schroder, Driver and Streufert (1967) attempted to relate information load and the complexity of information processing. Revsine (1970) referenced this theory to suggest the possibility of overload resulting from data expansion as proposed by "events" theorists and suggested that user decision models were necessary to identify information needs. Birnberg (1975) suggested that increasing information load is not necessarily the appropriate response to user needs.

Several accounting studies have emphasized the need to consider environmental, behavioral and task variables before recommending specific information loads (see, for example, Dermer, 1973; Miller & Gordon, 1975; Barefield, 1972; Driver & Mock, 1975). Studies on information load generally do not rigorously define the term; therefore, what constitutes high or low levels is a decision left to the researcher.

Clearly, the literature indicates that at some point, increasing the quantity of information becomes dysfunctional to the decision process (information overload). Therefore, requiring the issuance of reports

on internal control may not be a desirable course of action.

#### Summary

This chapter has reviewed a number of relevant studies that serve as a point of departure for this research. The use of the Bayesian information processing model in both accounting and psychology was the major area of literature surveyed. A number of studies discussed the appropriateness of the Bayesian model in both a normative and a descriptive sense. The most relevant conclusion that can be drawn from these studies is that people do process information in a manner similar to that of Bayes's theorem and that the model has proven very useful in determining the degree of cue usage in the decision process. This model was used in this study to determine the degree to which security analysts changed their levels of confidence in financial statements.

## CHAPTER III

### RESEARCH DESIGN AND HYPOTHESES

#### Overview

This study is a field experiment in which financial analysts were asked to make a series of assessments based on five years' financial statements of a selected company. The financial analysts were randomly assigned to three treatment groups.

#### Research Approach

The most promising research approach to the questions posited by this study appeared to be a field experiment.

Kerlinger (1973, p. 401) indicates:

. . . A field experiment is a research study in a realistic situation in which one or more independent variables are manipulated by the experimenter under as carefully controlled conditions as the situation will permit.

The field experiment provides several conceptual advantages and is especially well-suited to the proposed study because of the pragmatic nature of the research questions. Kerlinger (1973, p. 402) states, "The effects of a field experiment are often strong enough to penetrate the distractions of experimental situations." Most notable is the restrictive and artificial environment typically found



in laboratory settings. Kerlinger continues, "the principle is, the more realistic the research situation, the stronger the variables."

Kerlinger (1973, pp. 402-403) outlines the strengths of the field experiment as follows:

1. Provides relatively strong control of extraneous variables.

2. Allows for (a) manipulation of independent variables, and (b) use of randomization techniques.

3. Provides greater realism of the field situation and creates a stronger impact by the independent variables on the dependent variable.

4. Is well-suited to both testing theory and the solution of practical problems.

The major weaknesses of field experiments appear to be operational in nature. That is, although theoretically variable manipulation and randomization can be achieved, practically they may not be feasible. Also, full cooperation from and motivation of subjects might be difficult to achieve; thus, the experiment results might be biased.

Ex post facto research methodologies, such as case or field studies, correlational, and causal-comparative research designs, were not appropriate alternatives because of the lack of published internal control reports. Survey

methodology, although a promising alternative, would not provide an unbiased measure of the impact of published reports on internal control--the objective of this study. A laboratory experiment could have been utilized to address the research, probably with increased control. However, this approach was rejected in favor of the increased external validity provided by the field experiment. The difference between laboratory experiments and field experiments is not in fact always clear and is frequently determined by the degree of control achieved over the independent variables.

Clearly, other research designs can make valuable contributions. In fact, the strengths of one design often counterbalance the weaknesses of another. Several research designs might have to be employed in future research before definitive conclusions are reached regarding the impact of published reports on internal control.

#### Research Design

The experimental design chosen to address the study's research hypotheses is referred to by Kerlinger (1973, p. 331) as an "Experimental group - Control group design with randomized subjects." This is a repeated measure design which provides control of independent variables and satisfies many internal validity claims. The design takes the form:

		Treatment				
R	$X_1$	$Y_1$	$X_2$			(Experimental <sub>1</sub> )
	$X_1$	$Y_1$	$X_2$	$+ X_3$	$Y_2$	(Experimental <sub>2</sub> )
	$X_1$	$Y_1$	$X_4$		$Y_2$	(Control)

where the capital R enclosed in a box indicates that the subjects have been randomly assigned to the two experimental groups (top lines) and to the control group<sup>1</sup> (bottom line). To reduce further the possibility of extraneous, systematic variance, the experimental treatment was assigned to the groups randomly. This further increased internal validity.

#### Independent Variables

The symbols  $X_1$ ,  $X_2$ ,  $X_3$ , and  $X_4$  refer to manipulated independent variables. In this study,  $X_1$  represents a five-year summary of operations, a five-year summary of changes in financial position, and a balance sheet for the last two years. In addition, the auditor's standard short-form report on the last two years was presented. The financial statements are those which are usually typical of those presented in annual reports to stockholders.

$X_2$  refers to management's report on internal control, and  $X_3$  symbolizes the auditor's opinion on management's report on internal control.

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<sup>1</sup>This group may alternatively be referred to as an experimental group because of the placebo treatment. However, the purpose of this group is the control of the general information effect.

$X_4$  symbolizes a manipulatable variable, which was used to isolate and reduce between-groups variance due principally to general information effects. More specifically,  $X_4$  represents "empty" information; that is, information which had no relevance to firm evaluation but was provided to control for general information effects. A short discussion of the differences between inferential and descriptive statistics was presented to provide the desired placebo effect.

The financial statements presented to each group in the experiment ( $X_1$ ) were those of a "Fortune's Five Hundred Company" whose annual report was chosen because of characteristics of presentation which provided greater clarity of form. Also, no strong trends in operating results were present. The Company's name was masked in the experiment to eliminate any preconceptions on the part of subjects with respect to the Company's operations, management, and, most importantly, internal controls.

#### The Dependent Variables

$Y_1$  represents a series of seven questions adapted from a study conducted by Mautz (1977) regarding the criteria used by financial analysts to evaluate a company's performance. Although many of the specific criteria suggested by the Mautz study were not included in the seven questions representing  $Y_1$ , the Mautz conclusions were used

to help structure the questions in  $Y_1$  regarding financial position and results of operations.

As mentioned earlier, this study uses a repeated measure design.  $Y_1$  represents the before treatment test;  $Y_2$  represents the after treatment test.

Using Bayesian terminology, the prior probabilities are solicited with  $Y_1$  and the posterior probabilities are solicited with  $Y_2$ . Therefore,  $Y_2$  consists of the same series of seven questions as  $Y_1$ . The differences between these measures will indicate the impact a particular treatment had on subject response.

#### Operational Hypotheses

The information load literature reviewed in Chapter II provides a basis for concluding that increased information load will increase user confidence levels. Therefore, the following hypotheses were developed to test whether reports on internal control issued by either management or management and the independent auditors increase confidence in management's financial statements:

$H_{01}$ : There is no difference in the level of confidence expressed on the financial statements among the three groups based on the pretreatment scores.

H<sub>02</sub>: There is no difference in the level of confidence expressed on the financial statements among the three groups as a result of the reports on internal control based on the posttreatment scores.

H<sub>03</sub>: There is no difference in the degree of revision of confidence levels expressed among the three groups as a result of the receipt of the reports on internal accounting control as measured by pretreatment and posttreatment difference scores.

H<sub>04</sub>: There is no difference in the degree of revision of confidence levels expressed within the three groups as a result of the reports on internal control.

H<sub>05</sub>: There is no difference in the consistency of confidence level revisions expressed among the three groups as a result of the receipt of the reports on internal control.

Within each of these general hypotheses, the study addressed differences between and within groups as to confidence in specific estimates of profitability and financial condition.

### The Task

The experiment began by providing the subjects in each group with an identical set of instructions. The stimulus material consisted of  $X_1$ , described previously. The financial statements did not disclose strong trends and therefore should have maximized the impact of additional information.

After analyzing the information presented to them, each group responded to a questionnaire so that levels of confidence in the financial statements could be measured. These measurements were employed to compare with subsequent measures on the same variables to determine changes in levels of confidence that took place as a result of new information.

The experiment continued by providing Experimental Group 1 with an unqualified management report on internal control. The report form chosen was that form suggested by Ernst & Whinney (1979, p. 6). This report is presented in Appendix B. No form for management's report on internal control has as yet been recommended by the SEC. The report's content is at issue as well. The SEC has solicited comments regarding such questions as: Should management's report on internal control be signed and by whom? Should the report include (1) a discussion of the concept of reasonable assurance, and (2) disclosure of the

basis for the management opinion and a description of the evaluation approach?

In addition, the SEC is considering recommendations made by the Commission on Auditors' Responsibilities, the Financial Executives Institute, and the AICPA, such as: Should the reports include:

- A statement of management's responsibility for the financial statements, including the judgments and estimates involved and the selection of appropriate generally accepted accounting principles?
- A description of the work of the company's audit committee and internal auditors?
- A discussion of the role of the company's independent auditors?

Each change in format and/or content could, theoretically, provide a different signal to the user of financial information and might therefore be the subject of a separate research study. The information provided to Experimental Group 2 consisted of  $X_2$  and the auditor's unqualified, short form report on internal control ( $X_3$ ). Again, since form and content have not yet been authoritatively established, the shorter, unqualified auditor's report was utilized for reasons identical to those that led to the selection of the short form, unqualified management report on internal control--to



increase the impact of experimental differences. The report is presented in Appendix B.

### Subject Selection

As mentioned in Chapter I, investment analysts were selected as the subjects in the experiment. Tradeoffs are often encountered in the selection of subjects, and this study provides no exception. The professional literature on internal control generally supports the philosophy that the average investor does not possess the ability to understand internal control and its relationship to audited financial statements. For this reason, subjects with significantly more experience and expertise in the evaluation of financial statements and related information provided considerably more insight into the conclusions of the study. Certainly, the use of financial analysts increases the external validity of the research results.

A less acceptable alternative would have been to use larger numbers of less sophisticated subjects. Students, an often-selected group, are typically available in large numbers, but their lack of sophistication brings the resultant external validity into question.

The research questions at hand are pragmatic and were asked of those in a position best suited to respond to them--individuals who are capable of understanding the

questions and the task and those most likely to use the information in a "real-world" setting.

### Sample Selection

Generally, there are two alternative approaches that could be employed in the selection of subjects to take part in a research study. Specifically, a random sample of financial analysts who are members of the Financial Analysts Federation, the nation-wide association of financial analysts, could be selected. The selected sample of financial analysts would then be mailed questionnaires. There are, however, several problems associated with this approach which make it unattractive.

There is a general loss of experimental control from selecting a blind sample, especially one with large geographical dispersion, as would be the case in a truly random sample of the Financial Analysts Federation. In many cases, dependent on task complexity and other factors, subjects lack motivation in completing the task. This tends to increase the inherently low response rates and non-response bias frequently encountered in blind samples. Financial analysts are regarded, as a group, to be notoriously poor at responding to mail surveys. This view was supported in a pilot study conducted to test the questionnaire.

A question now arises as to what population(s) will be sampled. Generally the population to be sampled is financial analysts in Southern California. Each of the three treatment groups is a sample of all potential subjects given that treatment. Hays (1973, p. 402) states, "Each treatment group is a sample from a potential population of observations made under that treatment." He continues:

The sample space is conceived as the set of all possible treatment-subject combinations, and the statistical relationship itself is defined in terms of this sample space. (p. 413)

Therefore, statistics applied to the three samples are done so in an attempt to estimate the characteristics of "potential" populations.

For the reasons mentioned above, the blind sample approach was rejected in favor of a more direct solicitation of local Societies of the Federation of Financial Analysts and securities research firms.

Two methods were used to obtain the desired levels of cooperation from financial analysts. Three local chapters of the Financial Analysts Federation were contacted to sponsor participation of their respective memberships in the study. One chapter, the Financial Analysts Society of San Diego, agreed to allow distribution of the questionnaires at one of their meetings. Response rates from this group are shown in Table 1. Six major California

Table 1  
 Questionnaire Distribution and Collection  
 By Participating Organization

<u>Organization</u>	<u>Number Distributed</u>	<u>Number Returned</u>	<u>Percentage Returned</u>
The Financial Analysts Society of San Diego	30	11	36.67
Firm 1	13	11	84.62
Firm 2	8	4	50.00
Firm 3	17	14	82.35
Firm 4	8	7	87.50
Firm 5	14	12	85.71
Firm 6	<u>12</u>	<u>10</u>	<u>83.33</u>
Totals	<u>102</u>	<u>69</u>	<u>67.65</u>

investment banking houses employing eight or more financial analysts also agreed to participate in the study. Although those firms participating wish to remain anonymous, they were located in the Los Angeles area. Most of the research directors of the firms participating agreed to distribute the questionnaires in their interoffice mail with a letter sanctioning the study and requesting participation of the individual financial analyst. As a result, the response rate for these firms was very high (see Table 1).

Approximately 67.65% of the questionnaires were returned. A higher return rate was experienced in those firms participating in the study than in the Financial Analysts Society of San Diego, presumably because of the follow-up opportunities for the directors of research in those organizations. Table 2 shows the return rate on a group basis.

#### The Questionnaire

Three sets of questionnaires were used in the study: a different questionnaire for each of the two experimental groups and one for the control group (see Appendix A for a copy of each of the questionnaires). The questionnaires were identical in all respects except that one experimental group received as additional information, management's statement of its responsibility for internal accounting control, while the second experimental group received

Table 2  
 Questionnaire Distribution and Collection  
 By Treatment Group

<u>Group</u>	<u>Number Distributed</u>	<u>Number Returned</u>	<u>Percentage Returned</u>
<u>Experimental Group 1:</u> Management's Report on Internal Control	40	23	57.5
<u>Experimental Group 2:</u> Management's Report on Internal Control and the Independent Accountant's Report	31	24	77.42
<u>Control Group:</u> Unrelated Additional Information	<u>31</u>	<u>22</u>	<u>70.97</u>
Totals	<u>102</u>	<u>69</u>	<u>67.65</u>

management's statement and a report by the independent Certified Public Accountants indicating the adequacy of the client company's management system of internal controls. The control group received additional information unrelated to the task, in order to control for general information effects.

Each questionnaire consisted of a cover letter explaining in general terms that the study was an attempt to measure the importance of accounting information in decision-making, an introduction to the task, the experimental task, and a set of background questions.

A set of background questions was developed to test for possible differences between treatment groups on such demographic variables as age, level of education, work experience, and degree of investment research undertaken.

#### Data Collection

Information gained in the pilot study indicated that a much higher response rate would probably be attained if the questionnaires were distributed through cooperating research directors than through the use of a blind mail sample. The cooperating firms agreed to distribute the questionnaires. For five of the participating firms, in order to maintain the anonymity of the individual financial analysts participating in the study, the questionnaires were returned directly to the researcher. A

self-addressed, stamped envelope was distributed with each questionnaire. The research director in the sixth firm insisted on both distributing and collecting the questionnaires, which were all returned to the researcher. Each of the organizations participating was given all three sets of questionnaires, and these were assigned randomly to the financial analysts.

All of the questionnaires were distributed early in June, 1980, and returned by late July, 1980.

#### Pilot Study Results

A pilot study was conducted to test the questionnaires and to determine the adequacy of the independent variables. The results of the pilot study indicated the method of distribution most appropriate to ensure a reasonable response would be directly through the research director of cooperating firms. Also, the participants suggested the clarification of two questions and the addition of one background question related to degree of research involvement. The pilot study did indicate that the questions were appropriate and the questionnaire adequately designed.

#### Summary

This chapter discussed the research methodology developed for this study. A field experiment was employed in which financial analysts participated. The experimental



design consisted of a repeated measure, experimental-control group design with randomized subjects.

Independent and dependent variables were selected and submitted to a pilot test. Appropriate changes were made. A set of research hypotheses was developed that were used to test the major questions addressed by this study.

## CHAPTER IV

### DATA ANALYSIS AND RESULTS

The primary purpose of Chapter IV is to analyze the results of the field experiment. As noted in previous chapters, the objective of the analysis is to determine the impact, if any, of additional information on internal control on the confidence levels financial analysts express in traditional financial statements. This chapter consists of four sections. The first section analyzes the results of the field experiment using the odds form of Bayes's theorem, while the second section approaches the analysis using the more traditional classical approach. Section three provides an analysis of demographic variables to determine whether any important differences exist in these variables between treatment groups. The fourth section compares the results of both Bayesian and classical analyses and presents a summary of the chapter.

#### Hypotheses

The general aggregate hypotheses presented in Chapter III and being treated here follow.

## Tests of Means

### Pretreatment Scores:<sup>2</sup>

H<sub>01</sub>: There is no difference in the level of confidence expressed on the financial statements among the three groups based on the pretreatment scores.

### Posttreatment Scores:<sup>2</sup>

H<sub>02</sub>: There is no difference in the level of confidence expressed on the financial statements among the three groups as a result of the reports on internal control based on the posttreatment scores.

### Difference Scores:

H<sub>03</sub>: There is no difference in the degree of revision of confidence levels expressed among the three groups as a result of the receipt of the reports on internal accounting control as measured by pre-treatment and posttreatment difference scores.

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<sup>2</sup>Pretreatment scores are confidence level measures before the treatment and posttreatment scores are identical measures after the treatment.

H<sub>04</sub>: There is no difference in the degree of revision of confidence levels expressed within the three groups as a result of the reports on internal control.

#### Tests of Variance

H<sub>05</sub>: There is no difference in the consistency of confidence level revisions expressed among the three groups as a result of the receipt of the reports on internal control.

To test these general assertions, each of the seven questions regarding the levels of confidence of financial analysts was examined independently as a separate detailed hypothesis. Therefore, the aggregate null hypotheses, directly addressed by question one of the study, were reexamined in questions two through seven by assessing a more specific impact on measures of profitability, financial condition, and certain management responsibilities generally associated with the objectives of internal control. These corollary hypotheses for all seven questions are presented in Table 3 for the pretest between-groups test of means, Table 4 for the posttest between-groups test of means, Table 5 for the between-groups test of mean differences, Table 6 for the between-groups variance analysis, and Table 7 for the within-groups test of mean differences.

Table 3

Between-Groups Corollary Hypotheses: Tests of Pretreatment Means

Question  
Number

Corollary Null Hypotheses,  $H_{01}$ :

- 1 There is no difference in the levels of confidence expressed by the experimental groups and the control group as to fair presentation of the financial statements.
- 2 There is no difference in the levels of confidence expressed by the experimental groups and the control group as to the income statement fairly reporting the results of operations.
- 3 There is no difference in the levels of confidence expressed by the experimental groups and the control group as to the income statement presenting a realistic representation of management's ability to utilize resources effectively.
- 4 There is no difference in the levels of confidence expressed by the experimental groups and the control group as to the balance sheet fairly reporting financial position.
- 5 There is no difference in the level of confidence expressed by the experimental groups and the control group as to the balance sheet representing how well management safeguarded assets.
- 6 There is no difference in the level of confidence expressed by the experimental groups and the control group as to whether management maintained an adequate system of internal control.
- 7 There is no difference as to the willingness to invest between the experimental groups and the control group.

Table 4

Between-Groups Corollary Hypotheses: Tests of Posttreatment Means

Question  
Number

Corollary Null Hypotheses, H<sub>02</sub>:

- 1 There is no difference in the levels of confidence expressed by the experimental groups and the control group as to fair presentation of the financial statements.
- 2 There is no difference in the levels of confidence expressed by the experimental groups and the control group as to the income statement fairly reporting the results of operations.
- 3 There is no difference in the levels of confidence expressed by the experimental groups and the control group as to the income statement presenting a realistic representation of management's ability to utilize resources effectively.
- 4 There is no difference in the levels of confidence expressed by the experimental groups and the control group as to the balance sheet fairly reporting financial position.
- 5 There is no difference in the level of confidence expressed by the experimental groups and the control group as to the balance sheet representing how well management safeguarded assets.
- 6 There is no difference in the level of confidence expressed by the experimental groups and the control group as to whether management maintained an adequate system of internal control.
- 7 There is no difference as to the willingness to invest between the experimental groups and the control group.

Table 5

Between-Groups Corollary Hypotheses: Tests of Mean Differences

Question  
Number

Corollary Null Hypotheses, H<sub>03</sub>:

- 1 There is no difference in the levels of confidence expressed by the experimental groups and the control group as to fair presentation of the financial statements.
- 2 There is no difference in the levels of confidence expressed by the experimental groups and the control group as to the income statement fairly reporting the results of operations.
- 3 There is no difference in the levels of confidence expressed by the experimental groups and the control group as to the income statement presenting a realistic representation of management's ability to utilize resources effectively.
- 4 There is no difference in the levels of confidence expressed by the experimental groups and the control group as to the balance sheet fairly reporting financial position.
- 5 There is no difference in the level of confidence expressed by the experimental groups and the control group as to the balance sheet representing how well management safeguarded assets.
- 6 There is no difference in the level of confidence expressed by the experimental groups and the control group as to whether management maintained an adequate system of internal control.
- 7 There is no difference as to the willingness to invest between the experimental groups and the control group.

Table 6

Within-Groups Corollary Hypotheses: Tests of Mean Differences

Question  
Number

Corollary Null Hypotheses,  $H_{04}$ :

- 1 There is no difference in the revision of confidence expressed by the experimental groups and the control group as to fair presentation of the financial statements.
- 2 There is no difference in the revision of confidence expressed by the experimental groups and the control group as to the income statement fairly reporting the results of operations.
- 3 There is no difference in the revision of confidence expressed by the experimental groups and the control group as to the income statement presenting a realistic representation of management's ability to utilize resources effectively.
- 4 There is no difference in the revision of confidence expressed by the experimental groups and the control group as to the balance sheet fairly reporting financial position.
- 5 There is no difference in the revision of confidence expressed by the experimental groups and the control group as to the balance sheet representing how well management safeguarded assets.
- 6 There is no difference in the revision of confidence expressed by the experimental groups and the control group as to whether management maintained an adequate system of internal control.
- 7 There is no difference in the revision of confidence expressed by the experimental groups and the control group as to their willingness to invest.



Table 7

Between-Groups Corollary Hypotheses: Analysis of Variance

Question  
Number

Corollary Null Hypotheses, H<sub>05</sub>:

- 1 There is no difference between the experimental groups and the control groups in the consistency with which levels of confidence were revised as to fair presentation of the financial statements.
- 2 There is no difference between the experimental groups and the control groups in the consistency with which levels of confidence were revised as to the income statement fairly reporting the results of operations.
- 3 There is no difference between the experimental groups and the control groups in the consistency with which levels of confidence were revised as to the income statement presenting a realistic representation of management's ability to utilize resources effectively.
- 4 There is no difference between the experimental groups and the control groups in the consistency with which levels of confidence were revised as to the balance sheet fairly reporting financial position.
- 5 There is no difference between the experimental groups and the control groups in the consistency with which levels of confidence were revised as to the balance sheet representing how well management safeguarded assets.
- 6 There is no difference between the experimental groups and the control groups in the consistency with which levels of confidence were revised as to whether management maintained an adequate system of internal control.
- 7 There is no difference between the experimental groups and the control groups in the consistency with which levels of confidence were revised as to their willingness to invest.

### Bayesian Approach

The classical Bayesian model presented in Chapter II is repeated here.

$$P(E_j|C) = \frac{P(C|E_j)P(E_j)}{\sum P(C|E_j)P(E_j)}$$

This model has been used in both normative and descriptive research studies to calculate a posterior or revised subjective probability. This is accomplished by soliciting both prior and conditional probabilities from subjects and calculating the posterior probabilities. These calculated probabilities are then compared to a solicited posterior probability to determine whether the decision model used by the subject was Bayesian. That conclusion could be drawn if there was no significant difference between the calculated and solicited posterior probabilities.

Research studies in both psychology and accounting (see Chapter II) have also used the odds form of Bayes's theorem in which both the prior and posterior probabilities are solicited and a likelihood ratio is computed. The odds form of Bayes's theorem (from Chapter II) is expressed:

$$\Omega_1 = L\Omega_0$$

where  $\Omega_1$  is the posterior probability,  $L$  is the likelihood ratio and  $\Omega_0$  is the prior probability.

An example might help explain the mathematics. Assume that we solicit a subjective estimate of the degree of confidence an individual has that a particular income

statement fairly presents the operating results of the company for which it was issued. If this measure of confidence is solicited as a subjective probability that is expressed as a value from 0 to 1.0, we have obtained an assessment of a "prior" probability. Assume the level of confidence expressed by our hypothetical subject is .70.

Our subject is now exposed to additional information that may or may not, in the subject's opinion, have an effect on the subject's original assessment of confidence in the financial statement previously presented. Let's ask the subject what that impact of the additional information was. This is not done directly, but is accomplished, rather, by asking the subject to reassess the original (prior) estimate of the level of confidence. Let us assume, further, that the subject's reassessment indicated that the confidence level had changed; it had increased to .80. This is known as the subject's "posterior" probability.

From the prior and posterior probabilities just obtained from our subject, we can compute the likelihood ratio as follows:

$$\Omega_1 = L\Omega_0.$$

In our example:

$$.80 = L.70, \text{ or}$$

$$L = \frac{.80}{.70}. \text{ Therefore,}$$

$$L = 1.142857.$$

The impact of the additional information is determined by the difference between the value of its likelihood ratio (in this case, 1.142857) and one. If the likelihood ratio equaled one, the item of information had no impact on prior odds. With prior probabilities stated, say, in favor of  $H_1$ , the likelihood ratio for an item of information (a particular report on internal control) is greater than one, when the item is more probable given  $H_1$  is true. The larger the value of the likelihood ratio, the greater is the impact of the item of information. When an item of information is more probable given  $H_2$ , the likelihood ratio is positive and less than one.

#### Between-Group Differences

In the analysis that follows, a likelihood ratio was computed for seven questions (dependent variables) in each of the three groups in the study. This provided a measure of the between-groups differences attributed principally to the effect of the treatment ( $X_2$ ,  $X_3$ , or  $X_4$ ).

The likelihood ratio was computed by dividing the aftertreatment measure of confidence for each question (expressed as variables V8 through V14) by the corresponding beforetreatment measure (expressed as variables V1 through V7). This was done for each of the three groups on a subject by subject basis. The means of each of these new variables (expressed as L1 through L7) were then compared between groups.

### Statistical Tests on $H_{03}$ - Bayesian

Hypotheses  $H_{03}$  (Table 5) were tested using a t test of differences between means. The analysis was done with the aid of SPSS-Statistical Package for the Social Sciences (SPSS) t-test programs (Nie, et al., 1975, pp. 267-275).

As Hays (1973, pp. 409-410) notes, two statistical assumptions are generally made to justify the use of the t distribution. They are that: (1) the populations sampled are normal, and (2) the population variances are homogeneous. Hays indicates, however, that "in practical situations, these assumptions are sometimes violated with rather small effect on the conclusions" (p. 410). With regard to the assumption of normality, Hays states (p. 410), "This assumption may be violated almost with impunity, provided the sample size is not extremely small." Although the assumption of homogeneity of variance appears to be more important, Hays concludes (p. 410) that, "for samples of equal size, relatively big differences in the population variances seem to have relatively small consequences for the conclusions derived from the t test." Samples of unequal size do, however, present a problem. A correction is suggested by an adjustment to the degrees of freedom. The adjustment is also used when equal population variances cannot be assumed. This adjustment process was incorporated into the SPSS t-test programs. Although different sample sizes were obtained in the three groups

tested in this study, the sample size differences are not considered large enough to have a serious effect on the conclusions of the t tests.

The t statistics used were computed by SPSS, using the following formulas:

1. Populations with Unequal Variances:

$$\underline{t} = \frac{(\bar{X}_1 - \bar{X}_2) - (\mu_1 - \mu_2)}{S_1^2/n_1 + S_2^2/n_2} \quad (6)$$

This statistic is not distributed as Student's t, but can be approximated by adjusting the degrees of freedom as follows:

$$\underline{df} = \frac{[(S_1^2/n_1) + (S_2^2/n_2)]}{[(S_1^2/n_1)^2/(n_1 - 1)] + [(S_2^2/n_2)^2/(n_2 - 1)]} \quad (7)$$

2. Populations with Equal Variances:

$$t_{\underline{d}} = \frac{(\bar{X}_1 - \bar{X}_2)}{S_{\underline{d}}} \quad (8)$$

with  $(n_1 + n_2 - 2)$  degrees of freedom.

The SPSS program estimated the population variances, and based on the significance of the F statistic, either of the above formulas was used to compute t.

### Test Results

The results of the between-groups differences are summarized in Tables 8, 9, and 10. As can be seen, in all but one case it is impossible to reject the null hypotheses at any conventional level of significance (for example,

Table 8

I Tests of Likelihood Ratios: Experimental Group 1  
(Management's Report on Internal Control) and the Control Group

<u>Variable Number</u>	<u>Variable Name</u>	<u>Group 1</u>		<u>Control Group</u>		<u>I Value</u>	<u>Significance</u>
		<u>Mean</u>	<u>Standard Deviation</u>	<u>Mean</u>	<u>Standard Deviation</u>		
L1	Financial statements are fairly presented.	1.0445	.180	.9842	.164	-1.17	.247
L2	The income statement fairly reports the results of operations.	1.1040	.260	1.0170	.183	-1.29	.203
L3	The income statement is a realistic representation of management's ability to use resources effectively.	1.1960	.370	.9095	.294	-2.87	.006
L4	The balance sheet fairly reports financial position.	1.1393	.232	1.0315	.173	-1.76	.085
L5	The balance sheet represents how well management safeguarded assets.	1.1377	.262	.9985	.331	-1.57	.124
L6	Management maintained an adequate system of internal control.	1.5393	1.825	1.1369	.571	-1.01	.323
L7	Willingness to invest.	1.0368	.486	.8464	.385	-1.45	.154

Table 9

T Tests of Likelihood Ratios: Experimental Group 2 (Management's Report on Internal Control and the Independent Accountant's Report) and Control Group

Variable Number	Variable Name	Group 2		Control Group		I Value	Significance
		Mean	Standard Deviation	Mean	Standard Deviation		
L1	Financial statements are fairly presented.	1.0132	.160	.9842	.164	-.61	.547
L2	The income statement fairly reports the results of operations.	1.0964	.263	1.0170	.183	-1.18	.245
L3	The income statement is a realistic representation of management's ability to use resources effectively.	1.1786	.497	.9095	.294	-2.21	.033
L4	The balance sheet fairly reports financial position.	1.0274	.244	1.0315	.173	.06	.949
L5	The balance sheet represents how well management safeguarded assets.	1.4826	1.279	.9985	.331	-1.79	.085
L6	Management maintained an adequate system of internal control.	1.4383	1.508	1.1369	.571	-.91	.370
L7	Willingness to invest.	1.1055	1.073	.8464	.385	-1.11	.277



Table 10

I Tests of Likelihood Ratios: Experimental Group 1 and Experimental Group 2

<u>Variable Number</u>	<u>Variable Name</u>	<u>Group 1</u>		<u>Group 2</u>		<u>T Value</u>	<u>Significance</u>
		<u>Mean</u>	<u>Standard Deviation</u>	<u>Mean</u>	<u>Standard Deviation</u>		
L1	Financial statements are fairly presented.	1.0445	.180	1.0132	.160	.63	.532
L2	The income statement fairly reports the results of operations.	1.040	.260	1.0964	.263	.10	.921
L3	The income statement is a realistic representation of management's ability to use resources effectively.	1.1960	.370	1.1786	.497	.14	.892
L4	The balance sheet fairly reports financial position.	1.1393	.232	1.0274	.244	1.61	.115
L5	The balance sheet represents how well management safeguarded assets.	1.1377	.262	1.4826	1.279	-1.29	.208
L6	Management maintained an adequate system of internal control.	1.5393	1.825	1.4383	1.508	.21	.837
L7	Willingness to invest.	1.0368	.486	1.1055	1.073	-.28	.778

$\alpha = .01$ ). In the t test between Experimental Group 1 and the control group for Variable L3, "confidence that the income statement is a realistic representation of management's ability to use resources effectively," a t statistic of -2.87 with an  $\alpha$  of .006 was obtained. This would suggest that the subjects in Experimental Group 1 were impacted, at least selectively, by the addition of management's report on internal control. Interestingly, the statistically significant difference was noted on a question associating internal control with the income statement implying a belief, perhaps, that the primary effect of adequate internal controls was to provide management with a better opportunity to use resources at their disposal effectively to produce profits.

#### Statistical Tests on $H_{05}$

This hypothesis and the corollary hypotheses listed in Table 7 relate to the consistency with which individuals revised their confidence level estimates based upon the additional information.

Several statistical tests are available to test the variance of the confidence level revisions made by the three groups. This study uses a test suggested by Hays (1973, p. 450). The hypotheses are tested using the following statistic:

$$F = \frac{S^2 \text{ larger}}{S^2 \text{ smaller}}$$

These tests were conducted with the SPSS programs (Nie, et al., p. 270). One possible difficulty associated with interpreting the results of the F test is the normal distribution assumption associated with inferences about population variances. The F test cannot be safely used for variance hypotheses ". . . unless the population distribution is normal or the sample sizes are quite large" (Hays, 1973, p. 451).

The obvious implication of this notion is that the samples in this study were drawn from three populations of financial analysts that were normally distributed as to their understanding of the concept of internal control. Kerlinger and Pedhauzer (1973, p. 47) indicate, however, that:

It has convincingly been shown that F and T tests are strong or robust statistics which means that they resist violations of the assumptions.

Since random sampling techniques were not employed, the assumptions take on relatively less importance. However, this researcher believes the assumption of normality in the parent populations in this study is reasonable.

### Test Results

Tables 11, 12, and 13 display the results of the tests of variance. Notice that the tests indicated that six different F tests were significant at the  $\alpha = .01$  level. Interestingly, the only variables affected were L5, L6, and L7. On the test between Experimental Group 1 and the control group, L6, "confidence that management maintains an adequate system of internal control," provided an F statistic of 10.21 and significance beyond .001. The added information provided Experimental Group 1 seems to have increased the variability of the responses to that question. (The likelihood-ratio tests of means between these two groups for this question did not produce a significant t statistic.) This result implies confusion or at least a great lack of consensus on the part of the members of Experimental Group 1 as a result of being provided with management's statement on their responsibility for internal control. The group subjects clearly were not able to interpret the implication of this additional information.

When compared with the control group, Experimental Group 2 displayed significant differences on three variables. Variables L5, L6, and L7 each displayed significance beyond the  $\alpha = .001$  level with F statistics of 14.93, 6.97, and 7.77, respectively. Apparently, the impact of the addition of the independent accountant's report to management's report on internal control added to

Table 11

Test of Variance: Experimental Group 1 and Control Group

<u>Variable Number</u>	<u>Variable Name</u>	<u>Degrees of Freedom</u>	<u>F Value</u>	<u>Significance</u>
L1	Financial statements are fairly presented.	22, 21	1.20	.673
L2	The income statement fairly reports the results of operations.	22, 21	2.04	.108
L3	The income statement is a realistic representation of management's ability to use resources effectively.	22, 21	1.58	.297
L4	The balance sheet fairly reports financial position.	22, 21	1.79	.187
L5	The balance sheet represents how well management safeguarded assets.	22, 21	1.60	.284
L6	Management maintained an adequate system of internal control.	22, 21	10.21	.000
L7	Willingness to invest.	22, 21	1.60	.288

Table 12

Test of Variance: Experimental Group 2 and the Control Group

<u>Variable Number</u>	<u>Variable Name</u>	<u>Degrees of Freedom</u>	<u>F Value</u>	<u>Significance</u>
L1	Financial statements are fairly presented.	23, 21	1.04	.915
L2	The income statement fairly reports the results of operations.	23, 21	2.08	.096
L3	The income statement is a realistic representation of management's ability to use resources effectively.	23, 21	2.86	.018
L4	The balance sheet fairly reports financial position.	23, 21	1.99	.119
L5	The balance sheet represents how well management safeguarded assets.	23, 21	14.93	.000
L6	Management maintained an adequate system of internal control.	23, 21	6.97	.000
L7	Willingness to invest.	23, 21	7.77	.000

Table 13

Test of Variance: Experimental Group 1 and Experimental Group 2

<u>Variable Number</u>	<u>Variable Name</u>	<u>Degrees of Freedom</u>	<u>F Value</u>	<u>Significance</u>
L1	Financial statements are fairly presented.	22, 23	1.26	.589
L2	The income statement fairly reports the results of operations.	22, 23	1.02	.961
L3	The income statement is a realistic representation of management's ability to utilize resources effectively.	22, 23	1.81	.171
L4	The balance sheet fairly reports financial position.	22, 23	1.11	.811
L5	The balance sheet represents how well management safeguarded assets.	22, 23	23.81	.0000
L6	Management maintained an adequate system of internal control.	22, 23	1.46	.370
L7	Willingness to invest.	22, 23	4.86	.0000

the confusion or a lack of consensus on two additional variables. Of even greater interest is the results of the F tests between the two experimental groups. These tests disclosed two differences significant at an  $\alpha$  greater than .001. The F statistic for L5 was 23.81 and for L7, 4.86. The implication of these results is clear: The independent accountant's report on internal control further increased the variability of the confidence estimates. The accountant's report also further increased the difficulty of assessing the impact of the additional information on internal accounting control.

Contrary to the SEC's assertion of the need by the public for information on internal control, the results from this section of the experiment indicate that presentation of internal control reports did not cause subjects to report greater confidence in the financial statements presented. However, the reports on internal control did cause greater variability in subject responses. There are several possible reasons for this increased variability, and their exploration is the subject of Chapter V of this study.

#### The Classical Approach

Both between-group and within-group differences were tested using more traditional analysis techniques.



Between-Group Differences:  $H_{01}$ ,  $H_{02}$

T tests were performed on each the pretreatment and posttreatment scores as between groups. The results of the t tests for the pretreatment scores are presented in Tables 14, 15, and 16, and the results of the t tests of posttreatment scores may be found in Tables 17, 18, and 19.

The t tests of the posttreatment scores indicated several significant differences between groups. More specifically, variables V3, V4, V5, V6, and V7 for differences between Experimental Group 1 and the control group (see Table 17) and variables V5, V6, and V7 for differences between Experimental Group 2 and the control group (see Table 18).

These differences would be quite significant if one could be assured that they were caused as a result of the treatment. However, by using only posttreatment scores for the analysis, one is unable to determine whether the differences exist as a result of the treatment or as a result of some other confounding factor.

One possible confounding factor is differences that existed as a matter of chance between the participants in each of the three groups. If we review the pretreatment scores and significant differences that exist on the same variables, it may be safe to conclude that posttreatment differences existed in the pretreatment scores and were therefore not a result of the treatment.

Table 14

T Test of Pretreatment Scores: Experimental Group 1  
(Management's Report on Internal Control) and the Control Group

<u>Variable Number</u>	<u>Variable Names</u>	<u>Group 1</u>		<u>Group 2</u>		<u>T Value</u>	<u>Significance</u>
		<u>Mean</u>	<u>Standard Deviation</u>	<u>Mean</u>	<u>Standard Deviation</u>		
V1	Confidence that financial statements are fairly presented.	.7452	.165	.6432	.153	-2.15	.037
V2	Confidence that the income statement fairly reports the results of operations..	.7196	.187	.6295	.186	-1.62	.113
V3	Confidence that the income statement represents management's ability to use resources effectively.	.5991	.177	.4750	.236	-2.00	.052
V4	Confidence that the balance sheet fairly reports financial position.	.6930	.145	.5932	.146	-2.31	.026
V5	Confidence that the balance sheet represents how well management safeguarded assets.	.6443	.171	.4009	.190	-4.53	.000
V6	Confidence that management maintained an adequate system of internal control.	.6665	.198	.4591	.203	-3.46	.001
V7	Willingness to invest.	.4591	.267	.1486	.166	-4.66	.000

Table 15

T Test of Pretreatment Scores: Experimental Group 2 (Management's Report on Internal Control and the Independent Accountant's Report) and the Control Group

Variable Number	Variable Names	<u>Group 2</u>		<u>Control Group</u>		<u>T Value</u>	<u>Significance</u>
		<u>Mean</u>	<u>Standard Deviation</u>	<u>Mean</u>	<u>Standard Deviation</u>		
V1	Confidence that financial statements are fairly presented.	.7137	.156	.6432	.153	-1.54	.130
V2	Confidence that the income statement fairly reports the results of operations.	.6912	.166	.6295	.186	-1.19	.241
V3	Confidence that the income statement represents management's ability to use resources effectively.	.5929	.228	.4750	.236	-1.72	.093
V4	Confidence that the balance sheet fairly reports financial position.	.7196	.162	.5932	.146	-2.78	.008
V5	Confidence that the balance sheet represents how well management safeguarded assets.	.5912	.223	.4009	.190	-3.10	.003
V6	Confidence that management maintained an adequate system of internal control.	.5725	.278	.4591	.203	-1.57	.124
V7	Willingness to invest.	.3187	.166	.1486	.275	-2.51	.016

Table 16

T Test of Pretreatment Scores: Experimental Group 1 and Experimental Group 2

<u>Variable Number</u>	<u>Variable Names</u>	<u>Group 1</u>		<u>Group 2</u>		<u>T VaTue</u>	<u>Significance</u>
		<u>Mean</u>	<u>Standard Deviation</u>	<u>Mean</u>	<u>Standard Deviation</u>		
V1	Confidence that financial statements are fairly presented.	.7452	.165	.7137	.156	.67	.505
V2	Confidence that the income statement fairly reports the results of operations.	.7196	.187	.6912	.166	.55	.586
V3	Confidence that the income statement represents management's ability to use resources effectively.	.5991	.177	.5929	.228	.10	.918
V4	Confidence that the balance sheet fairly reports financial position.	.6930	.145	.7196	.162	- .59	.556
V5	Confidence that the balance sheet represents how well management safeguarded assets.	.6443	.171	.5912	.223	.91	.367
V6	Confidence that management maintained an adequate system of internal control.	.6665	.198	.5725	.278	1.33	.190
V7	Willingness to invest.	.4591	2.67	.3187	.275	1.77	.083

Table 17

I Test of Posttreatment Scores: Experimental Group 1 (Management's Report on Internal Control) and the Control Group

<u>Variable Number</u>	<u>Variable Names</u>	<u>Group 1</u>		<u>Control Group</u>		<u>T Value</u>	<u>Significance</u>
		<u>Mean</u>	<u>Standard Deviation</u>	<u>Mean</u>	<u>Standard Deviation</u>		
V1	Confidence that financial statements are fairly presented.	.7661	.161	.6373	.183	-2.51	.016
V2	Confidence that the income statement fairly reports the results of operations.	.7687	.161	.6364	.197	-2.48	.017
V3	Confidence that the income statement represents management's ability to use resources effectively.	.6948	.201	.4636	.288	-3.13	.003
V4	Confidence that the balance sheet fairly reports financial position.	.7678	.120	.6045	.164	-3.82	.000
V5	Confidence that the balance sheet represents how well management safeguarded assets.	.7191	.185	.3941	.207	-5.56	.000
V6	Confidence that management maintained an adequate system of internal control.	.7839	.142	.4705	.220	-5.71	.000
V7	Willingness to invest.	.4787	.259	.1582	.202	-4.61	.000

Table 18

I Test of Posttreatment Scores: Experimental Group 2 (Management's Report on Internal Control and the Independent Accountant's Report) and the Control Group

<u>Variable Number</u>	<u>Variable Names</u>	<u>Mean</u>	<u>Standard Deviation</u>	<u>Mean</u>	<u>Standard Deviation</u>	<u>T Value</u>	<u>Significance</u>
V1	Confidence that financial statements are fairly presented.	.7158	.166	.6373	.183	-1.53	.134
V2	Confidence that the income statement fairly reports the results of operations.	.7342	.158	.6364	.197	-1.87	.068
V3	Confidence that the income statement represents management's ability to use resources effectively.	.6404	.257	.4636	.288	-2.20	.033
V4	Confidence that the balance sheet fairly reports financial position.	.7271	.188	.6045	.164	-2.34	.024
V5	Confidence that the balance sheet represents how well management safeguarded assets.	.7012	.181	.3941	.207	-5.37	.000
V6	Confidence that management maintained an adequate system of internal control.	.7521	.173	.4705	.220	-4.85	.000
V7	Willingness to invest.	.3758	.304	.1582	.202	-2.83	.007

Table 19

T Test of Posttreatment Scores: Experimental Group 1 and Experimental Group 2

<u>Variable Number</u>	<u>Variable Names</u>	<u>Group 1</u>		<u>Group 2</u>		<u>T Value</u>	<u>Significance</u>
		<u>Mean</u>	<u>Standard Deviation</u>	<u>Mean</u>	<u>Standard Deviation</u>		
V1	Confidence that financial statements are fairly presented.	.7661	.161	.7158	.166	1.05	.298
V2	Confidence that the income statement fairly reports the results of operations.	.7687	.161	.7342	.158	.74	.461
V3	Confidence that the income statement represents management's ability to use resources effectively.	.6948	.201	.6404	.257	.81	.425
V4	Confidence that the balance sheet fairly reports financial position.	.7678	.120	.7271	.188	.88	.384
V5	Confidence that the balance sheet represents how well management safeguarded assets.	.7191	.185	.7012	.181	.34	.739
V6	Confidence that management maintained an adequate system of internal control.	.7839	.142	.7521	.173	.69	.495
V7	Willingness to invest.	.4787	.259	.3758	.304	1.24	.220

The repeated measures design provides controls that were not invoked in testing  $H_{01}$  and  $H_{02}$ . The  $t$  tests of  $H_{03}$  that follow incorporate these added controls by allowing each group's pretreatment score to act as a control over its posttreatment scores, thereby isolating the treatment effect.

Between-Group Differences:  $H_{03}$

A  $t$  test was performed on the difference scores of the pretest and posttest means for each dependent variable on a group-by-group basis to test  $H_{03}$  again (see Table 5). The results are presented in Tables 20, 21, and 22. The difference scores are a far better measure of the impact of the additional information than are the mean differences of the posttest scores alone. The difference scores indicate the degree to which confidence levels were changed by the additional information, while posttest scores between groups might disclose significant differences simply because of differences in pretest scores or starting confidence levels. Therefore this test provides added controls to isolate the treatment effect.

The results of the  $t$  tests indicate that the null hypotheses suggested in Table 5, that is,  $H_{03}$  and corollary hypotheses, cannot be rejected. No significant differences occurred as a result of the different research treatments.



Table 20

I Test of Difference Scores: Experimental Group 1 (Management's Report on Internal Control) and the Control Group

<u>Variable Number</u>	<u>Variable Name</u>	<u>Group 1</u>		<u>Control Group</u>		<u>T Value</u>	<u>Significance</u>
		<u>Mean</u>	<u>Standard Deviation</u>	<u>Mean</u>	<u>Standard Deviation</u>		
D1	Financial statements are fairly presented.	.0209	.120	-.0059	.088	-.85	.399
D2	The income statement fairly reports the results of operations.	.0491	.127	.0068	.079	-1.33	.190
D3	The income statement is a realistic representation of management's ability to use resources effectively.	.0957	.169	-.0114	.092	-2.65	.012
D4	The balance sheet fairly reports financial position.	.0748	.090	.0114	.082	-2.47	.017
D5	The balance sheet represents how well management safeguarded assets.	.0748	.125	-.0068	.144	-2.03	.049
D6	Management maintained an adequate system of internal control.	.1174	.222	.0114	.182	-1.76	.086
D7	Willingness to invest.	.0196	.159	.0095	.043	-.29	.773

Table 21

T Test of Difference Scores: Experimental Group 2 (Management's Report on Internal Control and the Independent Accountant's Report) and the Control Group

Variable Number	Variable Name	Group 1		Control Group		T Value	Significance
		Mean	Standard Deviation	Mean	Standard Deviation		
D1	Financial statements are fairly presented.	.0021	.101	-.0059	.088	-.28	.777
D2	The income statement fairly reports the results of operations.	.0429	.137	.0068	.079	-1.08	.287
D3	The income statement is a realistic representation of management's ability to use resources effectively.	.0475	.212	-.0114	.092	-1.24	.225
D4	The balance sheet fairly reports financial position.	.0075	.148	.0114	.082	.11	.912
D5	The balance sheet represents how well management safeguarded assets.	.1100	.203	-.0068	.144	-2.33	.031
D6	Management maintained an adequate system of internal control.	.1796	.262	.0114	.182	-2.55	.015
D7	Willingness to invest.	.0571	.114	.0095	.043	-1.90	.067

Table 22

T Test of Difference Scores: Experimental Group 1 and Experimental Group 2

<u>Variable Number</u>	<u>Variable Name</u>	<u>Group 1</u>		<u>Group 2</u>		<u>T Value</u>	<u>Significance</u>
		<u>Mean</u>	<u>Standard Deviation</u>	<u>Mean</u>	<u>Standard Deviation</u>		
D1	Financial statements are fairly presented.	.0209	.120	.0021	.101	- .58	.564
D2	The income statement fairly reports the results of operations.	.0491	.127	.0429	.137	- .16	.873
D3	The income statement is a realistic representation of management's ability to use resources effectively.	.0957	.169	.0475	.212	- .86	.395
D4	The balance sheet fairly reports financial position.	.0748	.090	.0075	.148	-1.87	.068
D5	The balance sheet represents how well management safeguarded assets.	.0748	.125	.1100	.203	.71	.479
D6	Management maintained an adequate system of internal control.	.1174	.222	.1796	.262	.88	.386
D7	Willingness to invest.	.0196	.159	.0571	.114	.92	.361

### Within-Group Difference

To determine whether subjects (within different treatment groups) revised their estimates of confidence to any significant degree as a result of the treatment, a paired samples  $t$  test was used. The  $t$  statistic used was computed by the following formula:

$$t = \frac{\bar{d} - \delta}{S_{\bar{d}}} \quad (9)$$

where:

$\bar{d}$  = the sample mean of the difference scores

$\delta$  = the mean of normally distributed variable  $D$

$D = X_1 - X_2$

$X_1$  = a measurement before treatment

$X_2$  = a measurement after treatment

$$S_{\bar{d}} = \sqrt{\left[ S_1^2 + S_2^2 - \frac{2\sum X_1 X_2}{n-1} \right] / n}$$

$S^2$  = sample variance

The purpose of pairing is to reduce the effect of subject to subject variability; that is, extraneous influences on the variable being measured

(Nie, et al., 1975, p. 270).

The hypotheses tested here are referred to collectively as  $H_{04}$  (see Table 6). As noted in Tables 23, 24, and 25, there were some significant differences on some of the variables tested, notably in Experimental Group 1 and 2. Although there were revisions of confidence levels in the

Table 23

T Tests of Within-Group Differences: Experimental Group 1

<u>Variable Number</u>	<u>Variable Name</u>	<u>Before Treatment</u>	<u>After Treatment</u>	<u>T Value</u>	<u>Significance</u>
V1, V8	Confidence that financial statements are fairly presented.	.7452	.7661	- .84	.413
V2, V9	Confidence that the income statement fairly reports the results of operations.	.7196	.7687	-1.85	.078
V3, V10	Confidence that the income statement represents management's ability to use resources effectively.	.5991	.6948	-2.72	.013
V4, V11	Confidence that the balance sheet fairly reports financial position.	.6930	.7678	-3.97	.001
V5, V12	Confidence that the balance sheet represents how well management safeguarded assets.	.6443	.7191	-2.88	.009
V6, V13	Confidence that management maintained an adequate system of internal control.	.6665	.7839	-2.54	.019
V7, V17	Willingness to invest.	.4591	.4787	- .59	.561

Table 24

T Tests of Within-Group Differences: Experimental Group 2

<u>Variable Number</u>	<u>Variable Name</u>	<u>Before Treatment</u>	<u>After Treatment</u>	<u>T Value</u>	<u>Significance</u>
V1, V8	Confidence that financial statements are fairly presented.	.7137	.7158	- .10	.921
V2, V9	Confidence that the income statement fairly reports the results of operations.	.6912	.7342	-1.53	.140
V3, V10	Confidence that the income statement represents management's ability to use resources effectively.	.5929	.6404	-1.10	.284
V4, V11	Confidence that the balance sheet fairly reports financial position.	.7196	.7271	- .25	.806
V5, V12	Confidence that the balance sheet represents how well management safeguarded assets.	.5912	.7012	-2.66	.014
V6, V13	Confidence that management maintained an adequate system of internal control.	.5725	.7521	-3.36	.003
V7, V17	Willingness to invest.	.3187	.3758	-2.45	.023

Table 25

T Tests of Within-Group Differences: Control Group

<u>Variable Number</u>	<u>Variable Names</u>	<u>Before Treatment Mean</u>	<u>After Treatment Mean</u>	<u>T Value</u>	<u>Significance</u>
V1, V8	Confidence that financial statements are fairly presented.	.6432	.6373	.32	.756
V2, V9	Confidence that the income statement fairly reports the results of operations.	.6295	.6364	- .40	.690
V3, V10	Confidence that the income statement represents management's ability to use resources effectively.	.4750	.4636	.58	.571
V4, V11	Confidence that the balance sheet fairly reports financial position.	.5932	.6045	- .65	.520
V5, V12	Confidence that the balance sheet represents how well management safeguarded assets.	.4009	.3941	.22	.827
V6, V13	Confidence that management maintained an adequate system of internal control.	.4591	.4705	- .29	.772
V7, V17	Willingness to invest.	.1486	.1582	-1.05	.306

control group, none was determined to be significant. Experimental Group 2 displayed a significant revision at the  $\alpha = .01$  level on variable V6, "confidence that management maintained an adequate system of internal control." Experimental Group 1 had significant revisions for V4 ( $\alpha = .001$ ) and V5 ( $\alpha = .009$ ). Both of these variables are balance sheet oriented, implying perhaps a belief of stronger association of internal controls with that financial statement.

Although both of the experimental groups increased their confidence levels on selected variables, only one of the differences was significant enough to cause a between-group difference reported previously in this chapter. Apparently then, each treatment group revised its confidence estimates to some degree; the revisions generally, however, were not great enough to cause differences between the treatment groups.

#### Background Data

The questionnaires contained four background questions. These demographic variables included questions about the participant's age, level of education, work experience, and number of years employed as a financial analyst. The background variables were included in the study to test for differences between treatment groups on demographic variables that may have affected the experimental results.



The results of the t tests performed between groups on these variables are presented in Tables 26 through 28. As can be seen, there were no significant differences on these demographic variables.

#### Summary

In this chapter, the data from the field experiment were analyzed using both Bayesian and Classical approaches. Neither approach disclosed differences in the means, either on a within-groups or on a between-groups basis. Differences were noted, however, in the variability of scores between groups, indicating a lack of consensus as to the meaning of the reports on internal control.

Background variables were investigated, and this researcher concluded that the individuals who participated in this study were experienced financial analysts with high levels of education. Although there was a high degree of diversity in the backgrounds of the participants, no significant differences between treatments developed.

Table 26.

Background Variables: Experimental Group 1 and Control Group

<u>Variable Number</u>	<u>Variable Name</u>	<u>Experimental Group One</u>			<u>Control Group</u>			<u>T Value</u>	<u>Significance</u>
		<u>Minimum</u>	<u>Maximum</u>	<u>Mean</u>	<u>Minimum</u>	<u>Maximum</u>	<u>Mean</u>		
V15	Age	22	62	40.087	25	56	42.636	.84	.403
V17	Number of Companies Investigated	0	1,200	263.609	3	1,000	292.591	.27	.786
V18	Years Employed	1	30	11.783	1	25	12.091	.12	.903

Table 27

Background Variables: Experimental Group 2 and Control Group

<u>Variable Number</u>	<u>Variable Name</u>	<u>Experimental Group Two</u>			<u>Control Group</u>			<u>T Value</u>	<u>Significance</u>
		<u>Minimum</u>	<u>Maximum</u>	<u>Mean</u>	<u>Minimum</u>	<u>Maximum</u>	<u>Mean</u>		
V15	Age	23	64	41.958	25	56	42.636	-.23	.820
V17	Number of Companies Investigated	1	850	108.565	3	1,000	292.591	-2.04	.05
V18	Years Employed	.25	30	13.75	1	25	12.091	.66	.515

Table 28

Background Variables: Experimental Group 1 and Experimental Group 2

<u>Variable Number</u>	<u>Variable Name</u>	<u>Experimental Group One</u>			<u>Experimental Group Two</u>			<u>T Value</u>	<u>Significance</u>
		<u>Minimum</u>	<u>Maximum</u>	<u>Mean</u>	<u>Minimum</u>	<u>Maximum</u>	<u>Mean</u>		
V15	Age	22	62	40.087	23	64	41.9583	.58	.566
V17	Number of Companies Investigated	0	1,200	263.6087	3	1,000	108.5652	-1.95	.059
V18	Years Employed	1	30	11.7826	.25	30	13.75	.77	.445

## CHAPTER V

### DISCUSSION, LIMITATIONS AND CONCLUSIONS

This chapter contains three sections. In the first section, the results and implications of the field experiment are discussed. The second section discusses the limitations of the study and the final section deals with possible areas of future research.

One of the primary events leading to the passage of the FCPA was the disclosure on the part of several hundred U.S. corporations of questionable overseas payments. These questionable overseas payments were often not properly recorded or reported by the accounting systems. As a result, investors and the U.S. Congress were concerned that the integrity of corporate financial statements had been compromised. The accounting provisions of the FCPA were therefore intended to prevent the recurrence of failures in internal accounting controls.

A significant motive for the legislation (FCPA) was then to reassure investors that management had control of all company operations and that financial statements were indeed credible (Sorter et al., 1978).

The Securities Exchange Commission attempted to enforce the FCPA by requiring company managements and independent accountants to issue reports on internal accounting control. The SEC indicated it believed that the benefits of such information exceeded its costs and that the information would enable investors to evaluate better the reliability of the financial statements and management's performance. These remarks were not, however, based upon empirical evidence but rather on subjective perceptions of user needs.

The results of this research provide empirical evidence contrary to the SEC's position. Neither the additional information of management's report on internal accounting control and the independent accountant's report nor simply management's report alone had any statistically significant effect on changes in confidence levels about financial statement reliability.

#### Potential Interpretations of the Results

Acceptance of this study's research hypotheses regarding mean group differences in confidence levels might suggest that the SEC employ an alternative approach to enforce the FCPA. This research found that confidence in management's financial representations was not increased by issuing reports on internal control; therefore, one may conclude that the suggested reaffirmation of investor

confidence in the credibility of financial statements has not been achieved in this study as a result of issuing reports on internal accounting control. In fact, results obtained from examination of posttreatment variances imply that the reports on internal control did more to confuse than to enlighten the subjects.

Although the term "confusion" might not be appropriate, one may safely conclude that the variance of Experimental Group 1 was significantly larger, from a statistical perspective, than was the variance of the Control Group for variable L6. The subjects in Experimental Group 1 could not reach consensus on the impact of the additional information. The question represented by variable L6 is "How confident are you that management maintains an adequate system of internal control?"

The tests of variance between Experimental Group 2 (independent accountant's report along with management's report) revealed an even greater lack of consensus. Differences between variables L5 and L7 in addition to L6 proved to be statistically significant. These results indicate that addition of the independent accountant's report increased the variability of the responses.

The variances of the two experimental groups proved to be statistically different as well for variables L5 and L7. The variances of Experimental Group 2 were significantly larger, indicating that when the independent accountant's

report was provided in addition to management's report, subjects were not able to concur on the impact of this report on their levels of confidence regarding the financial statements.

Clearly, one may conclude that both management's report on internal control and the independent accountant's report have some information content. Subjects could not agree however how this added information impacted their personal confidence in the financial statements.

There are several possible explanations for the significant variance differences. Behavioral studies have shown (Driscoll & Mock, 1976, pp. 39-40) that individuals are impacted differently by information because of different decision models and different perceptions and degrees of understanding regarding the additional information. Also, the task, evaluation of reports on internal control, was unfamiliar to the subjects. Increased familiarity with the relationship between internal accounting control and the financial statements might result in very different conclusions regarding the impact of such reports.

Financial analysts may already be considering the impact of internal accounting control on the financial statements. These investors may believe that the auditor's



unqualified report implies a strong system of internal accounting control exists and is operating effectively.

Another possible explanation of the results may be that requirements to publish reports on internal accounting control are too recent and tentative. Financial analysts have not yet had an opportunity to learn of the relationship between different forms of the auditor's report, financial statements, and internal accounting control.

The possibility of information overload should also be considered when interpreting the results of this study. There are limits to the amounts of information that individuals can process effectively. When these limits are reached, information beyond this point creates an information overload condition.

Information processors deal with this condition differently. Individuals may choose to ignore some information and deal only with that information with which they feel more comfortable. Driscoll and Mock (1976, pp. 39-40) refer to this as a frame of reference phenomenon wherein an individual's implicit decision model will be used to determine which information is relevant and irrelevant for a particular judgment

A number of psychological studies have indicated that humans are not efficient information processors (see Chapter III). Therefore, time may be required to respond

to additional accounting information. Ashton (1976, p. 16) has found some indication of functional fixation in accounting contexts, indicating that considerable time may be necessary for individuals to react effectively to additional information.

The study has implications for accounting policy formulation and points to the need for ex-ante research prior to decisions relating to the cost vs. benefit of additional disclosures. The benefit of the additional information in this study is doubtful, since subjects did not change their confidence in the financial statements. Assumably therefore the resource allocation process would not have been impacted by the additional disclosures. Although the cost issue was not addressed, reactions from management and independent accountants indicate that it will be significant. If other studies find similar relationships existing between costs and benefits, the SEC's position regarding the required disclosures should be reconsidered.

#### Limitations

Issues regarding internal and external validity of statistical results often create tradeoffs. Research methodologies are examined and selected based upon compromises to conditions specific to the research question and setting. Such tradeoffs had to be made in this study.

External validity limitations exist because the selection of subjects was not accomplished using random sampling techniques. The entire population of financial analysts was not used as a base from which to choose participants. Therefore the degree to which the results of this study may be generalized to other samples of financial analysts is limited.

Internal validity may also be questioned because of the experimental task. Although the task was constructed to be as realistic as possible, duplication of analysis and decision setting is impossible in a study such as this. Consequently, the results in a real-world setting with its increased complexities may very well be different from those found in this study.

As financial analysts become more familiar with internal accounting controls, their reactions to reports thereon may change. The lack of knowledge regarding internal accounting controls on the impact of the participants therefore may also have led to limitations in the internal validity of the study. As the education process continues, subsequent replications of this study could provide different results.

There are several areas of future research which are suggested by this dissertation. The most obvious would be a replication of this study using different subject groups; bank loan officers, financial executives or other, less

sophisticated investors might provide insight into how differently these groups respond to reports on internal accounting control.

Preliminary research findings have indicated that the content of auditors' reports impact on security prices (Firth, 1978) and affect bank lending officer decisions (Libby, 1979). Content issues relative to reports on internal control are important, especially as they impact user perceptions in combination with various forms of auditor reports. Also, research identifying user perceptions of attributes that result in strong systems of internal accounting control might provide answers to both form and content issues.

Finally, research as to whether and how the investment decision process might be impacted by reports on internal accounting control would allow accounting policy makers to better assess the relative social benefits of required disclosures of this information.

## REFERENCE LIST

- Ackoff, R. L. Management misinformation systems. Management Science, December 1967, 14, B147-156.
- American Accounting Association (AAA). A statement of basic accounting theory. Sarasota, Fla.: American Accounting Association, 1966.
- American Accounting Association (AAA). Committee on Basic Auditing Concepts. Studies in accounting research no. 6. Sarasota, Fla.: American Accounting Association, 1973.
- American Institute of Certified Public Accountants (AICPA). Auditing Standards Board. Statements on auditing standards. New York: American Institute of Certified Public Accountants, January 1977(a).
- American Institute of Certified Public Accountants (AICPA). Auditing Standards Board. Exposure draft: Proposed statement on auditing standards. Reporting on internal accounting control. New York: American Institute of Certified Public Accountants, December 31, 1979.
- American Institute of Certified Public Accountants (AICPA). Auditing Standards Board. Report on internal accounting control. Statement on auditing standards no. 30. New York: American Institute of Certified Public Accountants, July 1980.
- American Institute of Certified Public Accountants (AICPA). Commission on Auditor's Responsibilities (Cohen Commission). Report of tentative conclusions. New York: American Institute of Certified Public Accountants, 1977(b).
- American Institute of Certified Public Accountants (AICPA). Commission on Auditor's Responsibilities (Cohen Commission). Report, conclusion and recommendations. New York: American Institute of Certified Public Accountants, 1978.

- Arnold, T. L. Toward a consequence-oriented accounting policy model. Unpublished manuscript, 1976.
- Ashton, R. H. An experimental study of internal control judgments. Journal of Accounting Research, September 1974, 12, 143-157.
- Ashton, R. H. Cognitive changes induced by accounting changes: Experimental evidence on the functional fixation hypotheses. Studies on Human Information Processing in Accounting, Supplement to Journal of Accounting Research, 1976, pp. 1-17.
- Barefield, R. The effect of aggregation on decision making success: A laboratory study. Journal of Accounting Research, Autumn 1972, pp. 229-242.
- Beach, B. H. Expert judgment about uncertainty: Bayesian decision making in realistic settings. Organizational Behavior and Human Performance, August 1975, pp. 10-59.
- Beach, L. R. Accuracy and consistency in the revision of subjective probabilities. Transactions on Human Factors in Electronics, 1966, pp. 29-37.
- Beaver, W. H. Financial ratios as predictors of failure. Empirical Research in Accounting: Selected Studies, 1966, pp. 71-111.
- Becker, G. M., & McClintock, C. G. Value: Behavioral decision theory. Annual Review of Psychology, 1967, 18, 239-286.
- Bierman, H. Probability, statistical decision theory, and accounting. In S. R. Houston, W. L. Duff, & R. M. Lynch (Eds.), Applications in Bayesian decision processes. New York: MSS Information Corp., 1975.
- Birnberg, J. Human information processing and financial disclosure. Unpublished manuscript, University of Pittsburgh, May 1975.
- Blocher, E. A., & Robertson, J. C. Bayesian sampling procedures for auditors: Computer-assisted instruction. The Accounting Review (Education research), April 1976, 51, 359-363.
- Borch, K., & Mossin, J. Risk and uncertainty. New York: Macmillan, 1968.

- Brabb, G. J., & Livingston, E. J. Decision analysis approach to business decisions. Decision Sciences, July 1976, 7, 538-546.
- Burton, J. C. Some general and specific thoughts on the accounting environment. Journal of Accountancy, October 1973, p. 42.
- Charnetski, J. R. Bayesian decision making with ordinal information. Operations Research, September-October 1977, 25, 889-892.
- Chesley, G. R. Elicitation of subjective probabilities: A review. The Accounting Review, April 1975, pp. 325-335.
- Corless, J. Assessing prior distributions for applying Bayesian statistics in auditing. The Accounting Review, July 1972, pp. 556-566.
- Corless, J. Comment on assessing prior distributions for applying Bayesian statistics in auditing: A reply. The Accounting Review, January 1975, 50, 158-159.
- Crabtree, M. G. New approach to effective sampling for auditors. Accountant (England), April 29, 1976, 174, 500-501.
- Cyert, R. M., & March, J. G. A behavioral theory of the firm. Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1963.
- Dermer, J. D. Cognitive characteristics and the perceived importance of information. The Accounting Review, July 1973, pp. 511-519.
- Diamond, M. The effect of supplemental replacement cost disclosures on bank loan decisions: An empirical analysis. Unpublished doctoral dissertation, University of California at Los Angeles, 1978.
- Dickhaut, J. Alternative information structures and probability revisions. The Accounting Review, January 1973, pp. 61-79.
- Driscoll, D. A., & Mock, T. J. Models and behavioral factors in human information processing. Working paper, Department of Accounting, University of Southern California, November 1976.

- Driver, M., & Mock, T. J. Human information processing, decision style theory and accounting information systems. The Accounting Review, July 1975, pp. 490-508.
- DuCharme, W. M. A response bias explanation of conservative human inference. Journal of Experimental Psychology, 1970, 85, 66-74.
- Dyckman, T., Smidt, S., & McAdams, A. K. Management decision making under uncertainty. London: The Macmillan Co., 1969.
- Dyckman, T. R., Downes, D. H., & Magee, R. P. Efficient capital markets and accounting: A critical analysis. Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1975.
- Edwards, W. Probability preferences in gambling. American Journal of Psychology, 1953, 66, 349-364.
- Edwards, W. The prediction of decisions among bets. Journal of Experimental Psychology, 1955, 50, 201-214.
- Edwards, W. Dynamic decision theory and probabilistic information processing. Human Factors, April 1962, pp. 59-73.
- Edwards, W. Conservatism in human information processing. In B. Kleenmuntz (Ed.), Formal representation of human judgment. New York: Wiley & Sons, 1968.
- Edwards, W., Lindman, H., & Savage, L. J. Bayesian statistical inference for psychological research. Psychological Review, 1963, 70, 193-242.
- Einhorn, H. J. The use of nonlinear, noncompensatory models as a function of task and amount of information. Organizational Behavior and Human Performance, 1971, 6, 1-27.
- Ellsberg, D. Risk ambiguity and the Savage axioms. Quarterly Journal of Economics, November 1961, 75, 643-669.
- Ellsberg, D. Risk ambiguity and the Savage axioms: A reply. Quarterly Journal of Economics, 1963, 77, 336-342.
- Ernst & Whinney. SEC Proposes public reporting on internal control. Financial reporting developments. Cleveland, Ohio: July 1979.



- Felix, W. L. Evidence on alternative means of assessing prior probability distributions for audit decision making. The Accounting Review, October 1976, pp. 13-22.
- Firth, M. Qualified audit reports: Their impact on investment decisions. The Accounting Review, July 1978, 53, 642-650.
- Golden, M. Some effects of combining psychological tests on clinical inferences. Journal of Consulting Psychology, 1964, 28, 440-446.
- Gustafson, D. Evaluation of probabilistic information processing in medical decision making. Organizational Behavior in Human Performance, 1969, 4, 20-34.
- Hayes, J. R. Human data processing limits in decision making. In E. Bennett (Ed.), Information System Science and Engineering Proceedings of the First Congress on Information Systems Sciences, 1964.
- Hays, W. L. Statistics for the social sciences. New York: Holt, Rinehart and Winston, Inc., 1973.
- Hoffman, P. J., & Blanchard, W. A. A study of the effects of varying amounts of predictor information on judgment. Oregon Research Institute Research Bulletin. Eugene: Oregon Research Institute, University of Oregon, 1961.
- Hogarth, R. M. Cognitive processes and the assessment of subjective probability distributions. Journal of the American Statistical Association, July 1975, 70, 271-294. (a)
- Hogarth, R. M. Decision time as a function of task complexity. In D. Wendt & C. A. J. Vlek (Eds.), Utility, probability and human decision making. Boston: D. Reidel Pub. Co., 1975. (b)
- Houston, S. R., Duff, W. L., & Lynch, R. M. Applications in Bayesian decision processes. New York: MSS Information Corp., 1975.
- Hunt, W. A., & Walker, R. E. Validity of diagnostic information and function of amount of test information. Journal of Clinical Psychology, 1966, 22, 154-155.

- Jacoby, J. Perspectives on a consumer information processing research program. Communications Research, 1975, 2, 203-215.
- Kahneman, D., & Tversky, A. Subjective probability: A judgment of representativeness. Cognitive Psychology, 1972, 3, 430-454.
- Kaplan, R. S. Stochastic model for auditing. Journal of Accounting Research, Spring 1973, 11, 38-46.
- Katz, D., & Kahn, R. J. The social psychology of organizations. New York: Wiley & Sons, 1966.
- Kennedy, H. A behavioral study of the usefulness of four financial ratios. Journal of Accounting Research, Spring 1975, pp. 97-116.
- Kerlinger, F. N. Foundations of behavioral research. New York: Holt, Rinehart and Winston, Inc., 1973.
- Kerlinger, F. N., & Pedhazur, E. J. Multiple regression in behavioral research. New York: Holt, Rinehart and Winston, Inc., 1973.
- Knoblett, J. A. The applicability of Bayesian statistics in auditing. Decision Sciences, July-October 1970, pp. 423-440.
- Kraft, W. H., Jr. Statistical sampling for auditors: A new look. Journal of Accountancy, August 1968, pp. 47-56.
- Kwon, I. Statistical decision theory with business and economic applications: A Bayesian approach. New York: Petrocelli/Charter, 1978.
- Lea, R. B. Issues involved in mandatory public reporting by the auditor on the quality of internal accounting control systems. Unpublished paper presented at the University of Southern California Accounting Research Forum, Los Angeles, April 20, 1977.
- Libby, R. Prediction achievement and the use of simulated decision makers in information evaluation. Unpublished doctoral dissertation, University of Illinois, 1974.

- Libby, R., & Lewis, B. L. Human information processing research in accounting: The state of the art. Accounting, Organizations and Society, 1977, Vol. 2, No. 3, 245-268.
- MacCrimmon, K. R. Descriptive and normative implications of the decision-theory postulates. In K. Borch & J. Mossin (Eds.), Risk and uncertainty. New York: Macmillan, 1968.
- Magee, R. P. Discussion of auditors' loss functions implicit in consumption-investment models. In Studies on Statistical Methodology in Auditing, 10th Conference on Research in Accounting. Chicago: University of Chicago, 1976.
- Mautz, R. K. Financial reporting by diversified companies. In W. C. Uecker, An inquiry into the need for currently feasible extensions of the attest function in corporate annual reports. Accounting, Organizations and Society, 1977, Vol. 2, No. 3, 47-58.
- Mautz, R. K., & Sharaf, H. A. The philosophy of auditing. Madison, Wisc.: American Accounting Association, 1961.
- May, R., & Sundem, G. Research for accounting policy: An overview. The Accounting Review, October 1961, pp. 747-764.
- Meyer, D. L. Bayesian statistics. In S. R. Houston, W. L. Duff, & R. M. Lynch (Eds.), Applications in Bayesian decision processes. New York: MSS Information Corp., 1975.
- Miller, D., & Gordon, C. A. Conceptual levels and the design of accounting information systems. Decision Sciences, April 1975, 6, 259-269.
- Mock, T. J. Measurement and accounting information criteria. Studies in accounting research no. 13. Sarasota, Fla.: American Accounting Association, 1976.
- Morris, P. A. Combining expert judgments: A Bayesian approach. Management Science, March 1977, 23, 679-693.

- Neave, E. H., & Wiginton, J. C. Evaluating security performance forecasts. Management Science, December 1976, 23, 371-379.
- Nie, N. H., et al. SPSS-statistical package for the social sciences (2nd Ed.). New York: McGraw-Hill, 1975.
- Norby, W. C., & Stone, F. G. Objectives of financial accounting and reporting from the viewpoint of the financial analysts. Financial Analysts Journal, July-August 1972, p. 40.
- Palmer, R. Objectives of financial statements. CPA Journal, May 1974, p. 15.
- Payne, J. Task complexity and contingent processing in decision making: An information search and protocol analysis. Organizational Behavior and Human Performance, October 1976, pp. 366-387.
- Peterson, C., & Beach, L. Man as an intuitive statistician. Psychological Bulletin, July 1967, pp. 29-46.
- Peterson, C. R., & DuCharme, W. M. A primacy effect in subjective probability revision. Journal of Experimental Psychology, 1967, Vol. 73, No. 1, 6-65.
- Peterson, C. R., DuCharme, W. M., & Edwards, W. Sampling distributions and probability revisions. Journal of Experimental Psychology, 1968, 76, 236-243.
- Peterson, C. R., Schneider, R. J., & Miller, A. J. Sample size and the revision of subjective probabilities. Journal of Experimental Psychology, 1965, 69, 522-527.
- Peterson, C. R., & Swensson, R. G. Intuitive statistical inferences about diffuse hypotheses. Organizational Behavior and Human Performance, 1968, 3, 1-11.
- Philips, D. J., & Dawson, L. E. Bayesian statistics in retail inventory management. In S. R. Houston, W. L. Duff, & R. M. Lynch (Eds.), Applications in Bayesian decision processes. New York: MSS Information Corp., 1975.

- Phillips, L. D. Bayesian statistics for social scientists. New York: Thomas Y. Crowell Company, 1973.
- Phillips, L. D., & Edwards, W. Conservatism in a simple probability inference task. Journal of Experimental Psychology, 1966, 72, 346-354.
- Phillips, L. D., Hays, W. L., & Edwards, W. Conservatism in complex probabilistic inference. IEEE Transactions on Human Factors in Electronics, March 7, 1966, Vol. 1, No. 1, 7-18.
- Pitz, G. F., & Downing, L. Optimal behavior in a decision making task as a function of instructions and payoffs. Journal of Experimental Psychology, 1967, 73, 549-555.
- Pitz, G. F., & Reinhold, H. Payoff effects in sequential decision making. Journal of Experimental Psychology, 1968, 77, 249-257.
- Revsine, L. Data expansion and conceptual structure. The Accounting Review, October 1970, pp. 704-711.
- Root, H. E. Probability statements in weather forecasting. In B. H. Beach, Expert judgment about uncertainty. Organizational Behavior and Human Performance, 1975, 14, 10-59.
- Sanders, F. On subjective probability forecasting. In B. H. Beach, Expert judgment about uncertainty. Organizational Behavior and Human Performance, 1975, 14, 10-59.
- Savage, L. J. The foundations of statistics. New York: Wiley & Sons, 1954.
- Schaefer, R. E., & Borcheoding, K. The assessment of subjective probability distributions: A training experiment. Acta Psychologica, 1973, pp. 117-129.
- Schlaifer, R. Probability and statistics for business decisions. New York: McGraw-Hill, 1959.
- Schroder, H. M., Driver, M. J., & Streufert, S. Human information processing. New York: Holt, Rinehart and Winston, Inc., 1967.
- Scott, W. R. Bayesian approach to asset valuation and audit size. Journal of Accounting Research, Autumn 1973, 2, 304-330.

- Scott, W. R. Auditors' loss functions implicit in consumption-investment models. In Studies on Statistical Methodology in Auditing, 10th Conference on Research in Accounting. Chicago: University of Chicago, 1976.
- Securities Exchange Commission (SEC). In the matter of Interstate Hosiery Mills, Inc., 4 S.E.C. 706, 721 (1939). In SEC Accounting Release No. 62. Washington, D.C.: Securities Exchange Commission, 1947.
- Securities Exchange Commission (SEC). SEC Accounting Release No. 34-15772. Washington, D.C.: Securities Exchange Commission, April 30, 1979.
- Securities Exchange Commission (SEC). Statement of management on internal accounting control. In SEC Accounting Release No. 278 (No. 34-16877). Washington, D.C.: Securities Exchange Commission, June 6, 1980.
- Slovic, P., & Lichtenstein, S. Comparison of Bayesian and regression approaches to the study of information processing in judgment. Organizational Behavior and Human Performance, June 1971, pp. 649-744.
- Smith, K. A. The relationship of internal control evaluation and audit sample size. The Accounting Review, April 1972, pp. 260-269.
- Sorensen, J. E. Bayesian analysis in auditing. The Accounting Review, July 1969, pp. 555-561.
- Sorter, G. H. An events' approach to basic accounting theory. The Accounting Review, January 1969, p. 18.
- Sorter, G. H., Ingberman, M., & Schiff, M. Roundtable discussion: The FCPA and internal controls. New York: Ross Institute, New York University, November 1978.
- Soskin, W. F. Influence of four types of data on diagnostic conceptualization in psychological testing. Journal of Abnormal Social Psychology, 1965, 58 368-373.
- Tersine, R. J. Organization decision theory: A synthesis. In S. R. Houston, W. L. Duff, & R. M. Lynch (Eds.), Applications in Bayesian decision processes. New York: MSS Information Corp., 1975.

- Tracy, J. A. Bayesian statistical methods in auditing. The Accounting Review, January 1969, pp. 90-98.
- Tsao, C. S. A Bayesian approach to estimating decision parameters in a replacement inventory system. In S. R. Houston, W. L. Duff, & R. M. Lynch (Eds.), Applications in Bayesian decision processes. New York: MSS Information Corp., 1975.
- Tversky, A., & Kahneman, D. Judgment under uncertainty: Heuristics and biases. Science, 1974, 185, 1124-1131.
- Uecker, W. C. An inquiry into the need for currently feasible extensions of the attest function in corporate annual reports. Accounting, Organizations and Society, 1977, Vol. 2, No. 1, 47-58.
- U.S. Congress, Senate. Foreign Corrupt Practices Act of 1977, Pub. L. 95-213, 95th Cong., 1st sess., 1977, S. Rept. 114.
- Ward, B. H. Assessing prior distributions for applying Bayesian statistics in auditing: A comment. The Accounting Review, January 1975, 50, 155-157.
- Weber, J. D. Historical aspects of the Bayesian controversy. Tucson: University of Arizona Press, 1973.
- Wilson, C. Z., & Alexis, M. Organization decision making. Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1967.
- Winkler, R. L. The assessment of prior distribution in Bayesian analysis. The Journal of the American Statistical Association, 1967, pp. 775-800.
- Winkler, R. L., & Barry, C. B. Bayesian model for portfolio selection and revision. Journal of Finance, March 1975, 30, 179-192.

APPENDIXES



APPENDIX A

EXPERIMENTAL GROUP 1 QUESTIONNAIRE:  
MANAGEMENT'S REPORT ON INTERNAL CONTROL

UNIVERSITY OF SOUTHERN CALIFORNIA  
SCHOOL OF BUSINESS ADMINISTRATION  
UNIVERSITY PARK  
LOS ANGELES, CALIFORNIA 90007

SCHOOL OF ACCOUNTING

Thank you in advance for taking part in our study. We are conducting a research project at the School of Accounting of the University of Southern California to study the relationship between accounting data and decision making. As a member of a very select group of decision makers, your input is very valuable in our research.

The task you are about to undertake is an experiment in decision making. The experiment is expected to take about 25 minutes to complete. Assume that the financial statements presented are those of a company you are considering as an investment. Analyze the information presented to you just as you do when making an investment decision. Please feel free to utilize calculators in your analysis.

Your responses will be held in the strictest confidence. All questionnaires will be handled on an anonymous basis and individual results will not be reported in the research findings. Thank you once again for your participation.

Sincerely,

Doyle Z. Williams  
Professor and Dean

Ralph B. Williams  
Lecturer

### INTRODUCTION

The experiment has two parts: Part A and Part B. Do not review the questions in Part A until you have completed the analysis of the financial statements presented in that part. When all questions have been answered in Part A, go on to Part B. In order to answer the questions in Part B, you may refer to the information in Part A. However, do not change any of your responses to the questions in Part A.

Some of the questions in Parts A and B are subjective in nature. That is, they do not have right or wrong answers. Most of these questions require that your response be registered on a scale similar to the one reproduced below. When responding to such questions, please indicate your response by drawing an arrow to the number you wish to select. In addition to the scale, there is a space to allow you to write in the exact number you chose.



The following questions ask you to express a degree of confidence as a number between 0 and 1. For example, one might respond that he is 0.72 confident of the existence of a condition or the occurrence of an event. This statement might be interpreted as meaning that he is 72% certain.

Please begin to analyze the information in Part A.

PART A

REPORT OF INDEPENDENT PUBLIC ACCOUNTANTS

To the Stockholders:

We have examined the consolidated balance sheets of The Rupe! Company and Subsidiaries as of December 31, 1979, and December 31, 1978, and the consolidated statements of operations, paid-in capital, retained earnings and changes in financial position for the five years ended December 31, 1979. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the financial statements referred to above present fairly the financial position of The Rupe! Company and Subsidiaries as of December 31, 1979, and December 31, 1978, and the results of their operations and changes in financial position for the five years ended December 31, 1979, in conformity with generally accepted accounting principles consistently applied during the periods.

ARTHUR AUDITOR & CO.

Westfield, Illinois,  
April 30, 1980

THE RUPEL COMPANY AND SUBSIDIARIES

**CONSOLIDATED BALANCE SHEETS**

December 31, 1979 and December 31, 1978

ASSETS

	(In thousands)	
	1979	1978
<b>Current Assets:</b>		
Cash .....	\$ 8,457	\$ 9,298
Marketable securities, less allowance for market decline of \$52,000 in 1979 and \$326,000 in 1978 .....	456	1,104
Accounts receivable, less allowance for doubtful accounts of \$864,000 in 1979 and \$871,000 in 1978 .....	26,440	24,663
Inventories, principally ingredients and wrapping supplies .....	19,921	19,008
Future tax benefits .....	330	115
Prepaid expenses and deposits .....	737	1,057
<b>Total current assets</b> .....	<u>\$ 56,341</u>	<u>\$ 55,245</u>
<b>Other Assets</b> .....	<u>\$ 1,428</u>	<u>\$ 1,319</u>
<b>Plant and Equipment, including rights to leased property at cost:</b>		
<b>Land</b> .....	\$ 3,328	\$ 3,311
Buildings and improvements .....	35,659	33,425
Machinery and equipment .....	73,812	69,424
Delivery equipment .....	21,307	22,176
Construction in progress .....	1,268	1,778
	<u>\$135,374</u>	<u>\$130,114</u>
<b>Less—Accumulated depreciation, amortization and provisions for     plant closings and idle equipment</b> .....	83,639	81,569
	<u>\$ 51,735</u>	<u>\$ 48,545</u>
	<u>\$109,504</u>	<u>\$105,109</u>

See notes to financial statements.

THE RUPEL COMPANY AND SUBSIDIARIES

**CONSOLIDATED BALANCE SHEETS**

December 31, 1979 and December 31, 1978

LIABILITIES AND STOCKHOLDERS' EQUITY

	(In thousands)	
	1979	1978
<b>Current Liabilities:</b>		
Notes payable (including \$1,625,000 in 1979 and \$2,200,000 in 1978 payable to banks) (Note 2) .....	\$ 2,863	\$ 2,200
Current maturities of long-term debt (Note 3) .....	3,459	3,491
Accounts payable .....	23,632	31,041
Accrued liabilities .....	10,887	7,633
Accrued taxes on income .....	2,811	180
Dividends payable .....	449	204
<b>Total current liabilities</b> .....	<u>\$ 44,101</u>	<u>\$ 44,749</u>
Long-Term Liabilities, less current maturities .....	<u>\$ 20,299</u>	<u>\$ 19,246</u>
Deferred Income Taxes (Note 1) .....	<u>\$ 1,406</u>	<u>\$ 1,954</u>
Contingencies and Commitments		
<b>Stockholders' Equity</b>		
Cumulative prior preferred stock—		
authorized 200,000 shares—		
\$1.80 series, stated at liquidating value of \$35 per share; outstanding 65,116 shares in 1979 and 69,817 shares in 1978 .....	\$ 2,279	\$ 2,444
\$1.80 convertible series, stated at par value of \$25 per share; outstanding 90,000 shares in 1979 and 95,000 shares in 1978 .....	2,250	2,375
5% cumulative convertible preferred stock, \$100 par value; authorized 140,000 shares; outstanding 35,476 shares in 1979 and 37,609 shares in 1978 .....	3,548	3,761
Common stock, no par value; authorized 5,000,000 shares; issued 2,087,464 shares in 1979 and 1978 .....	9,087	9,087
Paid-in capital .....	940	1,147
Retained earnings .....	27,208	22,680
	<u>\$ 45,312</u>	<u>\$ 41,494</u>
Less—Common stock held in treasury, at cost; 424,718 shares in 1979 and 484,238 shares in 1978 .....	1,614	2,334
	<u>\$ 43,698</u>	<u>\$ 39,160</u>
	<u>\$109,504</u>	<u>\$105,109</u>

See notes to financial statements.

THE RUPEL COMPANY AND SUBSIDIARIES

CONSOLIDATED STATEMENTS OF OPERATIONS

For the Five Years Ended December 31, 1979

	(In thousands, except per share data)				
	1979	1978	1977	1976	1975
Net sales .....	\$417,243	\$398,550	\$345,574	\$331,358	\$330,099
Costs and expenses:					
Cost of products sold (Note 1) .....	\$239,145	\$239,121	\$197,980	\$182,096	\$183,433
Selling, delivery, general and administrative expenses .....	161,240	153,023	143,681	140,880	138,973
Depreciation and amortization .....	7,312	7,280	7,114	6,745	7,026
Interest expense .....	1,826	2,001	1,566	1,052	847
	<u>\$409,523</u>	<u>\$401,425</u>	<u>\$350,341</u>	<u>\$330,773</u>	<u>\$330,279</u>
Earnings (loss) before income taxes and extraordinary items .....	\$ 7,720	\$ (2,875)	\$ (4,767)	\$ 585	\$ (180)
Income taxes:					
Current .....	\$ 4,764	\$ 323	\$ (1,536)	\$ 234	\$ 262
Deferred .....	(763)	(1,500)	(627)	178	(171)
Investment credit realized .....	(2,020)	—	(585)	—	—
	<u>\$ 1,981</u>	<u>\$ (1,177)</u>	<u>\$ (2,748)</u>	<u>\$ 412</u>	<u>\$ 91</u>
Earnings (loss) before extraordinary items .....	\$ 5,739	\$ (1,698)	\$ (2,019)	\$ 173	\$ (271)
Extraordinary items, net of tax .....	—	—	—	2,621	(1,777)
Net earnings (loss) .....	\$ 5,739	\$ (1,698)	\$ (2,019)	\$ 2,794	\$ (2,048)
Dividends declared on preferred stock .....	(473)	(506)	(535)	(588)	(698)
Net earnings (loss) applicable to common stock .....	<u>\$ 5,266</u>	<u>\$ (2,204)</u>	<u>\$ (2,554)</u>	<u>\$ 2,206</u>	<u>\$ (2,746)</u>
Weighted average common shares outstanding .....	<u>1,622</u>	<u>1,967</u>	<u>2,001</u>	<u>2,061</u>	<u>2,065</u>
Earnings (loss) per common share					
Assuming no dilution—					
Before extraordinary items .....	\$ 3.25	\$ (1.12)	\$ (1.28)	\$ (.20)	\$ (.47)
Extraordinary items, net of tax .....	—	—	—	1.27	(.86)
Net earnings (loss) .....	<u>\$ 3.25</u>	<u>\$ (1.12)</u>	<u>\$ (1.28)</u>	<u>\$ 1.07</u>	<u>\$ (1.33)</u>
Assuming full dilution—					
Before extraordinary items .....	\$ 2.72	\$ (1.12)	\$ (1.28)	\$ (.20)	\$ (.47)
Extraordinary items, net of tax .....	—	—	—	1.07	(.86)
Net earnings (loss) .....	<u>\$ 2.72</u>	<u>\$ (1.12)</u>	<u>\$ (1.28)</u>	<u>\$ .87</u>	<u>\$ (1.33)</u>

See notes to financial statements.

THE RUPEL COMPANY AND SUBSIDIARIES  
**CONSOLIDATED STATEMENTS OF CHANGES  
 IN FINANCIAL POSITION**

For the Five Years Ended December 31, 1979

	(In Thousands)				
	1979	1978	1977	1976	1975
<b>Sources of Working Capital:</b>					
Net earnings (loss) before extraordinary items .....	\$ 5,739	\$(1,698)	\$(2,019)	\$ 173	\$ (271)
Add (Deduct) items not affecting working capital—					
Depreciation and amortization .....	7,312	7,280	7,114	6,745	7,026
Deferred income taxes .....	(763)	(1,500)	(1,135)	373	13
Provisions for closed plants and idle equipment .....	789	1,315	372	—	—
Working capital provided from operations, exclusive of extraordinary items .....	\$13,077	\$ 5,397	\$ 4,332	\$ 7,291	\$ 6,768
Property dispositions, including in 1977 extraordinary gain on sale of four plants .....	976	1,431	2,023	7,107	256
Proceeds from stock options exercised .....	376	—	—	—	162
Additions to long-term liabilities .....	6,488	4,502	2,200	10,099	1,500
	<u>\$20,917</u>	<u>\$11,330</u>	<u>\$ 8,555</u>	<u>\$24,497</u>	<u>\$ 8,686</u>
<b>Applications of Working Capital:</b>					
Goodwill resulting from acquisition .....	\$ —	\$ —	\$ —	\$ 342	\$ 664
Reduction of long-term debt .....	5,435	4,474	1,411	3,451	1,857
Additions to plant and equipment .....	11,778	8,945	6,461	9,251	5,686
Dividends declared .....	1,211	883	934	999	1,112
Purchase of stock, since retired					
Cumulative prior preferred, \$1.80 series .....	91	79	103	65	85
5% cumulative convertible preferred .....	150	342	451	1,686	285
Purchase of common stock for the treasury .....	—	1,176	642	303	—
Redemption of cumulative prior preferred, \$1.80 con- vertible series .....	125	125	—	—	—
Charges incurred relating to closed plants .....	489	1,010	1,164	2,212	707
Settlement of antitrust litigation .....	—	—	—	400	50
Other items, net .....	(106)	1,039	891	78	(57)
	<u>\$19,173</u>	<u>\$18,073</u>	<u>\$12,057</u>	<u>\$18,788</u>	<u>\$10,389</u>
Increase (Decrease) in Working Capital .....	\$ 1,744	\$(6,743)	\$(3,502)	\$ 5,709	\$(1,703)
<b>Working Capital:</b>					
Beginning of year .....	10,496	17,239	20,741	15,032	16,735
End of year .....	<u>\$12,240</u>	<u>\$10,496</u>	<u>\$17,239</u>	<u>\$20,741</u>	<u>\$15,032</u>
<b>Increase (Decrease) in Components of Working Capital:</b>					
Cash .....	\$ (841)	\$ 3,765	\$ 753	\$ 778	\$ 92
Marketable securities .....	(648)	(921)	427	(166)	(4,826)
Notes receivable .....	—	—	(6,200)	6,200	—
Accounts receivable .....	1,777	1,111	(1,222)	4,263	956
Inventories .....	913	6,666	2,444	2,126	1,596
Future tax benefits .....	215	(1,906)	1,028	(981)	1,974
Prepaid expenses and deposits .....	(320)	(6)	175	120	(136)
Notes payable and current maturities of long-term debt .....	(631)	(2,338)	(2,406)	916	12
Accounts payable .....	7,409	(13,844)	(794)	(5,455)	(1,343)
Accrued liabilities .....	(3,254)	885	1,546	(1,487)	(536)
Dividends payable .....	(245)	25	12	32	14
Accrued taxes on income .....	(2,631)	(180)	735	(637)	494
	<u>\$ 1,744</u>	<u>\$(6,743)</u>	<u>\$(3,502)</u>	<u>\$ 5,709</u>	<u>\$(1,703)</u>

See notes to financial statements.



THE NUPEL COMPANY AND SUBSIDIARIES

CONSOLIDATED STATEMENTS OF PAID-IN CAPITAL  
AND RETAINED EARNINGS

For the Five Years Ended December 31, 1979

	(In thousands)				
	1979	1978	1977	1976	1975
<i>Paid-In Capital</i>					
Beginning of year .....	\$ 1,147	\$ 989	\$ 814	\$ 236	\$ 5
Excess of cost (first-in, first-out basis) over proceeds of common stock op- tions exercised .....	(344)	—	—	—	—
Excess of the par value over the cost of preferred stock (in treasury) re- tired .....	137	158	175	578	231
End of year .....	<u>\$ 940</u>	<u>\$ 1,147</u>	<u>\$ 989</u>	<u>\$ 814</u>	<u>\$ 236</u>
<i>Retained Earnings</i>					
Beginning of year .....	\$22,680	\$25,261	\$28,214	\$26,419	\$29,579
Net earnings (loss) for the year ...	5,739	(1,698)	(2,019)	2,794	(2,048)
Dividends declared—					
Cumulative prior preferred stock—					
\$1.80 series (\$1.80 per share)	(120)	(128)	(136)	(142)	(148)
\$1.80 convertible series (\$1.80 per share) .....	(171)	(180)	(180)	(180)	(180)
5% cumulative convertible pre- ferred stock (\$5 per share) ..	(182)	(198)	(219)	(266)	(370)
Common stock (\$.20 per share in 1975, 1976, 1977, and 1978 and \$.45 per share in 1979) ..	(738)	(377)	(399)	(411)	(414)
End of year .....	<u>\$27,208</u>	<u>\$22,680</u>	<u>\$25,261</u>	<u>\$28,214</u>	<u>\$26,419</u>

See notes to financial statements.

THE RUPEL COMPANY

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

NOTE (1) Summary of Accounting Policies

Principles of Consolidation

The accompanying consolidated financial statements include all operating subsidiaries of the RupeL Company. Intercompany accounts and transactions have been eliminated in consolidation.

Marketable Securities

Marketable securities are included in the accompanying consolidated balance sheets at the lower of cost or market.

Intangible Assets

The excess of the company's investment over the underlying book value of net assets of subsidiaries purchased is being amortized over forty years. The amounts are included in other assets.

Investment Tax Credit

The company utilizes the flow-through method of recognizing investment tax credits in income in the year realized for tax purposes.

Inventories

All inventories are determined by physical count and are priced at the lower first-in, first-out cost or market. Finished goods inventory includes material, labor, and manufactured overhead.

Depreciation and Amortization

Depreciation provisions, based on estimated useful lives from the dates of acquisition, are computed on the straight-line method for financial reporting purposes. Leasehold improvements are being amortized over the lives of the respective leases.

For tax purposes, the company uses accelerated depreciation methods; resulting deferred federal income taxes are reflected as such in the financial statements.

NOTE (2) Notes Payable to Bank

The company has an informal compensating balance agreement with one of its banks and is expected to maintain average compensating balances of 10% of the line of credit (\$1,500,000).

NOTE (3) Long-term Liabilities

Annual maturities on indebtedness for the next four years are: \$3,459,000; \$3,237,000; \$3,024,000; \$2,512,000.

NOTE (4) Contingencies

The company is a defendant in several actions arising out of its business. Such suits are not uncommon. These suits typically seek large amounts in damages. Management believes that the company has meritorious defenses, is vigorously opposing each action, and in several cases has filed counterclaims, but management is unable at this time to estimate the ultimate aggregate liability of recovery, if any, of the company therefrom.

NOTE (5) Stock Options

Under the company's stock option plans, officers and key employees may be granted options to purchase the company's common stock at the fair market value at the date of grant. Options generally become exercisable six months after date of grant and expire five years after date of grant.

QUESTIONS - PART A

1. In terms of their fair presentation, what degree of confidence do you have in the financial statements presented?

No  
Confidence

A Great Deal  
of Confidence



Ans. \_\_\_\_\_

2. What degree of confidence do you have that the income statements fairly report the results of operations?

No  
Confidence

A Great Deal  
of Confidence



Ans. \_\_\_\_\_

3. What degree of confidence do you have that the income statements present a realistic representation of management's ability to utilize resources effectively?

No  
Confidence

A Great Deal  
of Confidence



Ans. \_\_\_\_\_

4. What degree of confidence do you have that the balance sheets fairly report financial position?

No  
Confidence

A Great Deal  
of Confidence



Ans. \_\_\_\_\_

5. What degree of confidence do you have that the balance sheet is a good representation of how management has safeguarded assets?

No  
Confidence

A Great Deal  
of Confidence



Ans. \_\_\_\_\_

6. How confident are you that management maintained a system of internal control adequate to prepare financial statements in accordance with generally accepted accounting principles?

No  
Confidence

A Great Deal  
of Confidence



Ans. \_\_\_\_\_

7. What is the likelihood that you would invest in this company?

No  
Confidence

A Great Deal  
of Confidence



Ans. \_\_\_\_\_

Part B

ADDITIONAL INFORMATION

Management's Responsibility for Financial Statements

The consolidated financial statements presented in this report are the responsibility of management and have been prepared to conform with generally accepted accounting principles consistently applied. Statement amounts include estimates resulting from management's analysis and evaluation based upon current knowledge.

The responsibility of our independent auditors, Arthur Auditor & Company, is limited to an expressed opinion on the fairness of the financial statements. The auditor's evaluation procedures include a review of systems and control procedures and testing deemed necessary to give reasonable assurance that our financial statements are not materially misleading or inaccurate. Other information included in this report is the Rupel Company's responsibility and is believed to be consistent with the financial representations.

To ensure that assets are safeguarded from loss due to unauthorized use or disposition and that accounting information is reliable, we maintain a system of accounting and corporate policies, procedures, and internal controls. Managers are carefully selected and trained; and high standards are maintained in accounting and administration and in formal policies and procedures. To reflect changing business conditions and reporting requirements, we continually modify and improve our policies, procedures and controls. We believe our system provides reasonable assurance that assets are safeguarded and that financial information is reliable.

Our board of directors discharges its responsibilities for adequate internal controls and accurate financial information with the assistance of an audit committee composed of nonmanagement board members. The committee meets with the company's independent auditors to evaluate management's performance in maintaining adequate accounting procedures and reporting processes, as well as other matters. The independent auditors have access to the audit committee and they meet (with and without management being present) to discuss the results of their examinations and to express opinions on internal controls and financial reporting.

The company has also developed and is presently implementing "Guidelines for Good Management Practices and Business Conduct." All employees are expected to understand and comply with these guidelines and to conduct the Rupel Company business throughout the world accordingly. We believe these guidelines will help assure that operations are conducted in compliance with laws and regulations and at the highest moral and ethical standards in all parts of the world.

Clyde T. Billingshe  
Vice President-Finance  
The Rupel Company

QUESTIONS - PART B

Based upon the financial statements in Part A and upon the additional information you have just received, carefully reevaluate your responses to the following questions. You may look back to Part A, but do not change your original response.

1. In terms of their fair presentation, what degree of confidence do you have in the financial statements presented?

No  
Confidence

A Great Deal  
of Confidence



Ans. \_\_\_\_\_

2. What degree of confidence do you have that the income statements fairly report the results of operations?

No  
Confidence

A Great Deal  
of Confidence



Ans. \_\_\_\_\_

3. What degree of confidence do you have that the income statements present a realistic representation of management's ability to effectively utilize resources?

No  
Confidence

A Great Deal  
of Confidence



Ans. \_\_\_\_\_

4. What degree of confidence do you have that the balance sheets fairly report financial position?

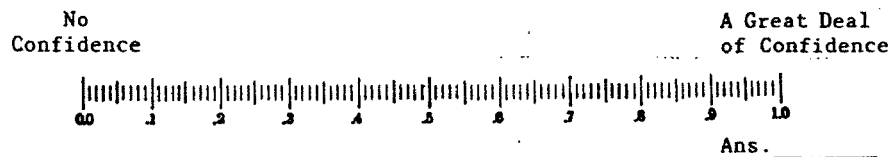
No  
Confidence

A Great Deal  
of Confidence

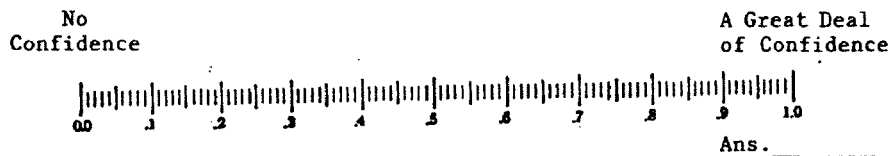


Ans. \_\_\_\_\_

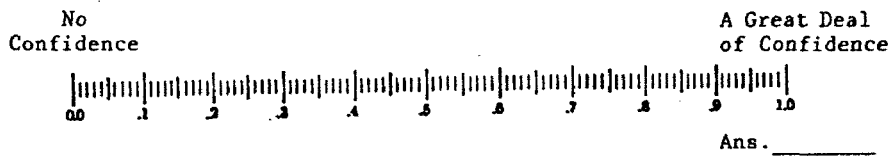
5. What degree of confidence do you have that the balance sheet is a good representation of how management has safeguard assets?



6. How confident are you that management maintained a system of internal control adequate to prepare financial statements in accordance with generally accepted accounting principles?



7. What is the likelihood that you would invest in this company?



BACKGROUND QUESTIONS

1. Age: \_\_\_\_\_ years

2. Highest level of education:

- \_\_\_\_\_ High School  
 \_\_\_\_\_ 2 Years College  
 \_\_\_\_\_ 4 Years College  
 \_\_\_\_\_ More than 4 years college

3. Approximately how many companies have you investigated during the past year?

\_\_\_\_\_ Companies

4. Number of years employed as a FA?

\_\_\_\_\_ Years

APPENDIX B

EXPERIMENTAL GROUP 2 QUESTIONNAIRE:  
MANAGEMENT'S REPORT ON INTERNAL  
CONTROL AND THE INDEPENDENT  
ACCOUNTANT'S REPORT



UNIVERSITY OF SOUTHERN CALIFORNIA  
SCHOOL OF BUSINESS ADMINISTRATION  
UNIVERSITY PARK  
LOS ANGELES, CALIFORNIA 90007

SCHOOL OF ACCOUNTING

Thank you in advance for taking part in our study. We are conducting a research project at the School of Accounting of the University of Southern California to study the relationship between accounting data and decision making. As a member of a very select group of decision makers, your input is very valuable in our research.

The task you are about to undertake is an experiment in decision making. The experiment is expected to take about 25 minutes to complete. Assume that the financial statements presented are those of a company you are considering as an investment. Analyze the information presented to you just as you do when making an investment decision. Please feel free to utilize calculators in your analysis.

Your responses will be held in the strictest confidence. All questionnaires will be handled on an anonymous basis and individual results will not be reported in the research findings. Thank you once again for your participation.

Sincerely,

Doyle Z. Williams  
Professor and Dean

Ralph B. Williams  
Lecturer

### INTRODUCTION

The experiment has two parts: Part A and Part B. Do not review the questions in Part A until you have completed the analysis of the financial statements presented in that part. When all questions have been answered in Part A, go on to Part B. In order to answer the questions in Part B, you may refer to the information in Part A. However, do not change any of your responses to the questions in Part A.

Some of the questions in Parts A and B are subjective in nature, That is, they do not have right or wrong answers. Most of these questions require that your response be registered on a scale similar to the one reproduced below. When responding to such questions, please indicate your response by drawing an arrow to the number you wish to select. In addition to the scale, there is a space to allow you to write in the exact number you chose.



Ans. 0.72

The following questions ask you to express a degree of confidence as a number between 0 and 1. For example, one might respond that he is 0.72 confident of the existence of a condition or the occurrence of an event. This statement might be interpreted as meaning that he is 72% certain.

Please begin to analyze the information in Part A.

PART A

REPORT OF INDEPENDENT PUBLIC ACCOUNTANTS

To the Stockholders:

We have examined the consolidated balance sheets of The Rupel Company and Subsidiaries as of December 31, 1979, and December 31, 1978, and the consolidated statements of operations, paid-in capital, retained earnings and changes in financial position for the five years ended December 31, 1979. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the financial statements referred to above present fairly the financial position of The Rupel Company and Subsidiaries as of December 31, 1979, and December 31, 1978, and the results of their operations and changes in financial position for the five years ended December 31, 1979, in conformity with generally accepted accounting principles consistently applied during the periods.

ARTHUR AUDITOR & CO.

Westfield, Illinois,  
April 30, 1980

THE RUPEL COMPANY AND SUBSIDIARIES

**CONSOLIDATED BALANCE SHEETS**

December 31, 1979 and December 31, 1978

ASSETS

	(In thousands)	
	1979	1978
<b>Current Assets:</b>		
Cash .....	\$ 8,457	\$ 9,298
Marketable securities, less allowance for market decline of \$52,000 in 1979 and \$326,000 in 1978 .....	456	1,104
Accounts receivable, less allowance for doubtful accounts of \$864,000 in 1979 and \$871,000 in 1978 .....	26,440	24,663
Inventories, principally ingredients and wrapping supplies .....	19,921	19,008
Future tax benefits .....	330	115
Prepaid expenses and deposits .....	737	1,057
<b>Total current assets</b> .....	<u>\$ 56,341</u>	<u>\$ 55,245</u>
<b>Other Assets</b> .....	<u>\$ 1,428</u>	<u>\$ 1,319</u>
<b>Plant and Equipment, including rights to leased property at cost:</b>		
<b>Land</b> .....	\$ 3,328	\$ 3,311
Buildings and improvements .....	35,659	33,425
Machinery and equipment .....	73,812	69,424
Delivery equipment .....	21,307	22,176
Construction in progress .....	1,268	1,778
	<u>\$135,374</u>	<u>\$130,114</u>
<b>Less—Accumulated depreciation, amortization and provisions for     plant closings and idle equipment</b> .....	<u>83,639</u>	<u>81,569</u>
	<u>\$ 51,735</u>	<u>\$ 48,545</u>
	<u>\$109,504</u>	<u>\$105,109</u>

See notes to financial statements.

THE RUPEL COMPANY AND SUBSIDIARIES

CONSOLIDATED BALANCE SHEETS

December 31, 1979 and December 31, 1978

LIABILITIES AND STOCKHOLDERS' EQUITY

	(In thousands)	
	1979	1978
<b>Current Liabilities:</b>		
Notes payable (including \$1,625,000 in 1979 and \$2,200,000 in 1978 payable to banks) (Note 2) .....	\$ 2,863	\$ 2,200
Current maturities of long-term debt (Note 3) .....	3,459	3,491
Accounts payable .....	23,632	31,041
Accrued liabilities .....	10,887	7,633
Accrued taxes on income .....	2,811	180
Dividends payable .....	449	204
<b>Total current liabilities</b> .....	<u>\$ 44,101</u>	<u>\$ 44,749</u>
<b>Long-Term Liabilities, less current maturities</b> .....	<u>\$ 20,299</u>	<u>\$ 19,246</u>
<b>Deferred Income Taxes</b> (Note 1) .....	<u>\$ 1,406</u>	<u>\$ 1,954</u>
<b>Contingencies and Commitments</b>		
<b>Stockholders' Equity</b>		
Cumulative prior preferred stock—		
authorized 200,000 shares—		
\$1.80 series, stated at liquidating value of \$35 per share; outstanding 65,116 shares in 1979 and 69,817 shares in 1978 .....	\$ 2,279	\$ 2,444
\$1.80 convertible series, stated at par value of \$25 per share; outstanding 90,000 shares in 1979 and 95,000 shares in 1978 .....	2,250	2,375
5% cumulative convertible preferred stock, \$100 par value; authorized 140,000 shares; outstanding 35,476 shares in 1979 and 37,609 shares in 1978 .....	3,548	3,761
Common stock, no par value; authorized 5,000,000 shares; issued 2,087,464 shares in 1979 and 1978 .....	9,087	9,087
Paid-in capital .....	940	1,147
Retained earnings .....	27,208	22,680
	<u>\$ 45,312</u>	<u>\$ 41,494</u>
<b>Less—Common stock held in treasury, at cost; 424,718 shares in 1979 and 484,238 shares in 1978</b> .....	1,614	2,334
	<u>\$ 43,698</u>	<u>\$ 39,160</u>
	<u>\$109,504</u>	<u>\$105,109</u>

See notes to financial statements.

THE RUPEL COMPANY AND SUBSIDIARIES

CONSOLIDATED STATEMENTS OF OPERATIONS

For the Five Years Ended December 31, 1979

	(In thousands, except per share data)				
	1979	1978	1977	1976	1975
Net sales .....	\$417,243	\$398,550	\$345,574	\$331,358	\$330,099
Costs and expenses:					
Cost of products sold (Note 1) .....	\$239,145	\$239,121	\$197,980	\$182,096	\$183,433
Selling, delivery, general and administrative expenses .....	161,240	153,023	143,681	140,880	138,973
Depreciation and amortization .....	7,312	7,280	7,114	6,745	7,026
Interest expense .....	1,826	2,001	1,566	1,052	847
	<u>\$409,523</u>	<u>\$401,425</u>	<u>\$350,341</u>	<u>\$330,773</u>	<u>\$330,279</u>
Earnings (loss) before income taxes and extraordinary items .....	\$ 7,720	\$ (2,875)	\$ (4,767)	\$ 585	\$ (180)
Income taxes:					
Current .....	\$ 4,764	\$ 323	\$ (1,536)	\$ 234	\$ 262
Deferred .....	(763)	(1,500)	(627)	178	(171)
Investment credit realized .....	(2,020)	—	(585)	—	—
	<u>\$ 1,981</u>	<u>\$ (1,177)</u>	<u>\$ (2,748)</u>	<u>\$ 412</u>	<u>\$ 91</u>
Earnings (loss) before extraordinary items .....	\$ 5,739	\$ (1,698)	\$ (2,019)	\$ 173	\$ (271)
Extraordinary items, net of tax .....	—	—	—	2,621	(1,777)
Net earnings (loss) .....	<u>\$ 5,739</u>	<u>\$ (1,698)</u>	<u>\$ (2,019)</u>	<u>\$ 2,794</u>	<u>\$ (2,048)</u>
Dividends declared on preferred stock .....	(473)	(506)	(535)	(588)	(698)
Net earnings (loss) applicable to common stock .....	<u>\$ 5,266</u>	<u>\$ (2,204)</u>	<u>\$ (2,554)</u>	<u>\$ 2,206</u>	<u>\$ (2,746)</u>
Weighted average common shares outstanding .....	1,622	1,967	2,001	2,061	2,065
Earnings (loss) per common share					
Assuming no dilution—					
Before extraordinary items .....	\$ 3.25	\$ (1.12)	\$ (1.28)	\$ (.20)	\$ (.47)
Extraordinary items, net of tax .....	—	—	—	1.27	(.86)
Net earnings (loss) .....	<u>\$ 3.25</u>	<u>\$ (1.12)</u>	<u>\$ (1.28)</u>	<u>\$ 1.07</u>	<u>\$ (1.33)</u>
Assuming full dilution—					
Before extraordinary items .....	\$ 2.72	\$ (1.12)	\$ (1.28)	\$ (.20)	\$ (.47)
Extraordinary items, net of tax .....	—	—	—	1.07	(.86)
Net earnings (loss) .....	<u>\$ 2.72</u>	<u>\$ (1.12)</u>	<u>\$ (1.28)</u>	<u>\$ .87</u>	<u>\$ (1.33)</u>

See notes to financial statements.

THE RUPEL COMPANY AND SUBSIDIARIES  
**CONSOLIDATED STATEMENTS OF CHANGES  
 IN FINANCIAL POSITION**

For the Five Years Ended December 31, 1979

	(In Thousands)				
	1979	1978	1977	1976	1975
<b>Sources of Working Capital:</b>					
Net earnings (loss) before extraordinary items .....	\$ 3,739	\$(1,698)	\$(2,019)	\$ 173	\$ (271)
Add (Deduct) items not affecting working capital—					
Depreciation and amortization .....	7,312	7,280	7,114	6,745	7,026
Deferred income taxes .....	(763)	(1,500)	(1,135)	373	13
Provisions for closed plants and idle equipment .....	789	1,315	372	—	—
Working capital provided from operations, exclusive of extraordinary items .....	<u>\$13,077</u>	<u>\$ 5,397</u>	<u>\$ 4,332</u>	<u>\$ 7,291</u>	<u>\$ 6,768</u>
Property dispositions, including in 1977 extraordinary gain on sale of four plants .....	976	1,431	2,023	7,107	256
Proceeds from stock options exercised .....	376	—	—	—	162
Additions to long-term liabilities .....	6,488	4,502	2,200	10,099	1,500
	<u>\$20,917</u>	<u>\$11,330</u>	<u>\$ 8,555</u>	<u>\$24,497</u>	<u>\$ 8,686</u>
<b>Applications of Working Capital:</b>					
Goodwill resulting from acquisition .....	\$ —	\$ —	\$ —	\$ 342	\$ 664
Reduction of long-term debt .....	5,435	4,474	1,411	3,451	1,857
Additions to plant and equipment .....	11,778	8,945	6,461	9,251	5,686
Dividends declared .....	1,211	883	934	999	1,112
Purchase of stock, since retired					
Cumulative prior preferred, \$1.80 series .....	91	79	103	65	85
5% cumulative convertible preferred .....	150	342	451	1,686	285
Purchase of common stock for the treasury .....	—	1,176	642	303	—
Redemption of cumulative prior preferred, \$1.80 con- vertible series .....	125	125	—	—	—
Charges incurred relating to closed plants .....	489	1,010	1,164	2,212	707
Settlement of antitrust litigation .....	—	—	—	400	50
Other items, net .....	(106)	1,039	891	78	(57)
	<u>\$19,173</u>	<u>\$18,073</u>	<u>\$12,057</u>	<u>\$18,788</u>	<u>\$10,389</u>
Increase (Decrease) in Working Capital .....	\$ 1,744	\$(6,743)	\$(3,502)	\$ 5,709	\$(1,703)
<b>Working Capital:</b>					
Beginning of year .....	10,496	17,239	20,741	15,032	16,735
End of year .....	<u>\$12,240</u>	<u>\$10,496</u>	<u>\$17,239</u>	<u>\$20,741</u>	<u>\$15,032</u>
<b>Increase (Decrease) in Components of Working Capital:</b>					
Cash .....	\$ (841)	\$ 3,765	\$ 753	\$ 778	\$ 92
Marketable securities .....	(648)	(921)	427	(166)	(4,826)
Notes receivable .....	—	—	(6,200)	6,200	—
Accounts receivable .....	1,777	1,111	(1,222)	4,263	956
Inventories .....	913	6,666	2,444	2,126	1,596
Future tax benefits .....	215	(1,906)	1,028	(981)	1,974
Prepaid expenses and deposits .....	(320)	(6)	175	120	(136)
Notes payable and current maturities of long-term debt .....	(631)	(2,338)	(2,406)	916	12
Accounts payable .....	7,409	(13,844)	(794)	(5,455)	(1,343)
Accrued liabilities .....	(3,254)	885	1,546	(1,487)	(536)
Dividends payable .....	(243)	25	12	32	14
Accrued taxes on income .....	(2,631)	(180)	735	(637)	494
	<u>\$ 1,744</u>	<u>\$(6,743)</u>	<u>\$(3,502)</u>	<u>\$ 5,709</u>	<u>\$(1,703)</u>

See notes to financial statements.

THE RUPEL COMPANY AND SUBSIDIARIES

CONSOLIDATED STATEMENTS OF PAID-IN CAPITAL  
AND RETAINED EARNINGS

For the Five Years Ended December 31, 1979

	(In thousands)				
	1979	1978	1977	1976	1975
<i>Paid-In Capital</i>					
Beginning of year .....	\$ 1,147	\$ 989	\$ 814	\$ 236	\$ 5
Excess of cost (first-in, first-out basis) over proceeds of common stock op- tions exercised .....	(344)	—	—	—	—
Excess of the par value over the cost of preferred stock (in treasury) re- tired .....	137	158	175	578	231
End of year .....	<u>\$ 940</u>	<u>\$ 1,147</u>	<u>\$ 989</u>	<u>\$ 814</u>	<u>\$ 236</u>
<i>Retained Earnings</i>					
Beginning of year .....	\$22,680	\$25,261	\$28,214	\$26,419	\$29,579
Net earnings (loss) for the year ...	5,739	(1,698)	(2,019)	2,794	(2,048)
Dividends declared—					
Cumulative prior preferred stock—					
\$1.80 series (\$1.80 per share)	(120)	(128)	(136)	(142)	(148)
\$1.80 convertible series (\$1.80 per share) .....	(171)	(180)	(180)	(180)	(180)
5% cumulative convertible pre- ferred stock (\$5 per share) ..	(182)	(198)	(219)	(266)	(370)
Common stock (\$.20 per share in 1975, 1976, 1977, and 1978 and \$.45 per share in 1979) ..	(738)	(377)	(399)	(411)	(414)
End of year .....	<u>\$27,208</u>	<u>\$22,680</u>	<u>\$25,261</u>	<u>\$28,214</u>	<u>\$26,419</u>

See notes to financial statements.



THE RUPEL COMPANY

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

NOTE (1) Summary of Accounting Policies

Principles of Consolidation

The accompanying consolidated financial statements include all operating subsidiaries of the RupeL Company. Intercompany accounts and transactions have been eliminated in consolidation.

Marketable Securities

Marketable securities are included in the accompanying consolidated balance sheets at the lower of cost or market.

Intangible Assets

The excess of the company's investment over the underlying book value of net assets of subsidiaries purchased is being amortized over forty years. The amounts are included in other assets.

Investment Tax Credit

The company utilizes the flow-through method of recognizing investment tax credits in income in the year realized for tax purposes.

Inventories

All inventories are determined by physical count and are priced at the lower first-in, first-out cost or market. Finished goods inventory includes material, labor, and manufactured overhead.

Depreciation and Amortization

Depreciation provisions, based on estimated useful lives from the dates of acquisition, are computed on the straight-line method for financial reporting purposes. Leasehold improvements are being amortized over the lives of the respective leases.

For tax purposes, the company uses accelerated depreciation methods; resulting deferred federal income taxes are reflected as such in the financial statements.

NOTE (2) Notes Payable to Bank

The company has an informal compensating balance agreement with one of its banks and is expected to maintain average compensating balances of 10% of the line of credit (\$1,500,000).

NOTE (3) Long-term Liabilities

Annual maturities on indebtedness for the next four years are: \$3,459,000; \$3,237,000; \$3,024,000; \$2,512,000.

NOTE (4) Contingencies

The company is a defendant in several actions arising out of its business. Such suits are not uncommon. These suits typically seek large amounts in damages. Management believes that the company has meritorious defenses, is vigorously opposing each action, and in several cases has filed counterclaims, but management is unable at this time to estimate the ultimate aggregate liability of recovery, if any, of the company therefrom.

NOTE (5) Stock Options

Under the company's stock option plans, officers and key employees may be granted options to purchase the company's common stock at the fair market value at the date of grant. Options generally become exercisable six months after date of grant and expire five years after date of grant.

QUESTIONS - PART A

1. In terms of their fair presentation, what degree of confidence do you have in the financial statements presented?

No  
Confidence

A Great Deal  
of Confidence



Ans. \_\_\_\_\_

2. What degree of confidence do you have that the income statements fairly report the results of operations?

No  
Confidence

A Great Deal  
of Confidence



Ans. \_\_\_\_\_

3. What degree of confidence do you have that the income statements present a realistic representation of management's ability to utilize resources effectively?

No  
Confidence

A Great Deal  
of Confidence



Ans. \_\_\_\_\_

4. What degree of confidence do you have that the balance sheets fairly report financial position?

No  
Confidence

A Great Deal  
of Confidence



Ans. \_\_\_\_\_

5. What degree of confidence do you have that the balance sheet is a good representation of how management has safeguarded assets?

No  
Confidence

A Great Deal  
of Confidence



Ans. \_\_\_\_\_

6. How confident are you that management maintained a system of internal control adequate to prepare financial statements in accordance with generally accepted accounting principles?

No  
Confidence

A Great Deal  
of Confidence



Ans. \_\_\_\_\_

7. What is the likelihood that you would invest in this company?

No  
Confidence

A Great Deal  
of Confidence



Ans. \_\_\_\_\_

Part B

ADDITIONAL INFORMATION

Management's Responsibility for Financial Statements

The consolidated financial statements presented in this report are the responsibility of management and have been prepared to conform with generally accepted accounting principles consistently applied. Statement amounts include estimates resulting from management's analysis and evaluation based upon current knowledge.

The responsibility of our independent auditors, Arthur Auditor & Company, is limited to an expressed opinion on the fairness of the financial statements. The auditor's evaluation procedures include a review of systems and control procedures and testing deemed necessary to give reasonable assurance that our financial statements are not materially misleading or inaccurate. Other information included in this report is the Rupel Company's responsibility and is believed to be consistent with the financial representations.

To ensure that assets are safeguarded from loss due to unauthorized use or disposition and that accounting information is reliable, we maintain a system of accounting and corporate policies, procedures, and internal controls. Managers are carefully selected and trained; and high standards are maintained in accounting and administration and in formal policies and procedures. To reflect changing business conditions and reporting requirements, we continually modify and improve our policies, procedures and controls. We believe our system provides reasonable assurance that assets are safeguarded and that financial information is reliable.

Our board of directors discharges its responsibilities for adequate internal controls and accurate financial information with the assistance of an audit committee composed of nonmanagement board members. The committee meets with the company's independent auditors to evaluate management's performance in maintaining adequate accounting procedures and reporting processes, as well as other matters. The independent auditors have access to the audit committee and they meet (with and without management being present) to discuss the results of their examinations and to express opinions on internal controls and financial reporting.

The company has also developed and is presently implementing "Guidelines for Good Management Practices and Business Conduct." All employees are expected to understand and comply with these guidelines and to conduct the Rupel Company business throughout the world accordingly. We believe these guidelines will help assure that operations are conducted in compliance with laws and regulations and at the highest moral and ethical standards in all parts of the world.

Clyde T. Billingshe  
Vice President-Finance  
The Rupel Company

ADDITIONAL INFORMATION

Independent Accountant's Report  
on Internal Accounting Control

To the Board of Directors and  
Shareholders of The Rupel Company:

We have made a study and evaluation of the system of internal accounting control of The Rupel Company and subsidiaries in effect at December 31, 1979. Our study and evaluation was conducted in accordance with standards established by the American Institute of Certified Public Accountants.

The management of The Rupel Company is responsible for establishing and maintaining a system of internal accounting control. In fulfilling this responsibility, estimates and judgments by management are required to assess the expected benefits and related costs of control procedures. The objectives of a system of internal accounting control are to provide management with reasonable, but not absolute, assurance that assets are safeguarded against loss from unauthorized use or disposition and that transactions are executed in accordance with management's authorization and recorded properly to permit the preparation of financial statements in accordance with generally accepted accounting principles.

It should be recognized that, because of inherent limitations in any system of internal accounting control, errors or irregularities may occur and not be detected. In addition, projection of any evaluation of the system to future periods is subject to the risk that procedures may become inadequate because of changes in conditions and that the degree of compliance with the procedures may deteriorate.

In our opinion, the system of internal accounting control of The Rupel Company and subsidiaries in effect at December 31, 1979, taken as a whole, was sufficient to meet the objectives stated above insofar as those objectives pertain to the prevention or detection of errors or irregularities in amounts that would be material in relation to the consolidated financial statements.

Arthur Auditor & Co.

QUESTIONS - PART B

Based upon the financial statements in Part A and upon the additional information you have just received, carefully reevaluate your responses to the following questions. You may look back to Part A, but do not change your original response.

1. In terms of their fair presentation, what degree of confidence do you have in the financial statements presented?

No  
Confidence

A Great Deal  
of Confidence



Ans. \_\_\_\_\_

2. What degree of confidence do you have that the income statements fairly report the results of operations?

No  
Confidence

A Great Deal  
of Confidence



Ans. \_\_\_\_\_

3. What degree of confidence do you have that the income statements present a realistic representation of management's ability to effectively utilize resources?

No  
Confidence

A Great Deal  
of Confidence



Ans. \_\_\_\_\_

4. What degree of confidence do you have that the balance sheets fairly report financial position?

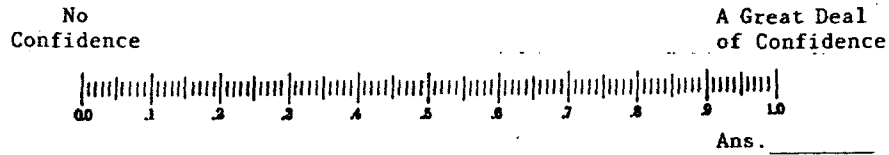
No  
Confidence

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of Confidence

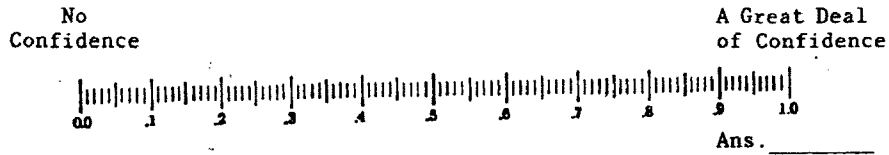


Ans. \_\_\_\_\_

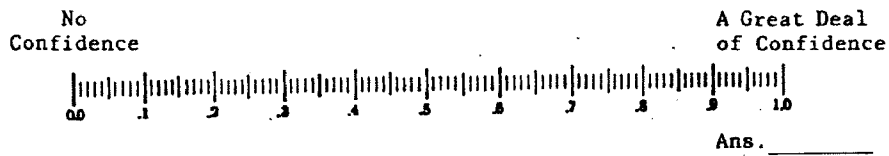
5. What degree of confidence do you have that the balance sheet is a good representation of how management has safeguard assets?



6. How confident are you that management maintained a system of internal control adequate to prepare financial statements in accordance with generally accepted accounting principles?



7. What is the likelihood that you would invest in this company?



BACKGROUND QUESTIONS

1. Age: \_\_\_\_\_ years
2. Highest level of education:
- \_\_\_\_\_ High School
- \_\_\_\_\_ 2 Years College
- \_\_\_\_\_ 4 Years College
- \_\_\_\_\_ More than 4 years college
3. Approximately how many companies have you investigated during the past year?
- \_\_\_\_\_ Companies
4. Number of years employed as a FA?
- \_\_\_\_\_ Years

APPENDIX C

CONTROL GROUP QUESTIONNAIRE:  
UNRELATED ADDITIONAL INFORMATION



UNIVERSITY OF SOUTHERN CALIFORNIA  
SCHOOL OF BUSINESS ADMINISTRATION  
UNIVERSITY PARK  
LOS ANGELES, CALIFORNIA 90007

SCHOOL OF ACCOUNTING

Thank you in advance for taking part in our study. We are conducting a research project at the School of Accounting of the University of Southern California to study the relationship between accounting data and decision making. As a member of a very select group of decision makers, your input is very valuable in our research.

The task you are about to undertake is an experiment in decision making. The experiment is expected to take about 25 minutes to complete. Assume that the financial statements presented are those of a company you are considering as an investment. Analyze the information presented to you just as you do when making an investment decision. Please feel free to utilize calculators in your analysis.

Your responses will be held in the strictest confidence. All questionnaires will be handled on an anonymous basis and individual results will not be reported in the research findings. Thank you once again for your participation.

Sincerely,

Doyle Z. Williams  
Professor and Dean

Ralph B. Williams  
Lecturer

### INTRODUCTION

The experiment has two parts: Part A and Part B. Do not review the questions in Part A until you have completed the analysis of the financial statements presented in that part. When all questions have been answered in Part A, go on to Part B. In order to answer the questions in Part B, you may refer to the information in Part A. However, do not change any of your responses to the questions in Part A.

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Westfield, Illinois,  
April 30, 1980

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Prepaid expenses and deposits	737	1,057
<b>Total current assets</b>	<u>\$ 56,341</u>	<u>\$ 55,245</u>
<b>Other Assets</b>	<u>\$ 1,428</u>	<u>\$ 1,319</u>
<b>Plant and Equipment, including rights to leased property at cost:</b>		
Land	\$ 3,328	\$ 3,311
Buildings and improvements	35,659	33,425
Machinery and equipment	73,812	69,424
Delivery equipment	21,307	22,176
Construction in progress	1,268	1,778
	<u>\$135,374</u>	<u>\$130,114</u>
Less—Accumulated depreciation, amortization and provisions for plant closings and idle equipment	83,639	81,569
	<u>\$ 51,735</u>	<u>\$ 48,545</u>
	<u>\$109,504</u>	<u>\$105,109</u>

See notes to financial statements.

THE RUPEL COMPANY AND SUBSIDIARIES

**CONSOLIDATED BALANCE SHEETS**

December 31, 1979 and December 31, 1978

LIABILITIES AND STOCKHOLDERS' EQUITY

	(In thousands)	
	1979	1978
<b>Current Liabilities:</b>		
Notes payable (including \$1,625,000 in 1979 and \$2,200,000 in 1978 payable to banks) (Note 2) .....	\$ 2,863	\$ 2,200
Current maturities of long-term debt (Note 3) .....	3,459	3,491
Accounts payable .....	23,632	31,041
Accrued liabilities .....	10,887	7,633
Accrued taxes on income .....	2,811	180
Dividends payable .....	449	204
<b>Total current liabilities</b> .....	<u>\$ 44,101</u>	<u>\$ 44,749</u>
<b>Long-Term Liabilities, less current maturities</b> .....	<u>\$ 20,299</u>	<u>\$ 19,246</u>
<b>Deferred Income Taxes (Note 1)</b> .....	<u>\$ 1,406</u>	<u>\$ 1,954</u>
<b>Contingencies and Commitments</b>		
<b>Stockholders' Equity</b>		
Cumulative prior preferred stock— authorized 200,000 shares—		
\$1.80 series, stated at liquidating value of \$35 per share; outstanding 65,116 shares in 1979 and 69,817 shares in 1978 .....	\$ 2,279	\$ 2,444
\$1.80 convertible series, stated at par value of \$25 per share; outstanding 90,000 shares in 1979 and 95,000 shares in 1978 ....	2,250	2,375
5% cumulative convertible preferred stock, \$100 par value; authorized 140,000 shares; outstanding 35,476 shares in 1979 and 37,609 shares in 1978 .....	3,548	3,761
Common stock, no par value; authorized 5,000,000 shares; issued 2,087,464 shares in 1979 and 1978 .....	9,087	9,087
Paid-in capital .....	940	1,147
Retained earnings .....	27,208	22,680
	<u>\$ 45,312</u>	<u>\$ 41,494</u>
<b>Less—Common stock held in treasury, at cost; 424,718 shares in 1979 and 484,238 shares in 1978</b> .....	1,614	2,334
	<u>\$ 43,698</u>	<u>\$ 39,160</u>
	<u>\$109,504</u>	<u>\$105,109</u>

See notes to financial statements.

THE RUPEL COMPANY AND SUBSIDIARIES  
**CONSOLIDATED STATEMENTS OF OPERATIONS**  
For the Five Years Ended December 31, 1979

	(In thousands, except per share data)				
	1979	1978	1977	1976	1975
Net sales .....	\$417,243	\$398,550	\$345,574	\$331,358	\$330,099
Costs and expenses:					
Cost of products sold (Note 1) .....	\$239,145	\$239,121	\$197,980	\$182,096	\$183,433
Selling, delivery, general and administrative expenses .....	161,240	153,023	143,681	140,880	138,973
Depreciation and amortization .....	7,312	7,280	7,114	6,745	7,026
Interest expense .....	1,826	2,001	1,566	1,052	847
	<u>\$409,523</u>	<u>\$401,425</u>	<u>\$350,341</u>	<u>\$330,773</u>	<u>\$330,279</u>
Earnings (loss) before income taxes and extraordinary items .....					
	\$ 7,720	\$ (2,875)	\$ (4,767)	\$ 585	\$ (180)
Income taxes					
Current .....	\$ 4,764	\$ 323	\$ (1,536)	\$ 234	\$ 262
Deferred .....	(763)	(1,500)	(627)	178	(171)
Investment credit realized .....	(2,020)	—	(585)	—	—
	<u>\$ 1,981</u>	<u>\$ (1,177)</u>	<u>\$ (2,748)</u>	<u>\$ 412</u>	<u>\$ 91</u>
Earnings (loss) before extraordinary items .....	\$ 5,739	\$ (1,698)	\$ (2,019)	\$ 173	\$ (271)
Extraordinary items, net of tax .....	—	—	—	2,621	(1,777)
Net earnings (loss) .....	\$ 5,739	\$ (1,698)	\$ (2,019)	\$ 2,794	\$ (2,048)
Dividends declared on preferred stock .....	(473)	(506)	(535)	(588)	(698)
Net earnings (loss) applicable to common stock .....	<u>\$ 5,266</u>	<u>\$ (2,204)</u>	<u>\$ (2,554)</u>	<u>\$ 2,206</u>	<u>\$ (2,746)</u>
Weighted average common shares outstanding .....	1,622	1,967	2,001	2,061	2,065
Earnings (loss) per common share					
Assuming no dilution—					
Before extraordinary items .....	\$ 3.25	\$ (1.12)	\$ (1.28)	\$ (.20)	\$ (.47)
Extraordinary items, net of tax .....	—	—	—	1.27	(.86)
Net earnings (loss) .....	<u>\$ 3.25</u>	<u>\$ (1.12)</u>	<u>\$ (1.28)</u>	<u>\$ 1.07</u>	<u>\$ (1.33)</u>
Assuming full dilution—					
Before extraordinary items .....	\$ 2.72	\$ (1.12)	\$ (1.28)	\$ (.20)	\$ (.47)
Extraordinary items, net of tax .....	—	—	—	1.07	(.86)
Net earnings (loss) .....	<u>\$ 2.72</u>	<u>\$ (1.12)</u>	<u>\$ (1.28)</u>	<u>\$ .87</u>	<u>\$ (1.33)</u>

See notes to financial statements.

THE RUPEL COMPANY AND SUBSIDIARIES  
**CONSOLIDATED STATEMENTS OF CHANGES  
 IN FINANCIAL POSITION**

For the Five Years Ended December 31, 1979

	(In Thousands)				
	1979	1978	1977	1976	1975
<b>Sources of Working Capital:</b>					
Net earnings (loss) before extraordinary items .....	\$ 3,739	\$(1,698)	\$(2,019)	\$ 173	\$ (271)
Add (Deduct) items not affecting working capital—					
Depreciation and amortization .....	7,312	7,280	7,114	6,745	7,026
Deferred income taxes .....	(763)	(1,500)	(1,135)	373	13
Provisions for closed plants and idle equipment .....	789	1,315	372	—	—
Working capital provided from operations, exclusive of extraordinary items .....	\$13,077	\$ 5,397	\$ 4,332	\$ 7,291	\$ 6,768
Property dispositions, including in 1977 extraordinary gain on sale of four plants .....	976	1,431	2,023	7,107	256
Proceeds from stock options exercised .....	376	—	—	—	162
Additions to long-term liabilities .....	6,488	4,502	2,200	10,099	1,500
	<u>\$20,917</u>	<u>\$11,330</u>	<u>\$ 8,555</u>	<u>\$24,497</u>	<u>\$ 8,686</u>
<b>Applications of Working Capital:</b>					
Goodwill resulting from acquisition .....	\$ —	\$ —	\$ —	\$ 342	\$ 664
Reduction of long-term debt .....	5,435	4,474	1,411	3,451	1,857
Additions to plant and equipment .....	11,778	8,945	6,461	9,251	5,686
Dividends declared .....	1,211	883	934	999	1,112
Purchase of stock, since retired					
Cumulative prior preferred, \$1.80 series .....	91	79	103	65	85
5% cumulative convertible preferred .....	150	342	451	1,686	285
Purchase of common stock for the treasury .....	—	1,176	642	303	—
Redemption of cumulative prior preferred, \$1.80 con- vertible series .....	125	125	—	—	—
Charges incurred relating to closed plants .....	489	1,010	1,164	2,212	707
Settlement of antitrust litigation .....	—	—	—	400	50
Other items, net .....	(106)	1,039	891	78	(57)
	<u>\$19,173</u>	<u>\$18,073</u>	<u>\$12,057</u>	<u>\$18,788</u>	<u>\$10,389</u>
Increase (Decrease) in Working Capital .....	\$ 1,744	\$(6,743)	\$(3,502)	\$ 5,709	\$(1,703)
<b>Working Capital:</b>					
Beginning of year .....	10,496	17,239	20,741	15,032	16,735
End of year .....	<u>\$12,240</u>	<u>\$10,496</u>	<u>\$17,239</u>	<u>\$20,741</u>	<u>\$15,032</u>
<b>Increase (Decrease) in Components of Working Capital:</b>					
Cash .....	\$ (841)	\$ 3,765	\$ 753	\$ 778	\$ 92
Marketable securities .....	(648)	(921)	427	(166)	(4,826)
Notes receivable .....	—	—	(6,200)	6,200	—
Accounts receivable .....	1,777	1,111	(1,222)	4,263	956
Inventories .....	913	6,666	2,444	2,126	1,596
Future tax benefits .....	215	(1,906)	1,028	(981)	1,974
Prepaid expenses and deposits .....	(320)	(6)	175	120	(136)
Notes payable and current maturities of long-term debt .....	(631)	(2,338)	(2,406)	916	12
Accounts payable .....	7,409	(13,844)	(794)	(5,455)	(1,343)
Accrued liabilities .....	(3,254)	885	1,546	(1,487)	(536)
Dividends payable .....	(245)	25	12	32	14
Accrued taxes on income .....	(2,631)	(180)	735	(637)	494
	<u>\$ 1,744</u>	<u>\$(6,743)</u>	<u>\$(3,502)</u>	<u>\$ 5,709</u>	<u>\$(1,703)</u>

See notes to financial statements.

THE RUPEL COMPANY AND SUBSIDIARIES

CONSOLIDATED STATEMENTS OF PAID-IN CAPITAL  
AND RETAINED EARNINGS

For the Five Years Ended December 31, 1979

	(In thousands)				
	1979	1978	1977	1976	1975
<i>Paid-In Capital</i>					
Beginning of year .....	\$ 1,147	\$ 989	\$ 814	\$ 236	\$ 5
Excess of cost (first-in, first-out basis) over proceeds of common stock options exercised .....	(344)	—	—	—	—
Excess of the par value over the cost of preferred stock (in treasury) retired .....	137	158	175	578	231
End of year .....	<u>\$ 940</u>	<u>\$ 1,147</u>	<u>\$ 989</u>	<u>\$ 814</u>	<u>\$ 236</u>
<i>Retained Earnings</i>					
Beginning of year .....	\$22,680	\$25,261	\$28,214	\$26,419	\$29,579
Net earnings (loss) for the year ...	5,739	(1,698)	(2,019)	2,794	(2,048)
Dividends declared—					
Cumulative prior preferred stock—					
\$1.80 series (\$1.80 per share)	(120)	(128)	(136)	(142)	(148)
\$1.80 convertible series (\$1.80 per share) .....	(171)	(180)	(180)	(180)	(180)
5% cumulative convertible preferred stock (\$5 per share) ..	(182)	(198)	(219)	(266)	(370)
Common stock (\$.20 per share in 1975, 1976, 1977, and 1978 and \$.45 per share in 1979) ..	(738)	(377)	(399)	(411)	(414)
End of year .....	<u>\$27,208</u>	<u>\$22,680</u>	<u>\$25,261</u>	<u>\$28,214</u>	<u>\$26,419</u>

See notes to financial statements.



THE RUPEL COMPANY

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

NOTE (1) Summary of Accounting Policies

Principles of Consolidation

The accompanying consolidated financial statements include all operating subsidiaries of the RupeL Company. Intercompany accounts and transactions have been eliminated in consolidation.

Marketable Securities

Marketable securities are included in the accompanying consolidated balance sheets at the lower of cost or market.

Intangible Assets

The excess of the company's investment over the underlying book value of net assets of subsidiaries purchased is being amortized over forty years. The amounts are included in other assets.

Investment Tax Credit

The company utilizes the flow-through method of recognizing investment tax credits in income in the year realized for tax purposes.

Inventories

All inventories are determined by physical count and are priced at the lower first-in, first-out cost or market. Finished goods inventory includes material, labor, and manufactured overhead.

Depreciation and Amortization

Depreciation provisions, based on estimated useful lives from the dates of acquisition, are computed on the straight-line method for financial reporting purposes. Leasehold improvements are being amortized over the lives of the respective leases.

For tax purposes, the company uses accelerated depreciation methods; resulting deferred federal income taxes are reflected as such in the financial statements.

NOTE (2) Notes Payable to Bank

The company has an informal compensating balance agreement with one of its banks and is expected to maintain average compensating balances of 10% of the line of credit (\$1,500,000).

NOTE (3) Long-term Liabilities

Annual maturities on indebtedness for the next four years are: \$3,459,000; \$3,237,000; \$3,024,000; \$2,512,000.

NOTE (4) Contingencies

The company is a defendant in several actions arising out of its business. Such suits are not uncommon. These suits typically seek large amounts in damages. Management believes that the company has meritorious defenses, is vigorously opposing each action, and in several cases has filed counterclaims, but management is unable at this time to estimate the ultimate aggregate liability of recovery, if any, of the company therefrom.

NOTE (5) Stock Options

Under the company's stock option plans, officers and key employees may be granted options to purchase the company's common stock at the fair market value at the date of grant. Options generally become exercisable six months after date of grant and expire five years after date of grant.

QUESTIONS - PART A

1. In terms of their fair presentation, what degree of confidence do you have in the financial statements presented?

No  
Confidence

A Great Deal  
of Confidence



Ans. \_\_\_\_\_

2. What degree of confidence do you have that the income statements fairly report the results of operations?

No  
Confidence

A Great Deal  
of Confidence



Ans. \_\_\_\_\_

3. What degree of confidence do you have that the income statements present a realistic representation of management's ability to utilize resources effectively?

No  
Confidence

A Great Deal  
of Confidence



Ans. \_\_\_\_\_

4. What degree of confidence do you have that the balance sheets fairly report financial position?

No  
Confidence

A Great Deal  
of Confidence



Ans. \_\_\_\_\_

5. What degree of confidence do you have that the balance sheet is a good representation of how management has safeguarded assets?

No  
Confidence

A Great Deal  
of Confidence



Ans. \_\_\_\_\_

6. How confident are you that management maintained a system of internal control adequate to prepare financial statements in accordance with generally accepted accounting principles?

No  
Confidence

A Great Deal  
of Confidence



Ans. \_\_\_\_\_

7. What is the likelihood that you would invest in this company?

No  
Confidence

A Great Deal  
of Confidence



Ans. \_\_\_\_\_

## PART B

### ADDITIONAL INFORMATION

Most research studies are conducted in order to answer an underlying question. The research question is typically presented in the statement of purpose of the article, immediately following the review of the literature. To answer the research question, data are collected and analyzed with one or more statistical procedures. Thus, the statistical analysis of the research study can be thought of as a stepping stone which the researcher uses in crossing a stream from one bank (the question) to the other bank (the answer).

Although there are hundreds of different statistical techniques used to analyze data, they all can be classified into one of two categories. Statistical procedures that do nothing more than summarize large groups of numbers are called descriptive statistics, since they are designed solely to describe the characteristics of a large group of numbers.

The second category of statistical techniques involves procedures that are called inferential statistics. By using these techniques, the researcher can go beyond a simple description of the numbers he obtains to more generalized statements. The researcher obtains the numbers he uses from a group of subjects which is called the sample. The sample is thought of as having come from a larger group which is called the population. Although the researcher is interested in the characteristics of the population, he only has information (data) from the sample. With inferential statistics, the researcher uses the sample data to make scientific guesses (i.e., inferences) about the population.

QUESTIONS - PART B

Based upon the financial statements in Part A and upon the additional information you have just received, carefully reevaluate your responses to the following questions. You may look back to Part A, but do not change your original response.

1. In terms of their fair presentation, what degree of confidence do you have in the financial statements presented?

No  
Confidence

A Great Deal  
of Confidence



Ans. \_\_\_\_\_

2. What degree of confidence do you have that the income statements fairly report the results of operations?

No  
Confidence

A Great Deal  
of Confidence



Ans. \_\_\_\_\_

3. What degree of confidence do you have that the income statements present a realistic representation of management's ability to effectively utilize resources?

No  
Confidence

A Great Deal  
of Confidence



Ans. \_\_\_\_\_

4. What degree of confidence do you have that the balance sheets fairly report financial position?

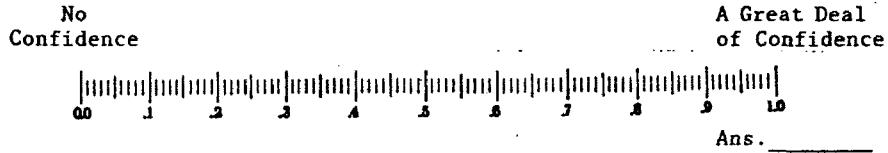
No  
Confidence

A Great Deal  
of Confidence

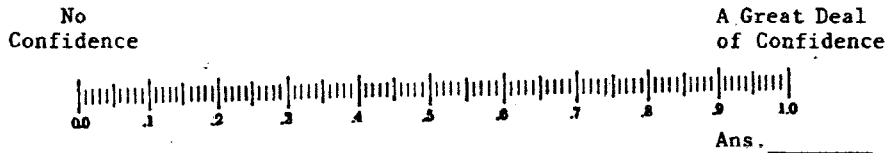


Ans. \_\_\_\_\_

5. What degree of confidence do you have that the balance sheet is a good representation of how management has safeguard assets?



6. How confident are you that management maintained a system of internal control adequate to prepare financial statements in accordance with generally accepted accounting principles?



7. What is the likelihood that you would invest in this company?



BACKGROUND QUESTIONS

1. Age: \_\_\_\_\_ years

2. Highest level of education:

\_\_\_\_\_ High School  
\_\_\_\_\_ 2 Years College  
\_\_\_\_\_ 4 Years College  
\_\_\_\_\_ More than 4 years college

3. Approximately how many companies have you investigated during the past year?

\_\_\_\_\_ Companies

4. Number of years employed as a FA?

\_\_\_\_\_ Years