Empirical Forecasting Experience and Formulation of Related Audit Standards.

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EMPIRICAL FORECASTING EXPERIENCE AND FORMULATION
OF RELATED AUDIT STANDARDS

A DISSERTATION

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

in

The Department of Accounting

by

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B.S., Louisiana State University, 1971
M.B.A., Louisiana State University, 1973
December, 1975
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# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>LIST OF EXHIBITS</th>
<th>vii</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABSTRACT</td>
<td>ix</td>
</tr>
</tbody>
</table>

## CHAPTER

### I. INTRODUCTION

- Nature of the Problem ........................................ 2
- Objectives of Financial Reporting ............................. 3
- The User Viewpoint .............................................. 6
- The Corporation Viewpoint ..................................... 8
- Forecasts in the United Kingdom ................................ 9
- Forecasting in the United States ............................... 11
- Forecasting Models and Techniques ............................. 15
- Purpose of the Study ............................................ 16
- Research Methods ................................................ 19
- Contribution of the Study ..................................... 21
- Related Research Efforts ...................................... 22
- Scope Limitations ............................................... 23
- Organization of the Study ..................................... 24

### II. REVIEW OF THE FORECASTING ENVIRONMENT

- Objectives of Financial Statements ............................ 26
- AICPA Study Group .............................................. 27
- Other Accounting Studies ....................................... 28
- The User Viewpoint ..............................................
  - Inadequate Reporting Guidelines .......................... 31
  - Corporate Forecasting Accuracy ............................ 32
  - User Competence ............................................. 34
  - Benefits for Decision Making ............................... 35
  - Potential Short-Run Emphasis ............................... 36
  - Summary of the User Viewpoint ............................. 37
- The Corporation Viewpoint .....................................
  - Legal Liability ................................................ 38
  - Competitor Advantage ....................................... 39
  - Cost of Forecast Disclosure ................................ 39
  - Other Management Considerations .......................... 41
  - Economic Considerations .................................... 42
  - Summary of the Corporate Viewpoint ....................... 43
### Public Accounting Viewpoint

Arguments Against Attestation
- Competence in evaluating forecasts
- Inability to evaluate management assumptions
- Lack of forecast auditing standards
- Lack of forecast reporting principles
- Independence of the CPA
- Legal liability of the CPA
- Public misunderstanding of auditing

Arguments in Favor of Attestation

Recent Opinion Surveys on Forecasting

Chapter Summary

### DEVELOPMENTS IN FORECAST DISCLOSURE

Forecasts by Security Analysts

SEC Regulations Concerning Forecasts
- Projection Disclosure Policies
- Corporate Liability for Projections
- Distinction Between Fact and Opinion

Case of Fuqua Industries, Inc
- Analysis of 1973 Forecast
  - Changes in corporate structure
  - Comparison of earnings per share
- Analysis of 1974 Forecast

Forecasts in the United Kingdom

Forecasts in Security Documents
- Accountants' Liability for Forecasts

Chapter Summary

### MODELS FOR FINANCIAL FORECASTING

Summarized History of Forecasting

Early Development of Forecasting

Forecasts for Business Use

Complex Forecasting Models

Models and Validation Procedures
- Model Components
- Model Validation
- Corporate Models

Financial Planning Model -- Delphi XX
- Data Input for Delphi XX
- Outputs and Uses of Delphi XX

Case of Communications Industries, Inc
- Company Background
- Validation of Forecasting Model
- Computer-Based Forecasts

Chapter Summary
### V. ANALYSIS OF AN EMPIRICAL FORECAST EXPERIENCE

<table>
<thead>
<tr>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organization of Communications Industries, Inc.</td>
<td>127</td>
</tr>
<tr>
<td>Company Background</td>
<td>127</td>
</tr>
<tr>
<td>Company Divisions</td>
<td>128</td>
</tr>
<tr>
<td>Industry and Competition</td>
<td>131</td>
</tr>
<tr>
<td>Budgetary Planning System</td>
<td>134</td>
</tr>
<tr>
<td>Forecast of 1974 Operations</td>
<td>136</td>
</tr>
<tr>
<td>Forecast Assumptions and Revisions</td>
<td>139</td>
</tr>
<tr>
<td>Disclosure of Relevant Assumptions</td>
<td>140</td>
</tr>
<tr>
<td>Interim Forecast Revisions</td>
<td>143</td>
</tr>
<tr>
<td>Analysis of Forecast and Actual Results</td>
<td>147</td>
</tr>
<tr>
<td>Chapter Summary</td>
<td>149</td>
</tr>
</tbody>
</table>

### VI. FORECAST REPORTING PRINCIPLES AND AUDITING STANDARDS

<table>
<thead>
<tr>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition of Forecast</td>
<td>152</td>
</tr>
<tr>
<td>Form and Content of Published Forecasts</td>
<td>153</td>
</tr>
<tr>
<td>Basic Form Considerations</td>
<td>154</td>
</tr>
<tr>
<td>Time Period Covered</td>
<td>155</td>
</tr>
<tr>
<td>Extent of Detailed Information</td>
<td>156</td>
</tr>
<tr>
<td>Point or Range Estimates</td>
<td>157</td>
</tr>
<tr>
<td>Statement of Assumptions</td>
<td>159</td>
</tr>
<tr>
<td>Revision and Evaluation of Forecasts</td>
<td>161</td>
</tr>
<tr>
<td>Revision of Forecasts</td>
<td>161</td>
</tr>
<tr>
<td>Change in Corporate Structure</td>
<td>163</td>
</tr>
<tr>
<td>Evaluation of Actual Results</td>
<td>165</td>
</tr>
<tr>
<td>Scope of Attestation by Certified Public Accountants</td>
<td>168</td>
</tr>
<tr>
<td>Auditing Standards for Forecasts</td>
<td>170</td>
</tr>
<tr>
<td>Qualifications of Auditor</td>
<td>171</td>
</tr>
<tr>
<td>Examination of Forecasts</td>
<td>172</td>
</tr>
<tr>
<td>Reports by Independent Auditors</td>
<td>174</td>
</tr>
<tr>
<td>Chapter Summary</td>
<td>175</td>
</tr>
</tbody>
</table>

### VII. SUMMARY AND CONCLUSIONS

<table>
<thead>
<tr>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summary and Review</td>
<td>179</td>
</tr>
<tr>
<td>Objectives and Research Methods</td>
<td>180</td>
</tr>
<tr>
<td>Research objectives and limitations</td>
<td>180</td>
</tr>
<tr>
<td>Research methods</td>
<td>181</td>
</tr>
<tr>
<td>The Forecasting Environment</td>
<td>182</td>
</tr>
<tr>
<td>Objectives of financial statements</td>
<td>182</td>
</tr>
<tr>
<td>User viewpoint</td>
<td>183</td>
</tr>
<tr>
<td>Corporate viewpoint</td>
<td>184</td>
</tr>
<tr>
<td>Accounting viewpoint</td>
<td>185</td>
</tr>
<tr>
<td>Forecast Disclosure</td>
<td>187</td>
</tr>
<tr>
<td>Forecasts by security analysts</td>
<td>187</td>
</tr>
<tr>
<td>SEC regulations</td>
<td>187</td>
</tr>
<tr>
<td>Case of Fuqua Industries</td>
<td>188</td>
</tr>
<tr>
<td>United Kingdom forecasts</td>
<td>189</td>
</tr>
</tbody>
</table>
Forecasting Models ................................ 189
  History of forecasting ............................. 190
  Models and validation ................................ 190
  Delphi XX model ........................................ 191
  Case of Communications Industries ................. 191
An Empirical Forecast Experience .................. 192
  Communications Industries organization .......... 193
  Budgetary planning system .......................... 193
  Forecast of 1974 operations ......................... 194
  Forecast assumptions and revisions ............... 194
  Forecast-actual analysis ............................ 195
Reporting Principles and Auditing Standards .... 196
  Forecast definition ................................... 196
  Form and content of forecasts ..................... 197
  Revision and evaluation ............................. 198
  Scope of attestation of CPAs ....................... 198
  Forecast auditing standards ....................... 198
Conclusions and Evaluation ........................ 199
  General Conclusions ................................... 199
Areas for Additional Research ........................ 202
APPENDIX A: Major Forecasts Required in Sun Oil
  Company Model ........................................... 203
APPENDIX B: Delphi XX Data Base for Income
  Statement Validation, 1968-1972 .................... 206
APPENDIX C: Required Changes in Delphi XX Data
  Base for Income Statement Forecasts, 1969-1973 ... 219
APPENDIX D: Composite Audit Program for Profit
  and Working Capital Forecasts ....................... 221
BIBLIOGRAPHY ................................................. 226
VITA .......................................................... 233
<table>
<thead>
<tr>
<th>EXHIBITS</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1 Fuqua Industries, Inc., Computation of 1973 Forecast Revision</td>
<td>75</td>
</tr>
<tr>
<td>3.2 Fuqua Industries, Inc., Analysis of 1973 Forecast Revision</td>
<td>77</td>
</tr>
<tr>
<td>3.3 Fuqua Industries, Inc., Analysis of 1973 Earnings per Share</td>
<td>80</td>
</tr>
<tr>
<td>3.4 Fuqua Industries, Inc., Summary of 1974 Forecasts and Actual Results</td>
<td>82</td>
</tr>
<tr>
<td>4.1 Communications Industries, Inc., Comparative Trends in Budgeted and Actual Sales and Income Before Taxes, 1963-1972</td>
<td>111</td>
</tr>
<tr>
<td>4.2 Communications Industries, Inc., Actual Balance Sheet Information for 1968-1973</td>
<td>113</td>
</tr>
<tr>
<td>4.3 Communications Industries, Inc., Actual Income Statement Information for 1968-1973</td>
<td>114</td>
</tr>
<tr>
<td>4.4 Communications Industries, Inc., Cost of Goods Sold Analyses for 1968-1972</td>
<td>115</td>
</tr>
<tr>
<td>4.6 Communications Industries, Inc., Computer-Based Forecasts Compared with Actual Profit Results for 1969-1973</td>
<td>121</td>
</tr>
<tr>
<td>5.2 Communications Industries, Inc., Initial Forecast for 1974 Compared with Actual Results for 1973</td>
<td>137</td>
</tr>
</tbody>
</table>
ABSTRACT

Users of financial statements have become increasingly concerned with forecast data, especially since the 1973 SEC revocation of its ban on projections in SEC-filed documents. Forecasts are not currently published to any great extent. Independent accountants are not publicly involved with forecasts which have been released under this SEC ruling.

Three issues appeared to be most critical in the published forecast area. One objective was to investigate the usefulness of a computerized forecasting model as a supplement to or substitute for projections prepared by internal budgeting staffs. There also needs to be a wider experience base of forecasting before accountants become publicly involved with forecasts. Finally, if there is to be public involvement by accountants, forecast reporting principles and auditing standards supporting the expression of an audit opinion need to be developed.

RESEARCH METHODS

To investigate the usefulness of computerized forecasting models, the Delphi XX model was used to simulate net income for Communications Industries, Inc., from 1969 through 1973. This model relies upon financial statement structure, ratio analysis, and trend extrapolation. The generated profit forecasts were compared with actual profits to determine the relative accuracy and usefulness of the model.

A simulated forecast experience was conducted with the participation of Communications Industries. The company management provided a profit forecast for 1974 which was considered suitable for public
disclosure, although disclosure was not made. Actual results were monitored throughout the year. The actual income statement for 1974 was compared with the forecast to highlight significant variances which would have warranted explanation in public disclosure. This empirical forecast experiment added to the experience base which must be established in the area of published forecasts.

Recommended forecast reporting principles and a set of forecast auditing standards were developed. The reporting principles were based in part upon literature survey and analysis of Fuqua Industries published forecasts and annual financial statements. The auditing standards were formulated by reason, analysis of traditional auditing standards, and experience gained from the experiment with Communications Industries.

GENERAL CONCLUSIONS

Using the Delphi XX model, it was found that such computer models may be acceptable as a supplement to detailed budgetary projections. Computer-based models can produce useful forecasts if management estimates of sales and fixed expenses are accurate and if financial statement relationships are relatively constant over time. Since several budgetary estimates are required input for forecasting purposes, these models could not be a total substitute for other forms of internal budgeting.

Through the participation of Communications Industries in a simulated forecasting experience, the feasibility of forecasting was demonstrated and the experiment permitted the examination of problems and issues involved. The company provided a reasonably accurate income statement forecast for 1974 and explanations of variances between the forecast and actual results.

Forecast reporting principles are concerned with the form and content
of published forecasts, time period covered, extent of detailed information presented, use of point or range estimates, disclosure of assumptions, updating procedures, and comparison of forecasts with actual results.

Based on existing auditing standards and the nature of forecasts, nine auditing standards were recommended for qualifications of auditors, examinations of forecasts, and reports by independent auditors. Given adequate professional competence, the auditor must review the forecasting system to determine its reasonableness and extent of auditing procedures to be performed. The auditor must then accumulate sufficient evidence regarding the bases of forecast preparation. The auditor's opinion should concern reasonableness of the forecasting methodology, underlying assumptions, and presentation of information in accordance with reporting principles which are described in the forecast accountability report issued by management.
CHAPTER I

INTRODUCTION

Until about 1900, a primary objective of auditing was the detection of fraud. Through gradual change, the purpose of a corporate audit has come to be the determination of fairness of reported financial position and operating results. The principal viewpoint in corporate financial reporting still concerns the past. Stockholders, creditors, security analysts, and managers, on the other hand, are increasingly concerned with the future instead of the past. Will the firm earn an adequate profit in the future? Will it be able to repay outstanding debt? What developments does management foresee in the coming years? These questions and others can be qualitatively and quantitatively answered by analysis and interpretation of traditional financial statements and by financial forecasts.

A forecast is generally defined as an estimate of future events which is based on management plans, assumptions, and incomplete data. A financial forecast does not claim to be a perfect prediction of future events, and the imprecision of forecasts should be recognized by users. Forecasts are based on past experience and upon events which have a high probability of occurring. Forecasts present expected future performance, and this information is valuable to many users of financial statements. CPAs now lend credibility to the reporting of past events through independent audits. It is also possible that they can lend credibility to
estimates of future performance by examining the underlying assumptions and methodology of management forecasts.

No guarantees could ever be made as to the achievability of financial forecasts. This reason, however, is not sufficient for the CPA to avoid association with forecasts. In the past, there have been many audits of historical transactions which failed to uncover fraud. In these cases, it is usually recognized that the independent auditor is not a guarantor of accuracy; likewise, the accuracy of forecasts cannot be guaranteed. There is a lack of certainty in examining both past performance and projections of future results. Evidence of past performance is more verifiable, but there is also verifiable evidence which supports the formulation of future projections. Accountants are in a service profession and the needs of various financial statement users should dictate the services performed. Users have clearly asserted their need and desire for both past and future information.

**NATURE OF THE PROBLEM**

Financial forecasting has come to the forefront of accounting issues. Much discussion has occurred since 1970 concerning the practical feasibility of publishing financial forecasts. Current practice finds many corporations either making forecasts available to private security analysts or commenting upon forecasts developed by such analysts. Investors, creditors, bankers, and other users are demanding more than the traditional historical financial statements. Since forecasts for certain circumstances have been instituted in Great Britain, many accountants in the United States are investigating the rationale and reliability of published forecasts. Accordingly, many prominent accountants are advocating that the independent auditor extend the attest
function into the financial forecasting field to lend credibility to such published projections. Other accountants view publication of forecasts as theoretically sound but impractical because of legal implications and ethical considerations of the accounting profession.

Forecasting models and techniques have been used many years for budgetary purposes. The Securities and Exchange Commission (SEC) has taken the position of allowing voluntary publication of forecasts. Some firms, such as Fuqua Industries, have taken a leading role and have published forecasts. Before auditors can be associated with forecasts, the issue of what they would be attesting to must be clarified. Achievability would not be the basis for attestation, but the auditor would examine the underlying assumptions and procedural development of quantitative financial amounts with regard to reasonableness.

Some major issues in forecasts include whether the relevance of forecasts would overcome the lack of determinable accuracy or verifiability, how the forecast would be developed, what difficulties would be encountered when dealing with published forecasts, and how an audit of the forecast by independent CPAs would be conducted. This research effort does not attempt to cover all of these issues in detail. After developing the premise that there is relevance in the publication of financial forecasts, the major concerns of this thesis will involve the development of forecasts and a forecast experience base, the form of published forecasts, and auditing standards for forecasts.

OBJECTIVES OF FINANCIAL REPORTING

The accounting profession has adopted many standards, principles, and procedures to guide the presentation of accounting information. Although some differences of opinion exist as to specific objectives of
financial statements, most professionals would agree that the basic objective is to provide information which is useful for making economic decisions.1 If a financial forecast is useful for making economic decisions, it can be concluded that the forecasted data should be disclosed to users in an appropriate financial report. Individual investors and other user groups have expressed a need for more relevant information, such as projected financial statements, to aid in decision making.2

The Study Group on the Objectives of Financial Statements, commissioned by the American Institute of CPAs, responded to the demand for usefulness by stating the following objective: "An objective of financial statements is to provide information useful for the predictive process. Financial forecasts should be provided when they will enhance the reliability of users predictions."3 Unfortunately, the Study Group did not prescribe the role of the independent auditor in connection with financial forecasts.

Freedom from bias is another established financial statement objective. Bias of different types could enter into the presentation of forecasted data. Bias has been considered by many writers who have astutely pointed out the effects of both underestimation and overestimation of forecasted profits. The temptation to publish conservative estimates


3AICPA Study Group, ..., op. cit., p. 61.
which would allow the company to continuously show favorable results would be offset by the desire to show encouraging predictions to boost common stock prices or to get a fair share of new investment funds. Overestimation would be discovered at year-end by comparison of initial forecasts with actual results. Such comparative analysis and the possibility that auditors would be attesting to forecasts and examining critical assumptions would be two checks on bias toward presenting unrealistic expectations. Companies would also realize that their ability to accurately predict profits would be noted by many investors. This publicity and exposure would tend to curtail a tendency toward intentional bias in forecasting.

With regard to the use of forecasted data generated by management, a concern of users is the objective of reliability. Moreover, the possible lack of consistency and comparability in and among firms has raised the question of whether increased information is actually provided by the forecasts. Certainly, the use of forecasted data would involve the introduction of nonverifiable information into financial statements. Verifiability has acted in the past as one of the guidelines for selection of alternate accounting methods and as a criterion for inclusion of information in traditional financial statements. Allowing published financial forecasts to be issued requires some assurance that the goals of communication and technically sound measurement are achieved even

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5Wilkinson and Doney, *op. cit.*
though the forecasted information is not verifiable by traditional means at the time forecasts are initially presented to users.

Although Arthur Andersen & Company is generally opposed to the involvement of CPAs with forecasts, one quotation from the company concerning the objectives of financial statements emphasizes the importance of publishing and attesting to forecasted data. "Only as accountants acknowledge with forthrightness that the measurement of economic data involves uncertainties, estimates and judgments will they release themselves from the rigid grip of 'objectivity' and move toward relevance, and hence, usefulness."

THE USER VIEWPOINT

One major segment of the accounting environment which should be evaluated when establishing forecasting standards and methodology is the users' needs and expectations. The user groups must be identified and their decision models must be analyzed. The decisions most relevant to their needs must be recognized, and the information necessary in meeting those decisions should be identified.

Users can be categorized into two general groups: (1) those with direct interests in the business enterprise, such as owners, creditors, suppliers, and management; and (2) those with indirect interests, such as financial analysts, stock exchanges, regulatory agencies, and the general public. This separation is only a conceptual one. It is not implied that one group is more important than the other or that the various groups do not have their own special information needs.

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An objective of corporate financial reporting is to serve the needs of users who rely on financial statements as a principal source of information about an enterprise's economic activities. This service function includes providing information which is useful for predicting, comparing, and evaluating cash flows, earning power, and management's ability to utilize enterprise resources effectively.

Any discussion of forecasting should be based on an evaluation of user needs. If information is being presented which does not meet user needs, then it should not be included in financial statements. Similarly, if certain information is so commonplace as to be general knowledge, an extended presentation of such data will be irrelevant to users. The value of information depends upon its ability to reduce uncertainty for a decision maker. Obviously, judgment is a dominant factor in determining content and presentation of any financial statement information, including forecasted data.

In identifying the information needs of individual investors, the factors which they ranked highest explicitly show that investors are primarily concerned with the future. In a recent survey, common stock investors listed the top four most important investment factors as future economic outlook of the company, quality of management, future economic outlook of related industries, and expected future growth in sales. These preferences show the importance of presenting forecasts in order to provide investors with the data they consider necessary in decision making. Although management forecasts are only estimates,

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investors are interested in this information since forecasts can eliminate much of the uncertainty which is inherent in decision making.

THE CORPORATION VIEWPOINT

Many companies are reluctant to publish financial forecasts. The underlying reasons for this reluctance include possibility of a competitive disadvantage, costs of original publication and subsequent revisions, legal risks involved, and inability to develop the forecasts because of inadequate internal budgetary planning systems. Many of these reasons were also given in the past for not publishing income statements or disclosing profits by product lines.

In reality, many companies are developing and disclosing forecast information. In 1970, a survey by the National Association of Accountants showed that 72.4 per cent of the participating companies were publicly or privately disclosing profit expectations to individual security analysts. Selective disclosure of income projections has become so widespread that the SEC now requires a filing within ten days after a company's issuing a projection to anyone. Exceptions to this filing rule include projections made in conjunction with business combinations, private financing, and initial negotiations with underwriters. After such a SEC filing, an additional report must be filed if there are material changes in the forecast or if the company decides to cease issuing projections.8

Some companies are experimenting with published forecasts. A prime example is Fuqua Industries, Inc. In a separate report published

December 28, 1972, and not attested to by the firm's auditors (Ernst & Ernst), Fuqua presented unaudited financial statements for 1972 and a forecast for 1973. The company indicated that the SEC might soon require published forecasts and that Fuqua was "willing to lead the band". The Chairman of Fuqua, in his accompanying letter, urged stockholders to read related commentary and to remember that the figures were designed to be conservative by representing minimum anticipated financial performance. Forecasted amounts appeared only for the income statement with supporting detail of revenues and earnings by product lines. Fuqua repeated this forecasting procedure at the end of 1973 by publishing a projection for 1974. The company did not, however, publish a forecast for 1975.

FORECASTS IN THE UNITED KINGDOM

At present, forecasts are published in prospectuses and takeover circulars in the United Kingdom. The independent accountant's report in a prospectus relates only to historical profits, but the accountant must give written consent to the inclusion of his report in the context that it is contained in the document. This consent implies that the accountant is satisfied with the forecast. In the case of a takeover document, however, the accountant specifically reports on the accounting bases and calculations of the forecast. If these factors are unreasonable, the accountant should qualify his opinion or withhold consent to publish the documents.

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Emphasis is continuously given to the fact that the directors of a company are solely responsible for the forecast. Responsibility of the external accountant relates to the bases of calculations, and discharge of this function implies that the forecasts are consistent with the given assumptions on which the projections are based. Unless he is satisfied that the assumptions are reasonable, the independent accountant would not publicly report on the forecast. The Chartered Accountants are in a position to advise companies about assumptions which should be listed and described in the public report, and alertness to omission of an important assumption is necessary.

Chartered Accountants have had no problems in either the area of objectivity or liability. In relation to objectivity, no additional pressures to make actual results correspond to forecasted performance have been exerted by management upon the independent accountants. Public disclosure of forecasts has not created this pressure since management accepts the forecast and related assumptions as its own responsibility. As an added checkpoint on independence, different supervisory personnel are used on forecast reviews and audits of historical financial statements.

In the area of liability, accountants in the United Kingdom do not face the same legal environment as accountants in the United States. There is less tendency toward litigation against accountants in the United Kingdom, since class action suits are not possible. The burden of proof is not placed so heavily on the defendant there, and third-party suits against accountants simply do not occur. Because of these reasons, it is difficult to compare the United Kingdom experience with accounting practice related to forecasting in this country.
FORECASTING IN THE UNITED STATES

The American Institute of CPAs (AICPA) recently conducted a survey of chartered financial analysts (CFAs), financial executives (FEs), and certified public accountants (CPAs). The proposal to encourage firms to publish a forecasted income statement on a regular basis was agreed to by 59 per cent of the CFAs and 49 per cent of the CPAs, but the proposal was rejected by 61 per cent of the FEs. With regard to adverse effects on competitive position, 68 per cent of the CFAs, 40 per cent of the FEs, and 63 per cent of the CPAs believed that there would be no harm to a company's competitive position if forecasts were published. There was general agreement, however, that investors might misinterpret forecast income statements (47 per cent, 57 per cent, and 48 per cent, respectively). The majority of respondents (67 per cent, 55 per cent, and 49 per cent) agreed that fear of losing public confidence would deter corporations from publishing overstated earnings forecasts. In terms of attitudes toward CPAs' reporting on forecasts, 40 per cent of the CFAs, 33 per cent of the CPAs, and 21 per cent of the FEs had favorable attitudes.11

The trend of recent surveys tends to indicate an increasing agreement that forecasted information is a necessary addition to the investor decision model. Financial executives, however, are still in opposition to publicly disclosed forecasts although their position seems to be weakening. Since many corporations develop forecast information and use it internally for managerial purposes, as well as occasionally distributing it to security analysts, public dissemination of the forecasts

11Asebrook and Carmichael, op. cit.
would give all investors an equal basis from which to make decisions.

One of the major reasons for the lack of CPA enthusiasm to take on the additional task of attesting to financial forecasts is the matter of potential legal liability. In recent years, accountants have been involved as defendants in many legal liability cases. This litigation has caused much reluctance to take on additional responsibilities. With regard to accountants' legal liability in attesting to forecasts, common law doctrine and securities law provide relevant legal principles. Under common law, a fraudulent misrepresentation of opinion given to influence the action of another person is basis for legal action. Fraudulence, however, is determined if the declarer knows or believes that such statements are false. Assertions based on honest intentions cannot be considered fraudulent. Case law, at present, indicates that no common law liability arises for careless opinions which do not materialize.12

Liability under the federal securities laws is based largely upon interpretations of certain terms used in the laws. Under Section 11(a) of the Securities Act of 1933 and Rule 10b-5 of the Securities Exchange Act of 1934, liability does not occur unless there is a material misrepresentation or omission of fact in the registration statements. Materiality of the item is the other basis for liability. Forecasts are considered material in that they meet the test of importance to a "reasonable" user.

The SEC has proposed a "safe harbor" provision if forecasts are published as part of traditional financial statements. This proposal

would limit corporate liability by defining conditions under which a projection which was not achieved would not be an untrue statement of material fact. Sidley and Austin, on the other hand, point out that there are many cases in which a variety of forecasts have been held as statements of fact in determining fraud. More research on specific cases would need to be done to determine if past cases would allow precedent to rule.

Another aspect to consider in relation to accounting practice in the United States is whether attestation to forecasts is essential. The American Accounting Association Committee on Basic Auditing Concepts determined that four conditions create the demand for independent performance of the attest function: (1) conflict of interest involving the possibility of biased information given to user by preparer; (2) consequence which means that information assists in decision making; (3) complexity which involves potential difficulty in understanding; and (4) remoteness involving separation between preparer and user. In relation to these criteria, the publication of forecasts would certainly involve the necessary conditions for attestation.

In another part of its report, the Committee on Basic Auditing Concepts stated that, in regard to the other criteria, the audit function

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should not be extended to forecasts. The criteria used in this instance include the following:

1. The subject matter must be susceptible to the deductions of evidential assertions... both quantifiable and verifiable.

2. An information system must be present to record the actions, events, or results thereof; preferably adequate internal controls will also be operating.

3. Consensus must exist on the established criteria against which the information prepared from the subject matter can be evaluated.16

The subject matter of forecasts is not verifiable in the traditional sense because it deals with the future. However, verifiability of underlying assumptions can be tested. Forecasted information is not produced by events that have been recorded in the historical information system, but neither is information on uncollectible accounts or other commonly acceptable estimates. Both forecasts and estimates are inferences from past data that have been recorded in the system. Finally, criteria to evaluate the subject matter of forecasts is one specific objective of this research effort.

Whatever the outcome of the forecast disclosure issue, it is certain that the large national public accounting firms will have a significant influence on the decision. Many of these public accounting firms have taken a position in regard to forecasts published in conjunction with traditional financial statements. Arthur Young & Company feels that investors should have access to financial forecasts, but that forecasts should not be included with traditional financial statements.17

16 Ibid., pp. 30-31.

and Lybrand feels that forecast publication is theoretically sound and necessary, but impractical at present.\(^{18}\) Haskins and Sells is of basically the same opinion as Lybrand in stating that the time for published financial forecasts has not yet arrived.\(^{19}\) Peat, Marwick, Mitchell & Company expressed a positive attitude toward published forecasts as well as CPA association with the forecasts.\(^{20}\)

Two national firms are opposed to published forecasts becoming a part of the accountant's role in society. Arthur Andersen & Company believes that forecasting is strictly an investing function and it should therefore be separated from accounting; however, the company is not against giving financial statement users some indication of future goals and plans of a company.\(^{21}\) Ernst & Ernst also considers forecasting to be an investment function and believes that accountants do not have the expertise to assume responsibility for projections.\(^{22}\)

**FORECASTING MODELS AND TECHNIQUES**

The issues mentioned above include the concepts of relevance versus verifiability, the relationship of forecasts to financial statement objectives, and the basic question of whether CPAs should be associated


\(^{21}\)Williams, op. cit.

\(^{22}\)Ibid.
with forecasts. In addition to these issues, there is the major question of how to develop and present forecasts intended for public disclosure. Some firms have comprehensive profit planning systems which can generate the required data. Traditional budgetary planning is applied in detail by many companies in which estimates and goals are coordinated and quantified. Before budgetary plans could be published, however, a planning budget probably would have to be adjusted to a level of reasonable expectations depending upon the original nature of the budget. Some firms set their budgets at exceedingly high or low levels of attainment from a motivational standpoint.

Most commentary on forecasting methods cites the need to identify assumptions underlying the forecasting technique. There is a vital need to be informative enough to allow users to discern bases for expectations without going into irrelevant detail or data which could injure competitive position. Some firms have no comprehensive profit planning system because of the small size of their operations or lack of internal technical ability. Perhaps reasonable forecasts can be developed for these firms by using computerized models which are based primarily on financial statement relationships and a minimum of budget estimates, such as sales volume. One such model has been developed by Arthur Young & Company. It may be possible for smaller firms to use models of this type to develop forecasts without undue expense to the company.

PURPOSE OF THE STUDY

The use of forecasts appears to be a certainty for the future. The prevalent attitude appears to be that forecasts presented in conjunction with regular financial statements would increase fulfillment of the informational needs of users. Certain obvious problems will have to be
resolved in order to maintain understandability and usefulness in the financial reporting system and to avoid confusion for the users. One basic area for research is that of identifying problems involved in actual forecasting experience. This phase leads to a second area of research in that there is not an adequate experience base in the United States upon which to build. Not only is it difficult to identify problems in publishing forecasts, but experience is also needed to develop reporting standards and auditing guidelines for involvement of CPAs. The third area of needed research is the actual development of forecasts. It is necessary to determine if detailed budgetary procedures are required for development of forecasts or if a computerized model can provide reasonable projections.

Based upon the issues which appear most critical, the objectives of this study are to:

1. Investigate the usefulness of a computerized forecasting model as a supplement to or substitute for detailed budgetary projections.

2. Provide the accounting profession with insight regarding the experience base necessary for auditing corporate financial forecasts.

3. Develop recommended forecast reporting principles and forecast auditing standards supporting the CPA's expression of an opinion on the reasonableness of corporate forecasting methodology.

Corporate financial forecasts would be facilitated in a technical sense if a financial statement simulation model could produce reasonably accurate forecasts. The Financial Planning Model (Delphi XX) of Arthur Young & Company will be used to accomplish this objective. In general, a financial statement simulator would be useful for forecasting purposes if it can generate forecasts that reasonably correspond with actual financial results reported by a company for specific past periods. The Delphi XX model produces pro forma financial statements based on
management estimates of sales growth and inputs of several financial statement ratios and relationships. Forecasts are thus produced by a process that is significantly different than traditional budgetary planning.

For a specific company, past fiscal periods will be analyzed to determine how forecasts produced by the model would have compared with actual financial results of the company for these time periods. If there is reasonable correspondence between the model forecasts and actual results, then there is reasonable evidence that such models may supplement forecasts based on traditional budgeting or perhaps provide forecasts for firms without a budgetary planning system. If the model proves useful, even with this limited validation experiment, then the lack of technical expertise and company experience in forecasting is significantly remedied.

A frequent comment on forecasting issues is that company managements and CPAs lack the required experience with forecasting to assess the potential problems involved. This experience can be gained only by practice and experimentation with forecasting. Therefore, this study will analyze and report upon an empirical forecasting experiment for the calendar year 1974. The company engaged in this experiment will prepare its 1974 consolidated budget in the usual manner which reflects actual plans and reasonably attainable expectations. Since the budgeted income statement will be based on the most likely or most probable results for the year, it will represent a forecast which would be suitable for public disclosure. Actual results for 1974 will be compared with this forecast and significant matters of assumptions, explanation of important variances, and technical forecasting problems will be addressed. This
phase of the study is called an experiment since public disclosure of the forecast will not be made. This forecasting experiment will contribute to the experience base that is currently lacking.

One problem with the public disclosure of forecasts is the lack of acceptable principles for presenting this information. There is a definite need to establish principles concerning the form and content of forecasts, revision or updating procedures, and comparison with attained results. Based upon analysis of the forecasting experience and the reporting practices which appear to be feasible and useful, a tentative set of forecast reporting principles and auditing standards will be formulated. The reporting principles are intended to serve as guides to the public issuance of forecasts, and the auditing standards for forecasts will be useful in a manner similar to traditional auditing standards which currently apply to audits of historical financial statements.

RESEARCH METHODS

The principal research method to be used in this study is the analysis of empirical evidence related to actual and simulated corporate financial forecasts. A company with actual forecast experience is Fuqua Industries, Inc., an Atlanta based firm with annual sales over $400 million. This firm published profit forecasts for 1973 and 1974 and will, at the conclusion of this study, have two years of experience in forecasting. Accordingly, actual and forecasted profits for this firm will be analyzed in relation to form, potential user misunderstanding, and variance explanations.

As a second source of empirical evidence, Communications Industries, Inc., of Dallas, Texas, will participate in a simulated profit forecast experience. This firm, with annual sales under $20 million, will develop
a consolidated profit forecast for 1974 which would be suitable, in management opinion, for public disclosure. This experience is called a simulation or an experiment only because the forecast will not be publicly disclosed. Communications Industries, Inc. (CI) has over ten years of experience in profit planning and assembles a comprehensive budget for annual planning purposes. The company has also supplied summary budget data for its operations during the ten-year period 1963-1972. This information will be used for comparative analysis with results disclosed in the firm's annual reports for those years.

In relation to the specific objectives of this study, the complete research design involves the procedures specified below.

**Objective I:** Investigate the usefulness of a computerized forecasting model as a supplement to or substitute for detailed budgetary projections.

**Research Methods**

A. Apply the Financial Planning Model (Delphi XX) to simulate net income of Communications Industries, Inc., for the five-year period, 1969-1973. Compare profits generated by this model with profits actually reported for these periods.

B. Analyze budget data of CI for the ten-year period 1964-1973 with regression analysis to determine the relative predictability of revenues, operating expenses, and income before taxes.

**Objective II:** Provide the accounting profession with insight regarding the experience base necessary for auditing corporate financial forecasts.

**Research Methods**

A. Survey the literature regarding existing corporate forecast experience, reasons for publicly disclosed forecasts, suggestions for form and content of forecasts, relationship (if any) of company auditors to forecasts, and underlying assumptions.
B. Conduct and monitor a simulated forecast experience for 1974 with Communications Industries, Inc. This project will involve the following procedures.

1. Consultation with company management to determine that the 1974 planning budget represents a consolidated profit forecast suitable for public disclosure (no public distribution will be made, however).

2. Monitoring actual operating results during 1974 through review of quarterly reports and discussion with company management. This phase will document problem areas and factors not anticipated in compiling the 1974 forecasts as well as conditions or assumptions not properly reflected in the forecast.

3. Comparison of the actual income statement for 1974 with the related forecast to determine any significant variances which would have warranted comment or explanation in public disclosures.

Objective III: Develop recommended forecast reporting principles and forecast auditing standards supporting the CPA's expression of an opinion on the reasonableness of corporate forecasting methodology.

Research Methods

A. Develop recommended forecast reporting principles for the public issuance of corporate financial forecasts. These principles will provide standards regarding the form and content of forecasts, revision and updating procedures, and comparison of forecasts with actual results. These reporting principles will be based in part on the Fuqua Industries analysis.

B. Formulate a tentative set of forecast auditing standards based upon auditing standards for historical financial statements and the empirical forecast experience with Communications Industries. These standards will be formulated by reason and experience in relation to the evidence accumulated during the forecast experiment.

CONTRIBUTION OF THE STUDY

This research effort addresses three significant issues concerning corporate financial forecasts.
1. If CPAs are to be associated with profit forecasts, there is no extensive experience base to rely upon.

2. If CPAs are to be associated with profit forecasts, there are no general standards to guide the presentation or auditing of forecasts.

3. If CPAs are associated with forecasts, the extent to which they can rely upon computer models to supplement budgetary systems or possibly substitute for budgetary systems needs to be determined.

Each issue requires experimentation and research because CPAs are not currently attesting to the reasonableness of form and methodology in the few cases of publicly disclosed forecasts. If forecasts become more numerous or even required, there is a clear need for attestation by independent CPAs based on the criteria established by the Committee on Basic Auditing Concepts of the American Accounting Association.

Accordingly, this research study will provide some of the evidence and experience background which practicing CPAs claim to be necessary. The topic is timely, of current interest, and should offer an original contribution to accounting thought.

RELATED RESEARCH EFFORTS

Recent interest in corporate financial forecasts has produced numerous professional journal articles on the topic. These papers cover all aspects of the forecasting issue from how to forecast, users' information needs, accuracy versus relevance in forecasting, ethical and legal issues pertaining to CPAs, to form of forecasts. In general, most of the published papers to date are general discussions which seek to define problems and propose solutions. Some research on predictability of operating results in various industries has been completed, but there are no detailed reports on a comprehensive forecasting experience.

Two recent doctoral dissertations in the area of forecasting have
been completed by Dan M. Guy at the University of Alabama and Robert J. Keller at Louisiana State University. Dr. Guy's research effort dealt primarily with development of an audit opinion for published forecasts, while Dr. Keller's study was a questionnaire survey of various groups' attitudes about forecasting. Neither thesis deals with the aspects of forecast development and presentation of forecasts or standards for attestation which are needed before an audit opinion can be issued.

SCOPE LIMITATIONS

This study actually builds upon the foundation of published technical articles and other dissertations. It seems that enough surveys and proposals for audit reports have been completed. As previously indicated, this study seeks to document actual experience with the forecasting issue. To this extent, there are several limitations designed to hold the study within manageable boundaries.

Data for only one company will be analyzed with the Delphi XX model because the purpose is not to validate the model or demonstrate that it has widespread applicability. The financial statement simulator is used only to determine the potential feasibility of using a model of this type for forecasting purposes.

Analyses of forecast and actual data are also limited to the income statement. Since forecast experience to date is concerned primarily with profits, detailed forecasts of funds flow, cash flow, and balance sheets will be excluded from consideration. These are all useful areas for forecasting, but present user emphasis seems to be centered on the income statement.

This study is also not concerned with specific forms of audit reports that could be used by CPAs in attesting to profit forecasts. In
relation to the other issues involved, it seems that specific report form does not demand immediate attention at this time. In addition, report form has been adequately covered in another research effort.

ORGANIZATION OF THE STUDY

The following six chapters of this research effort present an overview of the entire forecasting topic while delving into some specific problem areas. The chapters are arranged to accomplish the three primary objectives of investigating the usefulness of computerized forecasting models, providing an experience base for independent auditors, and developing tentative reporting principles and auditing standards for forecasts.

Chapter II provides a general description of the environment which produced the need for forecast publication. Viewpoints of three interested groups are presented, including results of certain published surveys. Forecasts are also examined in relation to objectives of financial statements.

Present conditions in forecast disclosure are discussed in Chapter III. One important role in the publication of forecasts is played by the Securities and Exchange Commission. A company which responded to the SEC's decision to allow published forecasts was Fuqua Industries, Inc. Fuqua's experience is reviewed in this chapter.

Forecasting models may be of many types. Chapter IV examines the history of forecasting and concepts of model validation. The usefulness of a computerized forecasting model is explored by applying a forecasting model to information provided by Communications Industries, Inc. Communications Industries, Inc., is the basis for the empirical forecasting experience analyzed in Chapter V. The company is traced
through budgetary planning, assumptions underlying the forecast, updates
during the year, and problems of variance analysis and explanation. This
chapter is an important addition to the experience base necessary in the
forecasting area.

Forecast reporting principles and auditing standards are developed
in Chapter VI. These recommendations are formulated to provide a tenta­tive set of principles and standards on which CPAs could base an audit
report. The scope of CPA attestation to forecasts is also examined.

Chapter VII contains a summary of the issues examined, problems en­
countered and conclusions reached. Previous chapter summaries are pre­
sented and synthesized. Additional areas for research are discussed so
that issues not included in this research effort due to scope limitations
may be examined and resolved in the future.
CHAPTER II

REVIEW OF THE FORECASTING ENVIRONMENT

Before an examination of forecasting techniques, reporting principles or standards of attestation can be considered, the existing environment of corporate projections must be studied. This review is necessary in order to understand why publication of forecasts in financial statements is subject to much controversial discussion. This chapter examines current attitudes about objectives of financial statements, the need for published forecasts, and viewpoints of groups concerned with forecasting. Reasons for and against forecast publication are summarized according to the viewpoints of users of financial statements, corporations which prepare and publish such statements, and independent auditors.

OBJECTIVES OF FINANCIAL STATEMENTS

If financial forecasts are to be published with other financial statements, they should serve some purpose and fulfill some objective. Many professional accounting groups have expounded on the objectives of financial statements; the most recent attempt at delineating such objectives was the Study Group on Objectives of Financial Statements which was commissioned by the American Institute of Certified Public Accountants. This group worked for more than two years and published a monograph in late 1973.
AICPA STUDY GROUP

The Study Group reached a broad general objective for financial statements which was "to provide information useful for making economic decisions." To become more specific than this objective, assumptions had to be made about the information that was considered useful to readers of financial statements. Some theoretically sound behavioral assumptions were made. Two of these assumptions were that information which helps predict, compare, or evaluate cash consequences of decisions is important to financial statement users and that factual information in financial statements should be distinguished from interpretive information. With these assumptions, barriers to providing non-historical data were relaxed considerably.

The Study Group discussed the topic of published financial forecasts. However, no absolute decision was reached on whether corporations should publish forecasts. The group's conclusion was "an objective of financial statements is to provide information useful for the predictive process. Financial forecasts should be provided when they will enhance the reliability of users' predictions." Financial statement users have a right to know management expectations in order to better predict the consequences of their own actions. The assumptions which management made to arrive at specific future expectations are also important to users. The availability of such information

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2Ibid., pp. 13-14.

3Ibid., p. 46.
would allow investors to appraise risk and investment decisions more realistically since areas of flexibility or new management plans would be known. Simple extrapolations of past data could be integrated with previously unknown plans thereby permitting more informed decisions by financial statement users.

OTHER ACCOUNTING STUDIES

The AICPA Study Group was not the only committee to concern itself with items that should be in the domain of financial statement information. The American Accounting Association in A Statement of Basic Accounting Theory enumerated four criteria to be used in the evaluation of potential accounting information. These criteria are relevance, verifiability, freedom from bias, and quantifiability. It is possible that forecasts may not satisfy the criterion of freedom from bias, since the data consist of internal information based on management perception of future operations. This condition is not enough to eliminate forecasts from consideration, because the AAA study indicates that adherence to the standards may be partial.

Forecasts are definitely relevant to the known informational needs of users. In a recent study conducted in Washington, D.C., investors ranked items about the future as four of their top six informational needs. Forecasts are considered verifiable when independent parties

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5Ibid.

using the same assumptions arrive at similar conclusions. Many assumptions could also be "verified" by market surveys or reference to other published prediction sources. Finally, forecasts are definitely quantifiable in dollar amounts.

The Accounting Principles Board has also examined the matter of financial statement objectives. APB Statement Number 4 gave as a general objective of financial statements the providing of "reliable financial information about economic resources and obligations of a business enterprise." The Statement went on to give a related objective of providing "financial information that assists in estimating the earning potential of the enterprise... Extrapolations of financial data, however, should be made only in conjunction with the best additional information available about the enterprise, its circumstances, and its prospects." It would appear that the best additional data would be determinations by management of future prospects and disclosure of the assumptions used to arrive at those determinations.

The lists of financial statement objectives prepared by various committees, study groups, and individuals have been extensive. The general conclusion reached by the majority seems to be that usefulness is the key criterion for an item to qualify for inclusion in financial statements. Unfortunately, usefulness is an individual criterion while financial statements must serve a general audience. Stockholders, prospective investors, and creditors attempt to use financial statements as

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8 Ibid., paragraph 79.
predictive devices for the future, even if they forecast the future as a simple extension of the past. Any information which helps this predictive process should be deemed useful. It seems a foregone conclusion that a forecast and its underlying assumptions would be an aid to the predictive process of users by providing insight into management expectations. Forecasts serve the objective of usefulness by providing information concerning the prospective performance of a company.

Usefulness is a noble, but vague, criterion for admission of information into the realm of financial statements. Reasons substantiating the need, or lack of need, for financial projections should be established. Profit forecasts would basically affect statement users, the issuing corporations, and independent public accountants. These three groups have expressed opinions concerning the relative merits of forecast publication.

THE USER VIEWPOINT

Many comments from users of financial information favor forecast publication. One of the first reasons cited for forecast disclosure is the present unequal distribution of corporate forecast information. Projections of future operations are often given to financial analysts without coincident disclosure to the remainder of the business community. A study by Asebrook and Carmichael of 206 financial analysts, 262 financial executives, and 396 certified public accountants found the majority (71 per cent, 86 per cent, and 84 per cent, respectively) to believe that such disclosure without simultaneous release to stockholders is biased against stockholder interests.9

Yet this unequal distribution of information is a recurring event. In a Financial Analyst Federation study of 992 analysts and portfolio managers, over 40 per cent of the respondents felt that they had obtained some type of projection for more than half of the companies in which they specialize. However, in the same study, the consensus was that about 40 per cent of the time the nonprofessionals rarely had access to management projections.¹⁰

To eliminate this type of discriminatory disclosure, the Securities and Exchange Commission (SEC) announced a ruling in 1973 that any release of a forecast requires immediate and complete disclosure to all interested parties. Forecasts and underlying assumptions must also be filed on a special form with the SEC. Considered as forecasts in this ruling are confirmations by corporate management of projections released by an outside party such as a security analyst. Such confirmations are deemed forecasts attributable to the company and as such must be filed with the Commission.¹¹

INADEQUATE REPORTING GUIDELINES

SEC involvement is considered a positive factor since it should improve the quality of forecast information which is presently disseminated. A great deal of variability exists among forecasts for a single company depending upon the source of such projections. External analysts are free to make their own assumptions, calculations, and range of estimates.


Prior to the SEC ruling, there were no guidelines or disclosure requirements for forecasts and related information prepared by either company management or security analysts.

Association of the SEC with budgetary disclosure should standardize the practice of issuing forecasts. Because underlying forecast assumptions are required to be filed by companies issuing projections, investors have the opportunity to question bases and to adjust data as they consider necessary. Under present practice, investors have no choice other than to rely on forecasts given by financial analysts because investors have no information concerning forecasting methodology or assumptions.

Harvey Kapnick of Arthur Andersen & Company is adamant in his belief that the situation of uncontrolled analyst-prepared forecasts is "untenable" and that the SEC should adopt new legislation setting standards on documentation of forecasts prepared by external investment advisors. 12 It seems to be an irrefutable fact that company management would have better knowledge of future corporate operations than any outsiders. The need to set standards for management documentation of forecasts is more necessary than setting standards for analysts.

CORPORATE FORECASTING ACCURACY

A 1972 study by the Financial Executives Research Foundation of 338 companies in varied industries found that 99 per cent of the companies prepared earnings forecasts and that 80 per cent of the forecasts came within plus or minus 15 per cent of year-end profit results while 70 per

cent of the group experienced a 10 per cent variation. Without any interim adjustment for changing conditions, 15 per cent variation appears to be a fairly accurate and reliable range for projection of annual earnings.

In another study conducted by the Financial Analysts Federation, portfolio managers gave corporate management a good rating in forecasting accuracy. The portfolio managers estimated that 50 per cent of corporate managers forecasted within a 10 per cent variation and that 92 per cent of the forecasts were within a plus or minus 20 per cent range of actual profits. Ratings by the financial analysts surveyed in this study, however, showed 38 per cent and 91 per cent confidence that management forecasts fall within the above 10 per cent and 20 per cent variance ranges, respectively.

If managements can do this well in forecasting, the real issue seems to be developing standards for preparing and disclosing forecasts by management to replace those of outside analysts. This is not to say that analysts will cease to prepare forecasts if managements release their own projections. If management discloses underlying assumptions along with publication of its projections, variations in the analysts' projections will need to indicate those assumptions with which the analysts had a difference of opinion and which caused them to arrive at a different forecast. Standards for management disclosure should therefore remedy the problem of incomplete disclosure by analysts, but developing


14 Stewart, op. cit.
disclosure standards for analysts will not help investors to know what management plans and expectations are.

USER COMPETENCE

In dealing with users, one must consider whether there exists the level of competence necessary to deal with and properly interpret forecasts. The argument is continuously raised that users will place excessive reliance on forecasts and will not realize that what is presented is not an absolutely certain indication of what will happen. This contention appears to assume that users of financial statements have less sophistication than seems to be reasonably warranted.

Institutional trading on the New York Stock Exchange in 1972 was estimated to represent approximately 70 per cent of total volume. In addition to institutional investors, there is the nonprofessional investing community which has available the advice of broker-dealers and personal investment advisors. The Baker and Haslam study determined that investors ranked brokers and advisory services as the most important sources of investment information based on 47 per cent and 16 per cent of 775 responses, respectively.

The Baker and Haslam survey seems to place the overall level of investment sophistication high enough to assume that investors will understand the difference between historical fact and a properly labeled forecast. Published forecasts should have adequate disclosure about tentativeness and should not purport in any way to be factual.

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16 Baker and Haslam, *op. cit.*, p. 68.
Professional analysts already know the limitations of forecasts. With proper disclosure and orientation, nonprofessionals can learn not to place undue reliance on projections.

BENEFITS FOR DECISION MAKING

Investment decisions generally involve buy, sell, or lend alternatives. In all cases, the important time frame is the future which creates the problem of uncertainty. Evidence has shown that lack of forecast information or use of inaccurate information leads to an inefficient flow of investment funds. Without reliable information, investors cannot accurately distinguish between efficient and inefficient companies. Publication of forecasts would help reduce uncertainty and shift the flow of investment funds to the more efficient firms. There are variations in stock and bond prices because of the uncertainty inherent in future expectations. Disclosure of budgetary information could help security prices remain within a narrow range of their real value because the information needed for predictive purposes would be more widely distributed.

The American Accounting Association Committee on External Reporting concluded that "the most relevant form of financial reporting is that which (1) reports budgets for the forthcoming period or periods," and


18 Bissell, op. cit., p. 73.
(2) makes actual-budgetary comparisons with variance explanations.\textsuperscript{19}

In order for budgetary information to be helpful in investment decisions, forecasts must be prepared in a reliable manner. This point again alludes to the need to disclose underlying assumptions and the possibility of attestation.

POTENTIAL SHORT-RUN EMPHASIS

A final aspect of the user viewpoint is the possibility of forecasts causing a much shorter range outlook for investment purposes. If forecasts are published for a one-year time frame, a substantial number of investors may become speculators who buy and sell corporate stocks thereby causing a wider spread in market prices than already exists. Price Waterhouse & Company, in \textit{The Objectives of Financial Statements} position paper, concludes that an overriding concept of investment is that it is short-range. "The stockholders' objectives, their manner of thinking, their desires are relatively short-range. Financial reporting that does not recognize this absolutely central fundamental will not be responsive to stockholders' needs."\textsuperscript{20} If the outlook is presently short-range, publication of annual forecasts will not cause any shifts in investor outlook considerations. Investment decisions are made with appropriate consideration of the uncertain future. It is not fair to investors to withhold information which could reduce this uncertainty.


simply because companies think investors should look farther ahead than one year.

SUMMARY OF USER VIEWPOINT

The user viewpoint is that publication of forecasts is essential to the investment decision which involves a short-range outlook. Preparation of projections by management is preferable to preparation by external financial analysts because all significant details will be considered and management has the ability to forecast with reasonable accuracy. Involvement by the SEC should improve the quality of forecast information by imposing standards for full disclosure to all parties and statement of underlying assumptions. These underlying bases should be published with projections so that adjustments can be made by users according to their preferences or for disagreement with specific bases. Finally, the majority of investment transactions involve institutional investors who have the training and experience to understand and use forecasts. Individual investors use or have access to brokers and analysts who are versed in the meaning and limitations of forecasts. Users have sound reasons for desiring forecasts and have definitely substantiated the usefulness of corporate financial forecasts.

THE CORPORATION VIEWPOINT

There are several important factors which should be evaluated by corporate management regarding financial forecasts. These factors include potential legal liability, competitor advantages, and cost of such disclosures. Advantages and disadvantages of forecast disclosure from the viewpoint of issuing corporations are examined in the following discussion.
LEGAL LIABILITY

Probably the major reason cited for the reluctance of companies to publish forecasts is fear of legal liability. The question which generally arises is whether a forecast is a fact or an opinion under the Securities Acts of 1933 and 1934. According to a proposed SEC ruling, "a projection is not a promise, not per se misleading if not achieved, and not a misstatement of a material fact, if reasonably based in fact, prepared with reasonable care, and carefully reviewed."21

The SEC recognizes the deterrent of liability to published forecasts and has tried to clear the way for carefully prepared forecasts without the cloud of uncertainty as to what legal action will occur if a forecast is not achieved. Surely there will be liability for those companies which use poor forecasting techniques and faulty assumptions, but liability will be minimized for companies participating in open disclosure of well-prepared projections.

Two 1971 legal precedents should reduce the controversy about legal liability. In the Monsanto Chemical case, the decision was that no liability exists if forecasts are carefully prepared but later become inaccurate because of unknown future circumstances.22 In a similar case, the U. S. District Court in New York concluded in Dolgow v. Anderson that forecasts which were carefully prepared, reviewed and believed to be accurate at the time of preparation "are not untrue statements of material facts if future uncontrollable events prove the forecast wrong,


as long as a revision is fully publicized on a timely basis."  

COMPETITOR ADVANTAGE

The second and third most frequently quoted reasons for lack of forecast publication are disclosure of competitively advantageous information and cost to the issuing corporations. Considering disclosure of information which could be to a competitor's advantage, one must realize that forecasts and related assumptions do not have to be presented in such a detailed manner as to reveal competitively advantageous information. Most businesses already know who their competitors are, what share of the market each firm in the industry holds, whether each firm is gaining or losing market share, and probably the general type of research programs which are being conducted.

As part of an American Institute of CPAs opinion survey, financial analysts, financial executives, and certified public accountants were asked if they thought publication of a forecasted income statement would reveal an undue amount of information to corporate competitors. Sixty-eight per cent of the financial analysts and 63 per cent of the CPAs did not think such disclosure would be harmful. The financial executives were split 40 per cent and 40 per cent between harmful and not harmful opinions.  

COST OF FORECAST DISCLOSURE

There are basically two costs related to published forecasts, the cost of developing an original forecast and the cost of publishing and

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24Asbrook and Carmichael, _op. cit._
updating this disclosure. Many companies do not have the internal data base of economic information which other businesses may possess, but there are many government-published forecast documents which could be used to determine industry trends, population statistics, and consumer purchasing-habit data. Some companies also may not have the benefit of expert statisticians and corporate budget departments to prepare forecasts.

It is for this last reason that many computer models have been developed. These models use trend analysis and sales forecast figures developed by the company as input to generate a forecast of the upcoming year or years. Additional information other than past financial trends can be incorporated into the model such as known or expected cost increases, changes in consumer demand, or changes in other economic factors. In this way, a company does not have to have an extensive budgeting department to prepare forecasts. Developments during the year can also be input to the analysis, and the model can provide updated forecasts without considerable expense.

The costs of printing and distributing the original forecast and subsequent updates could be substantial. However, one must weigh the cost of this process against the informational benefits which are provided. There is no reason for projections to be issued in the same manner as annual reports. Minimizing the publication costs by using black and white offset printing would be a worthwhile objective. The idea is to inform, not impress users of forecast information. Costs of updates could be reduced by issuing revisions in regular quarterly statements, if this would disclose the information on a timely basis. News releases could cover any major changes between quarterly reports.
OTHER MANAGEMENT CONSIDERATIONS

There is no longer a great deal of emphasis given to the point that companies would issue forecasts only when it was to their advantage to publicize favorable expectations. The SEC recently ruled that any discontinuance of forecasts after once publishing must be disclosed to the Commission. These reasons should be easy for interested parties to obtain, and companies that discontinued forecast publication for unsubstantiated reasons would become known in the investment community.

The last well-quoted reasons for the lack of published forecasts relate to the nature and potential actions of company management: forecasts would always be over-estimated or under-estimated; managers would be forced to achieve the forecast; and short-range objectives would be emphasized to the detriment of the company. These negative points about company managers and their behavior in relation to forecasts are not entirely valid.

Since continuous over-estimation or under-estimation of forecasted performance would be quickly noticed by investors, it is very unlikely that a company would try these tactics regularly. Statement users would adjust forecast information to a more reasonable projection based on past experience with forecast variances. If erroneous forecasts were issued, investors who relied upon the forecasts and suffered damages would sue company directors and management. Legal liability is a deterrent to intentional misstatement. Properly prepared projections which are not achieved are simply part of market uncertainty, but companies which issue forecasts that are deliberately overstated or drastically conservative would probably be subject to appropriate legal liability.
Managers who use a forecast or any type of budget as a goal which must be achieved at all costs are poor managers. All companies have some sort of budgeting system, but it is a recognized principle that managers should not expect these budgets to be met precisely. Since managers are not concerned merely with short-run objectives, the external publication of a forecast will not suddenly change this perspective. After issuing a projection, managers should perform just as they did before by seeking to achieve goals of long-run profitability and growth regardless of how this performance compares with short-run forecasts. Companies which prepare forecasts have considered the behavior of management personnel in the process of basic forecast development.

ECONOMIC CONSIDERATIONS

A final aspect under consideration for the corporate viewpoint involves the effect of economic conditions. A company in a fluctuating market or in a period of rapid inflation or recession will have difficulty in issuing and achieving a forecast. Companies at present are reluctant to speculate on the future especially in any formal or externally disclosed fashion. Internally, however, economic uncertainties do not prevent budget preparation. Budgets are continuously prepared and updated, and a formal forecast would be treated similarly. Investors in this country should realize that economic changes create uncertainties and cause adverse results for some individual companies or industries. A company which openly published and revised its forecasts in response to significant movements in the economy would create more faith in the long run than one which remained silent.
SUMMARY OF THE CORPORATE VIEWPOINT

The corporate viewpoint is basically against published financial forecasts, although the supporting reasons are not as valid as they may sound. There is likely to be no legal liability for a reasonably prepared forecast which is not achieved, but revisions of the forecast to reflect new plans or changing economic conditions will be necessary on a timely basis. The costs of preparation do not necessarily include large budget staffs, since forecasts can be developed informally or with computer models. The detail in a forecast should not be enough to disclose corporate secrets. Finally, managers should view a published forecast as a budget rather than a goal which must be achieved.

PUBLIC ACCOUNTING VIEWPOINT

The last major group affected by published forecasts is the public accounting profession. Controversy is widespread among this group because of the possibility of attestation to published earnings projections. The forecasts could also be published in conjunction with annual reports, but in this case, there will be an aura of authority surrounding the forecast publication even if no specific attestation is involved. Many of the large national accounting firms have taken a position on the subject.

Arthur Young & Company has indicated that publication of forecasts, if dependable, should be made available to investors, but not included with traditional financial statements. This position is founded on the fact that information pertaining to certain phases of operations can be predicted with some degree of reliability and that such data are material
Coopers and Lybrand has taken a positive attitude in stating that forecasts included in financial statements could be beneficial to investors, but only if the uncertainty of the projections can be clearly defined, presented, and comprehended by those making use of the forecasts. Their position is that publication is theoretically desirable, but impractical at present because of lack of proper understanding on the part of the investing community. Their proposal suggests a two-year period of research followed by a three-year period of voluntary publication to determine the difficulties experienced with publication. Lybrand is against the independent auditor's public association with forecasts because of the uncertainty involved, lack of standards on which to judge managerial assumptions, and lack of an extended period of experience in dealing with such matters. The firm does feel that public accountants could play an important part in the computation of forecasts or in the development of standards upon which forecasts could be compiled.  

Peat, Marwick, Mitchell & Company presented a position paper expressing a positive attitude toward published forecasts as well as reviewing and reporting on forecasts by certified public accountants. The company states, "We believe that the publication of forecasts is a natural and inevitable extension of corporate disclosure, and that for


forecasts to have credibility, they will need to be independently reviewed."\(^{27}\)

Haskins and Sells takes the stand that it is too early to require or permit forecasts in SEC filings or in published annual reports. When and if the need for and usefulness of forecasts have been established and standards for preparation and presentation have been developed, the company feels that CPAs should be required to report on the forecasts.\(^{28}\)

Arthur Andersen & Company believes that forecasting is not an accounting function. The firm contends that forecasting is an investing function and there should be strict separation between decision making and accounting. Arthur Andersen & Company asserts that accounting should not take on the function of trying to predict the results of uncertain future events. The company does state, however, that published goals and plans may be needed to give investors and financial statement users more meaningful information concerning the past in their attempts to predict and interpret the future.\(^{29}\)

A second opponent to accounting involvement with published forecasts is the firm of Ernst & Ernst. The reasoning of this firm is that public accountants do not have the expertise to assume the responsibility for projections. They, like Arthur Andersen & Company, feel that forecasting is an investment function and that financial analysts have an advantage in that they perform the forecasting function on a "no risk"


\(^{29}\)Williams, op. cit.
Price Waterhouse & Company, while not taking a specific stand, made the comment that accountants cannot separate themselves from the future if accounting is to be a useful profession. Future plans shown on a pro forms basis, but separate from the basic financial statements, should be disclosed; this disclosure would require some way to deal with the shortcomings of the attest function as it relates to projections.  

No matter what the large national CPA firm opinions are, the certified public accountant presently has limitations on his permitted relationship with corporate forecasts. According to Rule 2.04 of the AICPA Code of Professional Ethics, a CPA may not allow the use of his name with a forecast in any way which might lead someone to believe that he is vouching for the achievability or accuracy of the forecast. This rule does not say that he may not prepare or help a client in preparing a forecast. If this assistance is provided, the accountant must fully disclose all information sources, assumptions underlying the forecast, and degree of responsibility being assumed.

As with all issues, one can find accountants who favor publication of forecasts and those who are against it. Both sides are also represented when the possibility of forecast attestation is suggested. It is

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30 Ibid.
difficult to restrict the accountants' viewpoints to matters of publication only, because a major concern of the forecasting issue for accountants is whether they should be involved in forecast attestation. The major reasons against attestation to forecasts by CPAs include the following arguments:

1. CPAs lack competence in evaluating forecasting techniques;
2. CPAs lack ability to evaluate or change management assumptions;
3. Forecast auditing standards have not been developed;
4. Generally accepted forecasting principles have not been defined;
5. Independence of the CPA could be impaired by association with forecasts;
6. Legal liability of the CPA is a deterrent; and
7. Public misunderstanding of forecast audits is likely.\(^\text{34}\)

Previous discussion has established the valid need for independent review and attestation to management forecasts. Arguments against attestation are offered by certain groups of CPAs as well as other interested parties. A major point is that the accounting profession is founded on the concept of public service. If forecasts which are attested to by CPAs benefit the public interest more than forecasts without attestation, then the attest function should be performed.\(^\text{35}\)

ARGUMENTS AGAINST ATTESTATION

The preceding arguments against attestation by CPAs are examined in the following discussion. It is important to distinguish between real

\(^{34}\)James P. Bedingfield and Myron S. Lubell, "Published Forecasts and the CPA," The CPA Journal (January, 1974), cited in Haskins and Sell (New Orleans) This Week in Review (February 8, 1974), p. 4.

\(^{35}\)Ibid.
issues and illusory problems mentioned by CPAs who are reluctant to extend the attest function to forecasts.

**Competence in evaluating forecasts.** CPAs are not econometric experts and this point is an undisputable fact. In forecast audits, the CPA must review the system used to produce forecasts. If a computer-based forecasting model is employed, the accountant will examine the model to determine how efficiently it works. The CPA has regularly applies procedures to evaluate computer programs and internal control systems, but the CPA is not required to be a systems analyst. It seems reasonable to assume that the accountant could validate a forecasting model by using historical data to decide whether the model would have produced adequate projections in comparison to actual results of past periods. If CPA firms can design budgeting systems for clients, then they possess competence to review forecasting systems for auditing purposes.

**Inability to evaluate management assumptions.** A forecast is a management expression of planned future performance by the company. In most cases, it would be inappropriate for the CPA to try to change assumptions used by management in preparing a forecast. If an assumption is unreasonable, not supported by proper evidence, or applied inconsistently, the independent auditor would have a duty to see that an explanation is provided by management. The CPA can substantiate assumptions by reference to internal and external sources. The forecast audit requires a determination that assumptions are reasonable, supported by evidence, and consistently applied. The CPA regularly applies judgment in matters of financial accounting and should be able to review forecasting assumptions on the same basis.

**Lack of forecast auditing standards.** Standards have been developed
for audits of historical financial statements. These standards prescribe auditor qualifications, approach to the audit, a review of the accounting system, and certain reporting requirements. The transition from standards for historical audits to standards for forecast audits should not present a major obstacle. Appropriate auditing standards and procedures must be developed if the CPA is to audit forecasts. The conclusion in one survey of CPAs was that procedures and a format for reviewing budgetary data could be established. This review would of necessity be limited to "compilation of the data and soundness of methods used for projecting future events."36 Chartered Accountants in the United Kingdom have established certain audit guides which would be useful indications of the manner to develop auditing standards in the United States.

**Lack of forecast reporting principles.** Forecast reporting principles should involve form and content of forecasts, updating procedures, and comparative analysis with attained results. In many respects, forecast reporting principles should function in the same manner as generally accepted accounting principles apply to historical financial statements. The present lack of authoritative principles for reporting forecast information can be remedied by research and experience.

**Independence of the CPA.** It is often asserted that involvement with forecasts will impair the third-party independence of the CPA in relation to historical audits. An accountant who attested to the "fairness" of a forecast would, according to this assertion, have a conflict of interest in reviewing year-end adjustments that could determine whether the forecast

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was achieved by actual results. In the 1975 proposed forecast rules, the SEC added a note which indicated that a CPA reviewing or reporting on a projection will still be considered independent with respect to the financial statements of the company which issued the projection.\footnote{37} This same argument of independence was advanced unsuccessfully for many years against management advisory services performed by a CPA firm for an audit client, but this reason has not proved to be a substantial detriment to the traditional audit function.

**Legal liability of the CPA.** This argument against attestation to forecasts is advanced by auditors because of numerous lawsuits in recent years and the increasing cost of professional liability insurance. Some statutory relief of accountants' liability is necessary before attestation becomes required for forecasts. At present, the American Law Institute is engaged in the recodification of the securities law, and one aspect of this study is the placement of reasonable bounds on accountants' legal liability.\footnote{38}

Peat, Marwick, Mitchell and Company states its belief that:

the securities acts should be amended to limit the exposure of CPAs both to historical as well as forecast data, to amounts that are not ruinous, to recognize standards of care that expressly permit the honest exercise of judgment, and to define the legal ground rules for forecasts... We are not suggesting that CPAs should be exonerated from all liability for forecasts, but rather that the degree of liability should be reasonable, and should recognize the difficulties and uncertainties inherent in forecasting.\footnote{39}


\footnote{38}"The Fate of Forecasting," \textit{The Journal of Accountancy} (December, 1974), p. 42.

\footnote{39}Cummings, \textit{op. cit.}, p. 13.
If a company's forecast is prepared conscientiously, in good faith, and reasonably updated, the company will not assume significant liability risks. It seems only reasonable to set the same boundaries on the legal liability of CPAs in relation to forecasts.

Public misunderstanding of auditing. The general public possibly holds a view of auditing as the process of guaranteeing the validity of historical data. If forecasts were to be audited, this misconception might cause the public to infer an achievability or accuracy to the forecast which does not exist. The difficulty here is not with an extension of the audit function to forecasts, but the totally invalid view of what auditing involves. This misconception can only be clarified through education of the public and adequate disclosure by the auditor in relation to both historical data and forecasts. This misconception should not determine boundaries of the audit and attest function.

ARGUMENTS IN FAVOR OF ATTESTATION

The need for attestation to forecasts is clearly established by the features of remoteness, consequence, complexity, and materiality that are inherent in financial forecasts. These arguments are derived from the forecasting environment. Other factors which indicate the likelihood of auditor association with forecasts are the public service attitudes of the public accounting profession and favorable audit experience in the United Kingdom.

The attest function was developed to instill public confidence in financial statements. This function has been extended many times, and additional areas are constantly discussed as possibilities for future

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40Ibid., p. 12.
extensions. The CPA has a recognized obligation to serve the public interest and has always accepted this responsibility in professional practice. Investors are concerned about the future and currently receive financial projections from many potentially unreliable sources. In order to instill more confidence in the quality of forecast information, attestation by CPAs is a reasonable proposition. "[Investors] would expect CPAs to safeguard them against unscrupulous and inept preparers."\textsuperscript{41}

The accountants' role could be to attest to arithmetical accuracy, consistency in applying to future transactions the historically-applied accounting principles, adequacy of disclosure about the probability of forecast attainment, and internal consistency of the data.\textsuperscript{42} The auditor could not determine the validity of management assumptions, because only future events can prove the quality of these judgments. The CPA could evaluate the reasonableness of these assumptions and determine whether there are striking inconsistencies between economic trends and company sales projections or cost figures. In essence, the CPA can review the bases of forecasting for extreme optimism or conservatism. In this manner, the auditor would be serving the public in a role of attestor to the fair presentation of forecast data.

Experiences of Chartered Accountants in the United Kingdom are discussed in detail in the next chapter. The general conclusion is that their experience in reviewing and reporting on certain types of forecasts has been favorable. It is also noted, however, that simple reliance upon


\textsuperscript{42}Ibid.
this experience could not be made in the United States because of distinct differences in the legal and economic environments as well as the differences between reporting on forecasts in takeover bids, prospectuses, and annual financial statements. CPAs in the United States could, however, benefit from this forecast audit experience. The Chartered Accountants have developed procedures and audit reports which could serve as guides toward auditing standards in this country.

**RECENT OPINION SURVEYS ON FORECASTING**

In addition to the large public accounting firms, there are other sources of attitudes about published forecasts. In a survey in the mid-1960s, controllers and public accountants were questioned as to the extension of the attest function by CPAs. In the area of extension to budgets and other statements of business planning, 94 per cent of the controllers indicated that there was no need for this extension as compared to 59 per cent of the public accountants. Reasons for not extending the attest function generally included lack of objective measurement criteria and lack of justifiable reason for attesting to forecast information.43

In 1970, the National Association of Accountants conducted a survey of corporate executives and security analysts. This survey showed that 72 per cent of the companies surveyed were, at that time, publicly or privately disclosing profit expectations to individual security analysts. Approximately 50 per cent of the executives approved of publicly releasing expected earnings per share and related assumptions. On the other hand, 97 per cent of the surveyed security analysts agreed that projected profit

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plans would be useful in evaluating securities; but 70 per cent of this group was opposed to including such plans in corporate annual reports because of the necessity to justify differences between analysts' projections and the company profit plan, the tendency to become overly dependent on published plans and to neglect independent verification, and the possibility that companies would publish misleading data. The analysts did favor publishing a range of earnings expectations rather than a formal profit plan provided that the range information was accompanied by fundamental assumptions.44

An independent survey in 1971 was conducted with three types of respondents which included corporate financial officers, financial analysts, and CPAs. Financial officers were strongly opposed to publication of projected data because they felt that it would be detrimental to their competitive position and that investors might not use the information properly. The financial analysts' responses were varied. They would use the additional data but its availability would not change their methods of evaluating investment decisions. Disclosure of forecast information would be useful to them, but they believed that it might confuse the average investor. CPAs in general felt that procedures could be developed for reporting forecasted information, but they thought investors would tend to regard the figures as precise. Accountants feared the improper use of the information by investors and also cited possible injurious effects on competitive advantage to the issuing company.45


45Skousen, Sharp, and Tolman, op. cit., pp. 51-56.
In 1972, a major survey dealing with forecasts was conducted by the Financial Executives Research Foundation. Over 97 per cent of the responding companies prepared corporate earnings, expense, and sales forecasts covering between one and twenty-three months. Of these companies, 92 per cent expressed forecasts in specific amounts rather than as a range of values. Underlying assumptions were considered a necessary part of a forecast, and between 70 per cent and 85 per cent of the companies had documentation in excess of two pages on which to base their assumptions. Variances between forecasted and actual results are generally within a plus or minus 10 per cent range, except that earnings by divisions experienced approximately a 20 per cent variance in 13 per cent of the respondent companies. Finally, 92 per cent of the responding companies were opposed to public release of forecasts for all reasons mentioned in previous surveys as well as the cost factor for revisions.\(^4\)

The American Institute of CPAs conducted a survey of chartered financial analysts (CFAs), financial executives (FEs), and certified public accountants (CPAs). The proposal to encourage firms to regularly publish a forecasted income statement was agreed to by 59 per cent of the CFAs and 49 per cent of the CPAs, but disagreed to by 61 per cent of the FEs. In the area of competition, 68 per cent of the CFAs, 40 per cent of the FEs, and 63 per cent of the CPAs agreed that there would be no harm to the competitive position of a firm which publishes a forecast. The CFAs, FEs, and CPAs were in general agreement that investors might misinterpret forecasted income statements (47 per cent, 57 per cent, and 48 per cent, respectively). The majority of respondents (67 per cent, 55 per cent, and

\(^4\)Kearney, Sidley, and Austin, *op. cit.*, pp. 9-55.
49 per cent) agreed that fear of losing public confidence would deter corporations from publishing overstated earnings forecasts. In terms of attitudes toward CPAs' reporting on forecasts, 40 per cent of the CFAs, 33 per cent of the CPAs, and 21 per cent of the FEs had a favorable attitude toward such reports. 47

The trend seems to point to an increasing agreement that forecasted information is a necessary addition to the investor decision model. Financial executives are still in strong opposition to forecast disclosure, although their position is weakening. Companies have budget or forecast data, use it internally, and, in many cases, already provide external disclosure on a selective basis. Public dissemination of the forecasts would give all investors an equal basis upon which to make decisions.

CHAPTER SUMMARY

Inclusion of financial forecasts in published financial statements must be discussed in relation to the users, preparers, and auditors of those statements. The Study Group on Objectives of Financial Statements remarked that forecasts should be included if they would augment the reliability of the financial statements. Forecasts basically conform to most of the qualities used to judge accounting information for inclusion in financial statements.

Users and corporate managements have expressed both positive and negative arguments about published forecasts. Published projections will help eliminate the unequal distribution of budgetary data which now occurs. Improved forecast disclosure standards should develop because of recent involvement by the Securities and Exchange Commission. The trend of recent

court cases appears to favor publication of projections and estimates. Because of the clarification on areas of potential legal liability, many of the arguments against forecast publication cannot be regarded as substantial.

The public accounting profession is basically concerned about potential legal liability from attestation to forecasts. In spite of all the arguments against extending the attest function, it will probably be investors and authoritative agencies such as the SEC which determine the role of CPAs in this matter. For users of financial statements, there are service benefits provided by both forecasts and attestation.

Investors are interested in truthful, realistic, and informed indications of corporate plans and management expectations, since investment decisions are based on the future. Published forecasts can help reduce the uncertainty inherent in these decisions. Chapter III discusses the current state of affairs in the forecasting area such as the SEC position and United Kingdom experience. The forecasting disclosure problem is examined by reviewing the experience of Fuqua Industries, Inc., in its public distribution of forecasts.

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CHAPTER III

DEVELOPMENTS IN FORECAST DISCLOSURE

Published forecasts have been mentioned in accounting literature in the past, but only since 1970 has there been serious interest in the subject. Reasons for this sudden interest include experimentation by certain companies in forecast disclosure and investors who are better informed and desire more information. Another explanation of this interest is that demand for forecast information is a natural phase of accounting evolution. Resolution of issues in financial accounting has consistently required increased disclosure of information by corporations.

The purpose of this chapter is to discuss current issues and developments in forecast disclosure, including the role of security analysts, recommendations of the Securities and Exchange Commission, and forecasting practice in the United Kingdom. The experience of Fuqua Industries, Inc., with voluntary forecast disclosure in 1973 and 1974 is also analyzed as a basis for developing recommended forecast reporting principles.

Since forecast publication is not a common practice in the United States, the basic sources of forecast information have been reports of security analysts and corporate executive commentary. In February, 1973, the SEC issued a regulation to permit voluntary inclusion of forecasts in reports filed with the Commission. In contrast to these developments, Chartered Accountants in the United Kingdom are involved with corporate
forecasts and must evaluate the reasonableness of management projections and underlying assumptions.

FORECASTS BY SECURITY ANALYSTS

Security analysts have consistently been a major source of information concerning future corporate earnings. Analysts have been able to obtain the necessary information and have the clients to make their forecasting efforts worthwhile. However, there never have been any uniform guidelines for preparation of earnings projections by security analysts. Each analyst is free to modify or ignore management assumptions, to use the information considered relevant, and to disclose the resulting forecasts on a selective basis.

With the development of forecasts in this manner, there is always the likelihood that forecasts prepared for the same company by different analysts will vary considerably. There are no reporting principles with which analysts must comply, and there is no requirement to disclose underlying assumptions. Therefore, investors and other users have no way to judge the quality or level of optimism inherent in forecasts prepared by analysts.

In addition to the possibility of different forecasts, there is a lack of equal access to this information. Everyone who desires historical data concerning a publicly owned company can obtain it, but there is no corresponding accessibility to projection data or knowledge by users that such information exists. The SEC has attempted to correct this inequitable situation. The Commission issued the following statement in 1973: "It is the appropriate time to take the lead in developing standards and guidelines that will enable all issuers to understand their responsibilities
and all investors to have equal access to projection information.\(^1\)

Forecasts prepared by many security analysts are available to the public in published form and are often printed in financial news letters or other media. It has been suggested that satisfactory results could be obtained without forcing corporate issuance of forecasts by simply requiring analysts to disclose forecasting assumptions. This proposal is unsatisfactory because it assumes that potential users of forecast information will have knowledge of its availability.

As pointed out by Mr. Harvey Kapnick of Arthur Andersen & Company, investment advisors occupy a significant role in forecasting because they may have information concerning competitors and other factors which are unknown to management.\(^2\) The opposite contention is that management should be in a better position to forecast sales and earnings of a particular company or otherwise analysts would be retained to prepare budgets for management use. Disclosure of forecast information by management should not be confused with the role of providing investment advice. Forecasting advocates simply wish corporate management to assume the responsibility of preparing and issuing projections so that information of uniform quality is equally available to all potential users.

A Conference Board study of management executives in 1973 examined corporate relationships with security analysts regarding the flow of forecast information. Executives in this survey agreed that most security


analysts tend to ask broad and penetrating questions in the following basic areas.

Financial Data: Earnings and earnings per share, sales, capital expenditures, product line details, financing, depreciation, costs, dividends, taxes.

Market Conditions: Share of market, industry trends, economic conditions, competition, overseas prospects.

Operating Data: Prices, inventory, orders, production, labor, foreign operations, anticipated problems.

Growth Plans: Acquisitions, diversification, new products, new ventures, new plants, general outlook.

Management: Changes, background, philosophy.\(^3\)

The study found that "in half of the companies, only information that has been published or is otherwise available to stockholders can be obtained by analysts."\(^4\) The basis of forecasts prepared by analysts in many cases is entirely dependent on management projections. The survey also indicated that management often comments on forecasts developed by analysts in order to "guide analysts in the right direction."\(^5\)

There are several reasons which explain the reluctance of corporate management to issue forecasts publicly. The history of financial accounting has documented the former unwillingness of management to disclose profits, much less internal planning information. There is also the potential threat of legal liability to investors who might claim damages from having relied upon management forecasts which involved misleading facts.


\(^4\)Ibid.

\(^5\)Ibid., p. 21.
While threat of this liability has diminished with legal clarification that forecasts are not facts, corporate management simply has not accepted the responsibility of disclosing forecast information. If management would accept this responsibility, it could simplify the role of security analysts whose actual function is to evaluate the merits of particular securities. Given adequate forecast disclosure, analysts could adjust this information if revisions were considered necessary.

SEC REGULATIONS CONCERNING FORECASTS

Financial forecasts prepared by security analysts or managements are generally unpublished. The basic attitude of the SEC about projections until 1973 is indicated in a quote from "Disclosure Requirements Under Federal Securities Regulations" written in 1961:

"Since an expert can speak with authority only as to subjects upon which he has professional knowledge and since no engineering course or other professional knowledge has ever been known to qualify anyone as a clairvoyant, attempts by companies to predict future earnings on their own or on the authority of experts have almost invariably been held by the Commission to be misleading because they suggest a competence which in fact does not exist."6

The SEC justified its negative attitude towards forecasts with the following reasons:

1. The belief that forecasts could lead to wider management manipulation;
2. The contention that forecasts cannot be substantiated;
3. No guidelines exist that the issuer, financial analyst, or investor can rely on;
4. The conviction that the historical cost model is an expression of objectivity;

5. Potential dangers for the novice as a result of changing factors and assumptions which nullify forecasts;

6. The possibility that the degree of subjectivity would mislead the investor;

7. The lack of experts to examine the forecasts would place an added burden on the investor to interpret them for himself;

8. The attitude of "conservatism" expressed by public accountants in order that the scope of their responsibilities be limited;

9. The lack of confidence in the investor's ability to accurately evaluate forecasts; and

10. The SEC's belief that the primary purpose of disclosure regulations is to prevent manipulative trading practices from being perpetrated against people interested in market reality.7

A shift in attitude about projections began appearing in 1969 when the SEC required pro forma statements to be included in the financial statements of all merger proxies.8 For certain real estate companies, initial offering prospectuses were allowed to contain pro forma figures, and companies in extractive industries were required to present "engineering estimates of the physical quantities to be realized from relevant properties, mines, or deposits in the future."9 At this time, Chairman Casey began stressing the necessity for all investors to read prospectuses. He believed that earnings projections should be included in such documents since many investors were getting equivalent information from investment advisors.10 Public SEC hearings were held from November


8Proxy Regulation, Securities Exchange Act of 1934, Item 149b, Schedule 14A.

9SEC Form S-1, Registration Statement Under the Securities Act of 1933.

20, 1972 to December 12, 1972, on the topic of corporate publication of earnings forecasts. Arguments for and against such publications were presented, and an announcement was made on February 2, 1973, that the SEC would allow voluntary publication of earnings projections by some companies in SEC-filed documents.

PROJECTION DISCLOSURE POLICIES

Three categories of companies were originally established by the Commission for purposes of implementing its projection policy: (1) reporting companies; (2) issuing companies; and (3) other. Reporting companies will be allowed to publish forecasts in SEC filings. Issuing companies do not meet reporting company standards but may publish forecasts outside of SEC-filed documents. Other companies may meet the standards of either category (1) or (2), but they do not choose to release income projections.\footnote{11"The SEC Policy for Projections: New Problems in Disclosure," \textit{UCLA Law Review}, Volume 21 (1973), p. 247.} Standards and requirements for reporting companies are as follows:

First, the company must have been an Exchange Act company for a reasonable period of time and it must have a history of earnings and internal budgeting.

Second, minimum standards are set for the forecast. The forecast would have to be for a reasonable time period, such as a fiscal year. At a minimum, projected sales and earnings must be stated as an exact dollar amount or expressed in a reasonable range. Underlying assumptions of the projection must be disclosed. Finally, a decision in the future to omit forecasts must be accompanied by a statement of reasons for cessation.

Reporting companies would be required to update projections on a regular basis, as well as in the event of material changes in projections.
The forecast must be included in the annual Form 10-K with a comparison being made with actual figures. Cause of material variations must be given.\textsuperscript{12}

If a company does not meet the standards prescribed for a reporting company or does not wish to comply with filing and disclosure requirements of reporting companies, the firm can elect to be an issuing company. An issuing company may publish forecasts outside of SEC-filed documents. An issuing company must, however, treat the release of forecast information as a material event which requires full and immediate disclosure. The forecast must also be filed on a special form with the SEC. Many requirements applicable to reporting companies also apply to issuing companies. For example, material variances between projections and actual results must be explained in Form 10-K.

The essence of SEC forecast regulations is that a firm which qualifies as a reporting company must comply with the applicable filing and disclosure requirements if it elects reporting company status. There are substantial differences in these requirements depending upon reporting company or issuing company status. Issuing companies are not subject to standards concerning the formal projection, such as reasonable time period, and minimum disclosure of sales and earnings. Issuing companies also are exempt from the standards regarding history of earnings and internal budgeting. According to the original SEC release, issuing companies are not required to disclose forecast assumptions or to release updates on the initial projection. However, in a speech by former SEC Chairman Cook in March, 1973, there was an indication that requirements concerning assumptions and updates would be extended to all companies

\textsuperscript{12}Ibid., p. 248.
that present forecasts in SEC-filed documents or to the financial media. \(^{13}\)

An important item contained in the SEC disclosure policy deals with management commentary on projections prepared by or issued from other sources. "In order to reduce the potential of indirect or clandestine disclosure, any confirmation by company management of the projections of outsiders will cause the projection to be imputed to management and will bind the company to fulfill the reporting requirements which are placed on issuing companies."\(^{14}\) If a company acknowledges or confirms a forecast which later becomes materially inaccurate, this policy will hold company management responsible for issuing appropriate correcting statements. This section of the disclosure regulations should reduce any casual assent by management to forecasts prepared by security analysts.

**CORPORATE LIABILITY FOR PROJECTIONS**

This issuance of misleading projections could result in possible legal liability to a company under either common law or securities law. Potential liability under the securities law is provided in the Securities Act of 1933 and Securities Exchange Act of 1934. Under common law doctrines, a fraudulent misrepresentation of opinion exists if the person professing the opinion knows or believes it to be untrue or if he has no basis for believing his opinion to be valid. This type of fraudulent misrepresentation of opinion is actionable, but no liability exists for someone who expresses an honest opinion.\(^{15}\)

\(^{13}\)Ibid., p. 249, Footnote 23.

\(^{14}\)Ibid., p. 249.

In 1966, the draft of the Restatement of Torts discussed negligent misrepresentation. The draft took the following position: "A misrepresentation occurs when one who supplies information for the guidance of others fails to exercise the care and competence that the recipient is justified in expecting, and one of the class of persons for whose guidance the information is supplied suffers harm." This concept could hold substantial liability for companies issuing projections, depending on the required level of competence established by law. For the present, however, the standard is that no common law liability exists for opinions which turn out to be false.

In the Securities Act of 1933, Section 11 deals with legal liability of corporations in connection with the market for new security issues. The major concern of this section with security registrations involves false statements of material facts or omission of material facts necessary to make financial statements not misleading. If a purchaser of securities can demonstrate that the prospectus contained a "materially misleading statement," then the company issuing the securities faces almost certain liability. The important point is that the statement or fact in question must be proved to be materially misleading.

The courts presently have no guidelines to determine what is materially misleading with regard to forecasts. Judgments in non-forecasting litigation are often made in a quantitative manner with different criteria depending upon the type of information involved. In the BarChris case, a 15 per cent overstatement of net income was not considered material,

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16 Ibid.
but a working capital ratio of 1.9 as compared with 1.6 actual was judged to be a material misstatement.17

Complete reliance upon quantitative criteria in judicial proceedings could be detrimental to the issuance of forecasts by management. In order to determine the nature of misleading statements in a forecast, circumstances surrounding issuance of the projection and use of this information by investors need to be evaluated. With regard to liability under Section 11 of the 1933 Act, current thoughts on forecast accuracy and materiality are summarized by the following quotation.

"... Section 11 requires the statement to be misleading at the time the registration statement was effective before there is recovery. Therefore, unless the underlying assumptions are misrepresented, proof that the projections themselves were misleading at the effective date would appear quite difficult. The concern of the courts so far has been that the estimate which management itself is using should be included, rather than how accurate the estimate is. The range for accuracies so far has been very broad, and the courts have accepted qualification of the estimate."18

Section 12 of the Securities Act of 1933 deals with the liability of persons selling securities in interstate commerce by using a prospectus or communication containing a misleading statement. This section requires that the seller of such securities did not know or could not have known by exercising reasonable diligence that a misstatement existed.19 This point suggests that the seller in such markets must make reasonable independent investigation of any projections made by management in the prospectus or other type of communication. Under this section,


18 "The SEC Policy for Projections...," op. cit., p. 263.

19 Ibid., p. 264.
underwriters and brokers could be subject to liability if they make no investigation concerning the reasonableness of forecasts prepared by company management. This potential liability is one factor which should create demand for review of forecasts by independent CPAs.

The Securities Exchange Act of 1934 prescribes regulations for annual financial reporting to the SEC by companies subject to its jurisdiction. Rule 10b-5 under this act involves legal liability in relation to projections. With regard to misstating or omitting material facts, a projection under Rule 10b-5 would have to be proved "material", and the investor must prove that the projection was relied upon. In SEC versus Texas Gulf Sulphur Company, the materiality test was applied in terms of importance of certain information to a "reasonable man" and whether such information might affect the value of a company's securities.\(^{20}\) It appears reasonable that forecasts of future operations would meet these materiality tests.

Assuming that a forecast of annual profits would be considered material information, reliance upon this information must be proved before a company could be held liable for misstating or omitting important facts. If an investor bought or sold securities soon after the issuance of a forecast, any assertion of reliance would appear believable or could be inferred by the court. Less reliance could be inferred as the time period separating forecast issuance and a specific security transaction increases. This point indicates the need of company management to revise or update forecasts that will not be achieved.

"Thus, it would be in be company's best interest to publicly

update the projections as soon as possible in order to reduce the possibility of reliance on earlier projections. In addition, reliance would be difficult to infer once a company had issued an earnings report, even if this were an interim statement. A reasonable investor would not have relied on past projections when the company had come out with statements which indicated that the projection was not going to be met."

DISTINCTION BETWEEN FACT AND OPINION

Liability under the Securities Acts arises from misstatement of material facts or failure to disclose material facts. In relation to forecasts, there is a definite need to establish a distinction between fact and opinion. The trend in court cases seems to be in the direction of regarding forecasts as opinions as long as the projections are supported by objective evidence. In Dolgow versus Anderson, the U. S. District Court in New York held that

"projections, when scrupulously prepared by individuals in the best position to make them and when properly reviewed and honestly believed to be reasonable at the time they were made, are not untrue statements of material facts if future uncontrollable events prove the forecast wrong, as long as a revision is fully publicized on a timely basis."²²

In Beecher versus Able, the court ruled that an earnings forecast is not actionable simply because the projections were not achieved. The court stated that income projections should be based on fact and that forecast assumptions must be disclosed "if their validity is sufficiently in doubt that a reasonably prudent investor, if he knew of the underlying assumptions, might be deterred from crediting the forecast."²³


In relation to liability for forecasts, the SEC is considering a rule that specifies circumstances in which a forecast that is not achieved will not be deemed a misleading statement of a material fact. This rule is the "safe harbor" provision of the proposed forecasting regulations. The intent of the safe harbor provision is to define those circumstances which will afford the greatest likelihood of producing a reasonable projection. A company which qualifies under this rule would be protected against claims by investors that the company's unachieved forecast is a misleading statement of a material fact.

To qualify under the safe harbor provision, a company must have been reporting to the SEC under the Securities Exchange Act of 1934 for at least three years and must have filed all required reports during the preceding twelve months. The company must have prepared internal budgets for at least three years, but it is no longer proposed that the issuer must have a history of earnings.\(^d\) The forecast to be issued must be reasonably prepared, reviewed, and in compliance with the minimum standards prescribed for projections by a reporting company. If the forecast is to include interval estimates, a range of ten per cent will be considered reasonable unless the company can prove a more valid range. The forecast may be reviewed by an independent third party, and a statement or opinion concerning this forecast review will be allowed.\(^d\)

Potential legal liability for companies has clearly deterred the


\(^{25}\)Ibid., pp. 13-14.
public issuance of forecasts. The proposed SEC regulations and distinction between fact and opinion in certain court cases should reduce the legal risks associated with forecasts. A favorable legal environment is a necessary condition for management to accept any responsibility for issuing forecast information.

CASE OF FUQUA INDUSTRIES, INC.

Fuqua Industries is a publicly owned corporation with annual sales in excess of $500 million. The company is diversified and its principal products include agricultural machinery, real estate development, lawn and garden equipment, sporting goods, photographic finishing, and motion picture entertainment. Total assets on December 31, 1974, were $441 million. Fuqua received considerable publicity in 1973 when it initiated a program to disclose forecasted sales, net income, earnings per share, and supporting commentary by management. Forecasts were issued for 1973 and 1974. Each forecast is analyzed in the following sections with regard to form, content, interim revisions, and comparison with actual results.

ANALYSIS OF 1973 FORECAST

The forecast for 1973 was issued in December, 1972, in a Preliminary Annual Report which disclosed the actual income statement for 1971, unaudited results for 1972, and the 1973 projection. The 20 page report included financial highlights, ratio analysis, and other performance measures for the period 1967-1973 along with management discussion of prospects for each major area of company operations. Forecasted sales and net income were also presented for each principal product line or class of business activity. A letter to stockholders within the report
described the forecast as follows:

We urge you to understand that forecasts of future operations are based on business factors as evaluated by management at the time such forecasts are made. In order not to mislead investors, we believe our 1973 forecasts to be conservative, representing our minimum anticipated financial performance as we see economic and competitive factors in December, 1972. It is important to read the commentary relating to 1972 operations and 1973 forecasts to fully evaluate this report.\(^{26}\)

The 1973 forecast included sales of $484 million, net income of $21.4 million, and earnings per share of $2.09. Fuqua issued its 1972 annual report in February, 1973, and this document further described budgetary procedures used in developing the forecast and presented the projections for 1973 in all comparative financial analyses outside the formal financial statements for 1972.\(^{27}\) The independent auditors, Ernst & Ernst, did not comment upon the forecasts and were not mentioned in the initial forecast document which preceded publication of the 1972 annual report.

During 1973, there was no public disclosure of any forecast revisions implemented by Fuqua. In February, 1974, the company published a report entitled Preliminary Results for 1973 which compared a restated 1973 forecast with unaudited 1973 results and also presented the forecast for 1974. The 1973 annual report to stockholders was also issued in February, 1974. In this report, audited annual results for 1973 were compared with the original forecast as restated for the effects of discontinued businesses. Several corporations within the consolidated entity were acquired


during 1973, and certain operations were discontinued.

The summary of operations in the 1973 annual report presented the following comparative information along with details for each line of business.\(^2^8\)

<table>
<thead>
<tr>
<th>(Dollar Amounts in Millions)</th>
<th>Original</th>
<th>Restated</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total sales</td>
<td>$484.0</td>
<td>$429.0</td>
<td>$479.2</td>
</tr>
<tr>
<td>Income - continuing operations</td>
<td>$21.4</td>
<td>$18.1</td>
<td>$20.3</td>
</tr>
</tbody>
</table>

Actual net income for 1973 was $16.5 million which reflected the operating results of discontinued businesses and any gains or losses on disposal of these segments. Actual net income and related earnings per share analysis were presented only in the formal income statement.

Changes in corporate structure. One problem in evaluating the quality or accuracy of the 1973 forecast is that relevant information was contained in three documents: a preliminary annual report for 1972 which presented the original forecast; a preliminary annual report for 1973; and the formal annual report for 1973. Restatement of the original forecast is analyzed in this section to determine the procedures which should be used in revising a forecast to reflect changes in corporate structure.

Exhibit 3.1 shows the original 1973 forecast as it was presented in December, 1972, and the revised forecast which appeared in the preliminary report for 1973. The original forecast was restated for the effects of discontinued businesses, and all adjustments required to reconcile the two forecasts are disclosed in Column (b) of Exhibit 3.1. When the

## EXHIBIT 3.1

**FUQUA INDUSTRIES, INC.**

COMPUTATION OF 1973 FORECAST REVISION

(Amounts in Thousands of Dollars)

<table>
<thead>
<tr>
<th></th>
<th>(a) Original Forecast for 1973</th>
<th>(b) Total Adjustments</th>
<th>(c) Revised Forecast for 1973</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net sales</td>
<td>$484,000 ($55,000)</td>
<td>$429,000</td>
<td></td>
</tr>
<tr>
<td>Total expenses</td>
<td>(441,600) 48,500</td>
<td>(393,100)</td>
<td></td>
</tr>
<tr>
<td>Income before taxes</td>
<td>$ 42,400 ($ 6,500)</td>
<td>$ 35,900</td>
<td></td>
</tr>
<tr>
<td>Income taxes</td>
<td>(21,000) 3,200</td>
<td>(17,800)</td>
<td></td>
</tr>
<tr>
<td>Income from continuing operations</td>
<td>$ 21,400 ($ 3,300)</td>
<td>$ 18,100</td>
<td></td>
</tr>
</tbody>
</table>

(a) Source of original forecast is *Preliminary Annual Report 1972*, page 3. Forecasted earnings per share based on 10,000,000 common shares was $2.09.

(b) Reductions in the original forecast were computed as the difference between original and revised projections.

(c) Source of revised forecast is *Preliminary Results for 1973*, page 2. The revised forecast disclosed only sales, income before taxes, income taxes, and income from continuing operations.
original forecast was issued, it emphasized projected net income of $21.4 million and related earnings per share of $2.09. The restated forecast developed by Fuqua did not extend beyond "income from continuing operations." Evaluation of the forecast and actual results in terms of income from continuing operations is acceptable as long as the two income measures are properly comparable.

A major question regarding comparability involves the nature of forecast adjustments summarized in Exhibit 3.1. Since the adjustments were described as restatements of the initial forecast to reflect discontinued operations, the forecast revisions should correspond approximately with revenues and expenses of the discontinued segments. In Exhibit 3.2, total adjustments to the original forecast are compared with the effects of discontinued operations as reported in the 1973 annual report. In the revised forecast, sales were adjusted downward by $55 million, but actual sales of discontinued segments in 1973 were $25.5 million. With regard to income from continuing operations, the forecast was adjusted downward by $3.3 million, but the actual operating losses of discontinued segments amounted to $3 million. Unexplained adjustments to the original forecast, as derived in Exhibit 3.2, involve a $29.5 million decrease in sales and a $6.3 million decrease in income from continuing operations.

Analysis in Exhibit 3.2 assumes that actual and forecasted operating results for discontinued segments should be approximately equal. Two subsidiaries were sold in 1973, and three other firms were sold early in 1974. No explanations were provided by Fuqua to reconcile the forecast revisions with actual results of discontinued operations. One inconsistency of any downward adjustment to the original forecast is that four
**EXHIBIT 3.2**

**FUQUA INDUSTRIES, INC.**

**ANALYSIS OF 1973 FORECAST REVISION**

(Amounts in Thousands of Dollars)

<table>
<thead>
<tr>
<th></th>
<th>(a) Adjustments to 1973 Forecast</th>
<th>(b) Results of Discontinued Operations</th>
<th>(c) Unexplained Revision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net sales</td>
<td>$55,000</td>
<td>$25,500</td>
<td>$29,500</td>
</tr>
<tr>
<td>Total expenses</td>
<td>(48,500)</td>
<td>(31,000)</td>
<td>(17,500)</td>
</tr>
<tr>
<td>Income before taxes</td>
<td>$6,500</td>
<td>($5,500)</td>
<td>$12,000</td>
</tr>
<tr>
<td>Income taxes</td>
<td>(3,200)</td>
<td>2,500</td>
<td>(5,700)</td>
</tr>
<tr>
<td>Income from continuing operations</td>
<td>$3,300</td>
<td>($3,000)</td>
<td>$6,300</td>
</tr>
</tbody>
</table>

(a) Total adjustments to the original 1973 forecast are computed in Exhibit 3.1. Direction of the forecast revision was to reduce sales by $55 million and income by $3.3 million.

(b) Actual results of discontinued operations were reported by the company in its *1973 Annual Report*, page 27. Discontinued segments had revenues of $25.5 million and operating losses of $3 million.

(c) The original forecast was restated for discontinued operations. If amounts in Column (b) were eliminated from the original forecast, then amounts in Column (c) were the additional adjustments required to account for the total forecast revision shown in Column (a). Amounts in Column (c) represent a $29.5 million decrease in forecasted sales and a $6.3 million reduction in forecasted income.
new companies were purchased during 1973. A realistic revision of the forecast for continuing operations would be to increase the initial sales and net income forecasts to include amounts applicable to companies acquired during the year. Since adjustments of this nature were never mentioned, it is not possible to determine whether the restated forecast is properly comparable with actual income reported for 1973.

In summary, forecasted income was restated from $21.4 million to $18.1 million. The revised forecast presents a pleasing comparison in relation to income from continuing operations of $20.3 million as actually reported for 1973. It is not possible, however, to objectively analyze or evaluate the $3.3 million forecast revision to determine the exact nature or propriety of this amount.

Comparison of earnings per share. The Preliminary Results for 1973 compared forecasted and actual earnings per share with the following statement: "Earnings forecast for 1973 were $2.09 per share. Estimated actual 1973 earnings from continuing operations is $2.10 per share." This statement was printed in bold dark print and was the only forecast to actual earnings per share comparison contained in any document involving the 1973 projection. This comparison fails to note that the $2.09 forecast amount pertained to the original forecast, whereas sales and earnings on a forecasted basis were restated for discontinued operations in all other evaluations of the 1973 forecast.

If the earnings per share comparison had been based on the revised forecast, there would have been less sensation than was caused by the

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apparent one cent accuracy which Fuqua reported. Primary earnings per share of $1.76 based on income from continuing operations in the revised forecast is computed in Exhibit 3.3. If the $1.76 amount had been reported in relation to $2.10 actual, users of this information could have properly assessed the level of conservatism inherent in the forecast. The highly publicized comparison of $2.09 versus $2.10 is an illusion of forecasting accuracy caused by improper disclosure.

The analysis and criticism of practices by Fuqua Industries in forecast disclosure are not designed to discredit the company. Results of this analysis emphasize the importance of independent forecast review by a third party and the need for standards or principles of disclosing and evaluating forecast information. Reporting principles are clearly needed to guide management in disclosing original forecasts, interim revisions, and comparisons between actual and forecasted results. The 1973 forecast and subsequent evaluations by Fuqua Industries involved both confusing and misleading practices which could be avoided in the future if appropriate reporting principles were observed.

ANALYSIS OF 1974 FORECAST

The initial forecast for 1974 was issued by Fuqua Industries in its Preliminary Results for 1973. Projected sales were $541 million with income from continuing operations of $24 million.\(^{30}\) The four-page forecast disclosure was considerably less extensive than the 1973 presentation. In the company's interim report for the six months ending June 30, 1974, Fuqua issued a revised forecast calling for total sales of $581 million and

\(^{30}\text{ibid.}, p. 2.\)
EXHIBIT 3.3
FUQUA INDUSTRIES, INC.
ANALYSIS OF 1973 EARNINGS PER SHARE

<table>
<thead>
<tr>
<th>Primary Earnings Per Share</th>
<th>(a) Original Forecast for 1973</th>
<th>(b) Revised Forecast for 1973</th>
<th>(c) Actual Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>From continuing operations</td>
<td>$2.09</td>
<td>$1.76</td>
<td>$2.10</td>
</tr>
<tr>
<td>Discontinued operations</td>
<td>---</td>
<td>(.38)</td>
<td>(.40)</td>
</tr>
<tr>
<td>Total</td>
<td>$2.09</td>
<td>$1.38</td>
<td>$1.70</td>
</tr>
</tbody>
</table>

(a) Source of data in original forecast is Preliminary Annual Report 1972, page 3. Adjustments used in computing the $2.09 amount are computed below for use in (b).

- Forecasted income $21,400,000
- 10,000,000 shares x $2.09 (20,900,000)
- Income adjustments for EPS $ 500,000

(b) Source of income data in revised forecast is Preliminary Results For 1973, page 2. Earnings per share is computed as follows:

- Revised forecast of income $18,100,000
- Less adjustments for EPS in (a) (500,000)
- Earnings per share numerator $17,600,000
- Earnings per share based on 10,000,000 shares $1.76

The $.38 effect of discontinued operations is the per share amount of $3,800,000 loss on disposal of segments.

(c) Source of actual earnings per share data is 1973 Annual Report, page 33.
income from continuing operations of $21.5 million. Reasons for the forecast revision included higher than anticipated interest costs and general inflationary trends. It was also noted that adverse effects on business performance could be expected if the recession continued throughout 1974.

After Fuqua revised its original forecast in the third quarter, annual operations for 1974 were affected by a change in consolidation policy and adoption of the LIFO method of inventory valuation. The change to LIFO was implemented toward the end of 1974 and decreased net income by $4 million. Arizona Valley Development Company was included in the original forecast but was excluded from actual results for 1974 because of a change in consolidation policy. Because of these reasons and other problems in explaining actual to forecast variations, the 1974 annual report contained no comparative analysis between actual and forecasted results.

Exhibit 3.4 presents the original 1974 forecast, the revised forecast, and actual results for income from continuing operations. The annual report compared 1974 operations to actual results for 1973 and excluded both the original forecast and revised forecast from all performance analysis. Management commentary throughout the annual report could have been used to explain the company's inability to achieve forecasted results for 1974. Principal operating problems included fuel shortages, difficult credit conditions in consumer financing, prolonged strikes, material shortages


32 Ibid., p. 2.

## EXHIBIT 3.4

**FUQUA INDUSTRIES, INC.**

**SUMMARY OF 1974 FORECASTS AND ACTUAL RESULTS**

(Amounts in Thousands of Dollars)

<table>
<thead>
<tr>
<th></th>
<th>(a) Original Forecast</th>
<th>(b) Revised Forecast</th>
<th>(c) Actual Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net sales</td>
<td>$541,000</td>
<td>$581,000</td>
<td>$550,700</td>
</tr>
<tr>
<td>Total expenses</td>
<td>(493,700)</td>
<td>(538,400)</td>
<td>(531,300)</td>
</tr>
<tr>
<td>Income before taxes</td>
<td>$47,300</td>
<td>$42,600</td>
<td>$19,400</td>
</tr>
<tr>
<td>Income taxes</td>
<td>(23,300)</td>
<td>(21,100)</td>
<td>(9,200)</td>
</tr>
<tr>
<td>Income from continuing operations</td>
<td>$24,000</td>
<td>$21,500</td>
<td>$10,200</td>
</tr>
</tbody>
</table>

Sources of data are the following reports issued by Fuqua Industries, Inc.:

(a) *Preliminary Results for 1973*, page 2.

(b) *Six Months Report and 1974 Forecast Update*, page 2.

(c) *1974 Annual Report*, page 23.
and higher prices, and economic slowdown in several industries.

As indicated in Exhibit 3.4, the variation between actual income and the revised forecast was $11.3 million or 111 per cent of actual income. The company did not cite specific reasons for having failed to analyze the difference between forecasted and actual results. There were several uncontrollable economic factors which could have been used in such a reconciliation, as well as controllable factors such as the effects of change in accounting principles. The company chose to ignore this reporting responsibility and also discontinued its policy of issuing forecasts. There was never any detailed public statement regarding the reasons for this decision.

In general, the forecasting experience of Fuqua Industries, Inc., was not a success from the standpoint of a company being able to issue and reasonably achieve a forecast. The overall experience should prove to be valuable for companies which elect to issue forecasts in the future. Appropriate reporting principles must be developed concerning form and content of forecasts, updating procedures, and comparisons between forecasts and attained results. In many cases, management will be reluctant to analyze objectively a forecast which was not achieved by actual operations. Since the illusion of accuracy is easily created by using inappropriate comparisons, forecasts and related evaluations issued by management should be reviewed and reported upon by an independent third party.

FORECASTS IN THE UNITED KINGDOM

In comparison with the limited experience and controversial nature of published forecasts in this country, accounting practice in the United Kingdom with respect to projections is considerably different. Formal forecasts are not issued in corporate annual reports to stockholders or
in subsequent statements prepared by the company, but general comments are permitted regarding the overall trend of operations and expected future profits. In contrast, forecasts have for many years been included in prospectuses and takeover circulars. "Forecasts must be published in a prospectus when the company is quoted or seeking quotation on the London Stock Exchange." While forecasts are considered desirable, they are not required in takeover circulars.

FORECASTS IN SECURITY DOCUMENTS

The prospectus of an English company will generally include several paragraphs describing future prospects, such as forecasted profits, taxes, and dividend payments. This information is usually related to current year operations and may be issued only several months before year-end. It is traditionally a conservative projection, and the forecasted data are not directly attested to by an independent accountant. The accountant must give his consent, however, to the publication of his report (opinion) on the prior years' profits and net assets as of the last audited balance sheet date in the context that this information is presented. Usually a ten-year profit summary is presented, and the last audited balance sheet date cannot be more than nine months before the issuance of the prospectus. The expectation is that the accountant will not consent to

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publication of his previously issued opinion if he does not approve of forecasts contained in the same document.

In addition, comfort letters are often required by underwriters when an earnings forecast is included in a prospectus. The comfort letter describes assumptions of the forecast and the review of forecast preparation performed by the accountants. The comfort letter is a private document between the accountant and underwriter, is never referred to in conjunction with sale of the securities, and is merely in the form of negative assurance. 37

Under the City Code on Takeovers and Mergers, there is a requirement that if a forecast is published in a takeover document then it must be reported upon by an independent accountant. 38 Forecasts are not, however, required to be included in merger circulars. Rule 14 of the City Code states "shareholders must be put into possession of all the facts necessary for the formation of an informed judgment as to the merits or demerits of an offer. Such facts must be accurately and fairly presented and be available to the shareholder early enough to enable him to make a decision in good time." 39 Because of their importance to such a decision, forecasts are often published, and independent accountants are asked to report on these forecasts to avoid overconservatism or extreme optimism by

37 Ibid.
38 Carmichael, op. cit., p. 38.
management.

The English Institute of Chartered Accountants has prepared a suggested report form to be used when no qualifications exist with respect to the forecast. The accountants have no responsibility for preparing the projection; they merely perform an objective review of the accounting bases and computations, the extensions from underlying assumptions, and consistency with presently applied accounting principles. The accountants also have no responsibility for the validity or reasonableness of forecasting assumptions. There is a general agreement that independent accountants will not report on a forecast unless they are satisfied that underlying assumptions are reasonable. The accountants are in a position to advise management regarding the assumptions which should be described in the public report and must remain alert to the potential omission of important assumptions.

With respect to presentation, the future accounting period is generally limited to six to eighteen months because of the uncertain nature of forecasts. Point estimates are used rather than ranges; it is felt that ranges may become too wide to make them useful and that probabilities for projected amounts are more important than ranges. Detailed data are not presented because of the British preference for conciseness as well as the importance of distinguishing between historical and forecasted data. "If forecasted information can be compared line by line with historical information, an undesirable implication of comparable exactitude may result." Forecasts in prospectuses are almost always exceeded by actual results.

40Carmichael, op. cit., p. 43.
because of the conservative nature of the projections.41

To determine the relative accuracy of forecasts contained in takeover and merger circulars, a survey was conducted by the English Panel on Takeovers and Mergers. The period under review was from April, 1969 to early 1971. Profit forecasts of 210 companies were compared with actual results for the forecast period. For 81 per cent of the firms, actual profits were within a range of plus or minus ten per cent of the forecast. The survey did not distinguish between forecasts that were prepared for an annual period and projections for a shorter time span.

Of the 40 companies not within the ten per cent performance range, 18 firms supplied satisfactory explanations of variances; in 12 cases, forecast variation explanations were considered marginal; and the remaining 10 companies provided either no explanation or unsatisfactory ones concerning variances between actual and forecast. The general conclusion was that

about 17 per cent of forecasts are being missed; but about half of those, and possibly three-quarters, are misses which are explained by reference to the stated assumptions or covered by circumstances which are generally unforeseen. [Director General of the Panel, Ian J. Fraser] would describe this as a fairly satisfactory tally [as the time period covered involved] the worst economic recession experienced since the 1930s.42

ACCOUNTANTS' LIABILITY FOR FORECASTS

One of the major concerns in the United States in regard to accountants' association with profit forecasts is the extent of the CPAs' legal

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41Ibid., p. 37.

liability. This matter is not of great concern in the United Kingdom. Rule 15 of the City Code states "profit forecasts must be compiled with the greatest possible care by the directors whose sole responsibility they are [emphasis supplied]."43 The position of the independent accountants with respect to profit forecasts is to satisfy themselves as to the reasonableness of assumptions and that calculations in the forecast were made in accordance with the assumptions.

The Institute of Chartered Accountants recognizes that it is not possible to confirm or verify a forecast and that no actual audit, as the term is generally used, is being performed. The Institute does feel, however, that "within limits, accountants can properly undertake a critical and objective review of the accounting bases and calculations for profit forecasts and can verify that the forecasts have been properly computed from the underlying assumptions and data, and are presented on a consistent basis [with historical statement accounting principles]."44

It is continuously stressed that the primary responsibility for a forecast lies solely with the directors of a company. The earnings forecast must be formally adopted by the directors, and the major underlying assumptions must be published with the projection; guidance as to what is considered a major assumption is provided by the independent accountants. The reasoning for accountants' association with projections is simply to "ensure that forecasts are made realistically and responsibly."45

Five reasons are cited for the apparent lack of concern by Chartered

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43 Grenside, op. cit., p. 50.
44 Ibid., p. 51.
45 Damant, op. cit., p. 46.
Accountants with respect to liability. First, litigation against independent accountants is not extremely common in the United Kingdom. British lawyers cannot accept engagements on a contingent fee basis, and there can be no class actions or derivative suits. The accountant is not subject to the heavy burden of proof which applies to the CPA under the Securities Act of 1933 in the United States. Lastly, third-party suits against accountants are "just not done." General forecasting experience in the United Kingdom can serve as a useful model for developing certain practices in the United States. Important differences will undoubtedly emerge because of the distinct legal environment which prevails in this country.

CHAPTER SUMMARY

Important developments in forecast disclosure include the role of security analysts, changes in regulations of the Securities and Exchange Commission, experiments in forecast disclosure by certain companies, and forecasting practices in other countries. The traditional source of forecast information in the United States has been the security analyst. These analysts obtain complete forecasts from corporate management or receive sufficient information to permit the preparation of an earnings forecast. In either case, there are no guidelines to require disclosure of forecast methodology or underlying assumptions. Forecast information published by security analysts is distributed selectively to their clients or is not utilized by the general investor because availability of the data is not known.

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\(^{46}\text{Carmichael, op. cit., p. 42.}\)
Corporate management has always been reluctant to disclose forecast information to the general investing public because of potential problems with legal liability. In February, 1973, the Securities and Exchange Commission issued regulations to permit voluntary inclusion of forecasts in reports filed with the Commission. The regulations defined certain standards of preparation and disclosure that will apply to reporting companies and to issuing companies.

Fuqua Industries, Inc., issued public forecasts for 1973 and 1974. These forecasts were not filed under the SEC standards applicable to a reporting company. The firm experienced considerable problems in achieving its 1974 forecast and discontinued the program of issuing projections. In comparison with experience in the United States, forecasts are accepted disclosures in prospectuses and takeover circulars in the United Kingdom. Under certain circumstances, independent accountants review and report on the forecasts. Forecasting experience in the United Kingdom offers some guidance to practices which should be developed in this country.

 Numerous issues must be resolved before forecasts could ever be required disclosures or even a widely-accepted voluntary practice in this country. Analysis of the Fuqua Industries case indicated the need to develop forecast reporting principles regarding form and content of forecasts, updating procedures, and comparisons with attained results. These issues are examined in the remainder of this study.
CHAPTER IV

MODELS FOR FINANCIAL FORECASTING

The art of forecasting has developed from the rather simple estimation of causal relationships to its present state of highly complex computer models using numerous interrelated input variables. The purpose of this chapter is to trace the history of forecasting and to investigate the usefulness of computer models in preparing corporate financial forecasts.

In order to predict future operations using a sophisticated model, one must build that model with care and validate its output. Inputs must be analyzed in terms of their benefits and sensitivity of the model to them. Underlying assumptions must be made in order to establish the framework of the model. For a company to forecast, it should have some indications of general business trends, industry conditions, and its own market position. To generate this data requires highly complex budgeting and strategic information systems. For small company operations, such highly sophisticated systems would be unusual.

As an indication of how well computer models would forecast without the support of a large budgeting staff, the Delphi XX model will be applied to financial information provided by Communications Industries, Inc. This model uses past financial statement ratios as a starting point, but allows management great flexibility in changing or adjusting such
relationships. In this case application, the model will be run using a sales value for the next period and financial statement ratios of the preceding period. Forecast output generated by the model will then be compared to actual historical data to determine the accuracy of the forecast. Acceptable validation of the model would mean that small companies without extensive internal budgeting capability could prepare forecasts at a reasonable cost.

SUMMARIZED HISTORY OF FORECASTING

The management planning process invariably relates to actions and circumstances involving the future. In most cases, managers use past and present circumstances as bases for recommendations about future programs. However, the facilities, labor, capital, and other requirements necessary to implement such programs usually involve projections of future operating volume, environmental conditions, and other prevailing circumstances.

Managers plan in order to direct the course of controllable events and to avoid the adverse effects of uncontrollable future events. Alternative paths or directions can be explored, and separate courses of action are decided upon to bring about desired results. The more attention a company pays to its objectives or strategy, the clearer the choices and their consequences will be when the company interacts with the environment in which it operates.¹

A key aspect of planning is the revision of plans when new or better data emerge. Plans must consider alternative courses of action and these

alternatives should be evaluated in terms of the most accurate information which is available. Therefore, the best plan is usually a flexible one which allows new inputs to adjust and modify the basic assumptions and previously expected effects.

EARLY DEVELOPMENT OF FORECASTING

The art of planning has been practiced since the recorded beginning of mankind. Early forms of planning were simple and unformalized since there were few complex variables with which to deal. This environment was changed by the extension of the trading process and development of technology during the era of industrialization. Because of the greater processing capabilities and the greater capital outlays, more attention had to be given to planning.

The budget as a tool of planning dates back to the 18th century. In England, the annual accounting report delivered to Parliament by the Chancellor of the Exchequer was known as a budget. This report contained a statement of the past year's expenditures, an estimate of the coming year's expenditures, and a schedule of taxes and recommendations as to methods of levying the taxes. At this time, governments were the only institutions large enough to recognize the need for and have the capability of applying such estimating techniques.

In time, people outside government became concerned with planning. These early theorists developed a hypothesis that a properly constructed diagram could predict changes in business conditions. However, the earliest observers were inclined to rely specifically on one index. It

was during this period that Jevons, a noted English economist, elaborated his famous sun spot theory. Based on his calculations, sun spots controlled weather conditions on earth and, by observing these sun spots, one could predict general business conditions. According to his reasoning, the basis of prosperity depended on crop conditions. If the weather is good, food supplies will increase and prices will decline. Consumers could therefore use wages to purchase other goods, and businesses will prosper.³

Even if the causal relationship of sun spots with weather conditions had been proven, Jevons failed to consider other factors which might affect economic conditions. Like many people who try to predict future happenings, his error was in relying on a single index for precise results, but his work was an important step in trying to forecast business conditions. The next advance in forecasting was made by Bennon who postulated the rule that recessions invariably be followed at regular intervals by periods of prosperity. While recognizing a causal relationship between certain factors and business conditions, Bennon was misguided in that he thought there was a regular course of business cycles and that the course governed the causes.⁴

FORECASTS FOR BUSINESS USE

A development of note was the application of budgets in business practice. After 1900, budgets were used to a great extent in the United States for governmental and institutional purposes. Businessmen developed


⁴Ibid., p. 36.
interest in budget applications to business problems. Around 1900, Fayol began writing about administrative theory. In his 1916 publication, Fayol listed what he considered to be the elements of management. The first of these elements was a combined function of planning and forecasting. Fayol considered foresight to be a basic management necessity. A good plan of action was unified or supported by detailed plans, continuous through time, flexible in order to deal with unexpected events, and precise. Forecasts were to be prepared for both short and long-range periods and should be revised as necessary. The stress that Fayol placed on long-range planning was a unique contribution to management thought for his time.  

It is unusual that Fayol would place such an emphasis on long-range planning during a period when so little was known about budgeting or forecasting. Business budgetary acceptance is dated to 1922 with the publication by J. O. McKinsey of *Budgetary Control*. Early applications of budgets were primarily in the area of expenses and cost control, but budgetary planning was rapidly extended to deal with sales revenues and capital expenditures.

The art of forecasting was in its infancy in the 1920s. The theory of probability was mentioned during that period but was thought to offer limited assistance to forecasting. According to Jordan, "human intellect has not thus far developed the capacity simultaneously to comprehend and

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properly to coordinate all the possible happenings in economic activity..."\(^7\)

Little did anyone realize that in less than 40 years an "intellect"
would have been developed that could simultaneously deal with a great
many happenings and determine outcomes in mere minutes.

The naivety of the models used in the 1920s is shown by the following
quote: "Long -term forecasts are generally based on the assumption that
the rate of progress or retrogression experienced over a series of years
will continue into the future."\(^8\) Graphic presentations were considered
essential for purposes of prediction and planning. Many forecasting
models of today exhibit these same characteristics even though applicable
techniques have advanced a great deal.

The tentativeness of forecasts was noted, and recommendations for
review and revision of forecasts were included in texts on the subject.
Plans made from forecasts should be flexible in order to provide for un-
foreseen circumstances. Jordan felt that forecasts had definite value
"although a high degree of accuracy may never be gained in this field."\(^9\)
Accuracy has improved since Jordan's time, but forecasting is still an
art rather than an exact science.

In the 1930s, many books were written on budgeting and planning.
Most of these texts attempted to implement basic concepts, demonstrate
"how to" applications, and redefine terms rather than introducing new or
innovative techniques. Emphasis of procedures is explained by the fact

\(^7\)David F. Jordan, *Practical Business Forecasting* (New York: Prentice-

\(^8\)Ibid., p. 22.

\(^9\)Ibid., p. 129.
that businessmen finally wanted to know and understand some of the existing techniques in order to help them reconstruct business operations that suffered in the 1929 market decline.

COMPLEX FORECASTING MODELS

During World War II, industrial demand allowed enough businesses to become prosperous that writing on the subject of planning and forecasting was not in heavy demand. After this period, businessmen began to notice that techniques and devices used outside the business world might apply to business operations. Long-range planning and forecasting became important concepts to entrepreneurs.

In 1955, an article in Business Week summarized three basic approaches to forecasting. The loaded deck strategy attempts to find and use inside or as-yet-unknown information. This approach to forecasting was used by the earliest planners and is currently used to a great extent. Oaks-from-acorns is the second approach which assumes that the future grows out of the present. Trend extrapolation is a basic technique in this approach. This simple method was used by managers in the 1920s, and many managers use it even today regardless of the advances which have been made in the forecasting field.

Test-tube forecasting is the third approach which refers to the development of theoretical economic models which can be manipulated in an experimental manner. Test-tube forecasting or simulation has been popular in the 1970s because the models can be executed by computers and can

perform complex probabilistic simulation. Complex current business problems, advances in computer technology, and improved knowledge of quantitative methods have contributed to the development of simulation models for forecasting purposes.

Although accurate forecasting techniques have been developed, there are at least four valid reasons why companies are not using these techniques to the fullest extent. First, there is the short time period which is a constraint in many decision-making cases. Models require time for development, generation of input data, and interpretation of output. An additional deterrent is the inaccessibility of data needed for inputs to some models. Many times it is difficult to justify the time delay inherent in using models against the necessity of a quick estimation. The third reason against using models extensively is related to human nature. People resist change, and the use of model techniques requires training and a new outlook. Finally, models often make so many adjustments in attempting to reflect reality that the assumptions invalidate the results. 11 Models and simulation techniques for forecasting are available, and several successful applications have been documented in practice. The decision to use a forecasting model should consider the required investment to properly construct and validate the model.

MODELS AND VALIDATION PROCEDURES

For forecasting purposes, two types of models are generally used, predictive models and analytical models. Predictive models simply produce useful predictions, but they do not necessarily involve an understanding

of the underlying events which are predicted. A model which simply projects past trends into the future is a predictive model. On the other hand, analytical models consider and depict the basic relationships of the system components in order to make the model more accurate so that it can be manipulated for predictive purposes. Analytical models may generally produce better information, but users should evaluate the time and expense involved in development before insisting on an analytical model for forecasting purposes.

MODEL COMPONENTS

A descriptive review of sophisticated computer models is beyond the scope of this thesis, but a consideration of the data inputs required to operate a model is important. Basically there are three general categories of input for a corporate forecasting model, and these inputs require data concerning macro-economic assumptions, industry assumptions, and corporate assumptions. A model must also distinguish between controllable and uncontrollable variables. Relevant data include forecasts of economic conditions, industry trends, and specific corporate activities.

Before a company can prepare a forecast, it must have some indication of general economic conditions which can be expected. Macro-economic measures are usually relied upon as indicators of business conditions. Depending upon the particular industry, important economic measures may include disposable personal income or Gross National Product (GNP). There are governmental sources which prepare these indicators, and reliable economic predictions are published frequently.

Governmental sources also provide forecasts for several specific industries. For most major industry classifications, a forecast publication is available which has considered many basic variables such as
governmental spending, fixed business investment, residential construction, and consumer purchases. Prior year production, changes in technology, consideration of substitutes for some industry goods, and changes in consumer preferences are important factors in forecasts for both economic conditions and specific industries.

In preparing a financial forecast for a specific firm, the company first takes into consideration market demand for each of its major products. "Market demand for a product class is the total volume which would be bought by a defined customer group in a defined location in a defined time period under environmental conditions and marketing effort." The eight underlined terms must be carefully defined and evaluated before there can be any reliable forecast of market demand. In defining and evaluating these terms, a company establishes some of its basic forecasting assumptions.

To determine product class, the company must specify which of many potential markets it plans to penetrate. Volume can be measured in either physical or dollar volume terms, and the most useful measure should be incorporated into the demand estimate. "Bought" must be defined as volume ordered, shipped, paid for, consumed or some other measure. The customer group needs to be described as either the whole market or a specific segment. Well-defined geographical boundaries should be placed on location before trying to measure market demand. Time period should be explained in terms of calendar periods. Environmental conditions are those uncontrollable factors which affect demand and

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assumptions are required concerning technological innovation and consumer preferences. Alternative assumptions in this category can lead to completely different estimates of market demand. Finally, assumptions about marketing efforts or programs must be considered since demand in most markets is partially elastic in response to marketing effort.

Some of the assumptions made in forecasting market demand may also be helpful in expense estimation. Linear relationships are often valid even when business is expanding to handle increased demand. Simple linear regression can be used to analyze expense behavior, or more complex curvilinear relationships can be developed. After consideration of these diverse variables, an analytical model for complex business situations can be developed which allows the company to predict future trends in sales and expenses by simulation with the input variables. After model design is completed, the real test of its ability is accurate representation of outputs which the model was intended to generate. Managers are more likely to have confidence in a model which has been tested and proved to be reliable. Model validation describes the procedures used to demonstrate the reliability of a model.

MODEL VALIDATION

The technique of multistage validation is particularly applicable to computer models. First, a set of postulates must be derived to describe the system and its various functional relationships. Secondly, an attempt is made to validate these postulates by certain statistical tests. The third stage consists of testing the entire model's ability to predict the behavior of the system through historical validation or validation by
102

forecasting. With historical validation, the procedure is to determine whether the model can duplicate historical results of past time periods. Validation in this manner is a simulation of forecasting, since past results are already known. Validation by forecasting is actual use of the model to predict future performance. Some of the more sophisticated statistical techniques such as chi-square tests, factor analysis, spectral analysis, and nonparametric tests could also be used to test reliability of model outputs.

Depending on the complexity of the system under consideration, some of the basic steps in this validation process could be eliminated after a cost-benefit analysis is performed. This process would be most useful when the real-world system is exceedingly complex or when it would be too costly to observe the real-world processes. The following examples of forecasting models were properly validated to determine model reliability.

CORPORATE MODELS

The Republic Steel model for sales forecasting begins with a forecast of industry demand based on multiple correlation analysis between consumer durable goods expenditures, producers durable equipment, new construction, governmental expenditures, and a change in business inventory investment. The company then considers other major steel consuming activities and changes in consumer income which is important for predicting auto sales. The problem which Republic considers most difficult to solve is that of timing because few economic factors perform in

exactly a year's time period.\footnote{14} Burroughs Corporation has also developed a sales forecasting model. Burroughs first estimates the major variables affecting industry sales to derive a demand ceiling which is the maximum amount the market could absorb and a demand floor which measures replacement demand. The ceiling is calculated using population figures, level of living standards, and trends toward using electronic equipment. Floor demand is estimated by applying a wear-out formula to the equipment already in use. Burroughs then uses the difference between ceiling and floor to estimate potential demand. The industry order forecast is a portion of this potential demand based on economic conditions.\footnote{15}

Both the Republic Steel and Burroughs models are not complete corporate models since they only produce estimates for sales. The Sun Oil Company model is comprehensive in that it simulates the company's entire physical operations and accounting procedures. The inputs for this model include product prices and volume, raw material costs, general economic conditions, investments, subsidiary company income, and discretionary expense items. This model is composed of 2,000 equations and required 13 man-years to develop. In calendar years, development and implementation were completed in two and one-half years. A full list of the information required for model use is listed in Appendix A. A total of 1,500 inputs are necessary to simulate operations for one year, but only 50 inputs are critical.


\footnote{15}Ibid., pp. 107-108.
Based on the inputs, the model provides seven key reports which include an income statement, capital investment schedule, source and application of funds statement, statement of earnings employed and stockholders' equity, tax report, rate of return analysis, and financial and operating summary. In addition, several hundred pages of supporting schedules are generated.

All of these reports are potentially useful if they are reasonably accurate. If inputs are reasonably correct, the model can estimate corporate net income to within one per cent of actual net income on an annual basis. There are compensating errors in specific revenues and expenses, but the individual errors are generally less than three per cent.\(^\text{16}\)

**FINANCIAL PLANNING MODEL -- DELPHI XX**

Between the simplicity of the Burroughs and Republic Steel models and the complexity of the Sun Oil Company model, there are many useful computer models which can be used for forecasting. One model which works basically through ratio analysis and trend extrapolation is the Delphi XX which was developed by Arthur Young & Company. Delphi XX will produce balance sheets, income statements, financial analyses and ratios for five years with supporting data on a quarterly basis. The model requires answers to 52 input questions; input data are stated on a quarterly basis so that seasonality of assumptions can be reflected in the model.\(^\text{17}\) There is a specified chart of accounts and account relationships in the model.

The Delphi XX model "relies solely on the user's estimates of the


future quarter amounts and percentage relationships required as inputs."\textsuperscript{18}

After the user company makes basic assumptions regarding sales growth rates, costs, inventory and accounts receivable requirements, the Delphi XX will prepare quarterly financial statements for the next five years. Because of rapid execution time and simplicity of input requirements, a company can make various assumptions for input items in order to test the sensitivity of different factors.

DATA INPUT FOR DELPHI XX

A few of the input items are based on a single opening balance, including raw materials and finished goods inventory, accumulated depreciation, par value of common stock, and retained earnings. Other account items specify a beginning balance which can be adjusted if necessary on a quarterly basis; these items include investments, plant and equipment, land, short-term debentures, deferred taxes, long-term debt, shares of non-convertible preferred, convertible preferred and common stock outstanding, quarterly dividends on preferred and common stocks, convertible effect for use in computing earnings per share, and paid-in capital in excess of par. Income statement accounts which are determined independently of financial statement ratios are gross sales, sales growth rate, fixed direct labor cost, fixed overhead, depreciation rates, fixed administrative and selling expenses, interest rates on debt and reduction in interest expense due to conversion, extraordinary gains and losses, and price-earnings multiple on common. The tax rate is stated on an annual basis.

Other input items are expressed in ratio form. Cash and accounts

\textsuperscript{18}Ibid., p. 3.
receivable are computed as a ratio to net quarterly sales. Prepaid expenses and deferred charges are computed as percentages of total assets. Except for the beginning inventory figure, raw material and finished goods inventory accounts are stated as a percentage of total inventory, and total inventory is computed as a percentage of the next quarter's gross sales. Accounts payable and dividends payable are computed as percentages of quarterly purchases and dividends declared, respectively. Ratios are computed for taxes payable to tax expense and wages payable to direct labor cost. Short-term notes are computed in relation to total inventory plus net accounts receivable. Ratios for income statement items are sales discounts to gross sales, variable direct labor and variable overhead to cost of goods produced, and cost of goods sold, variable administrative expenses, and variable selling expenses as percentages of net sales. 19

The majority of input items for the model are applicable to most businesses. There are, however, certain factors which might cause imperfect information unless they are recognized. There is no Work in Process account, and all inventory is assumed to be raw materials or finished goods. 20 Marketable securities is a balancing account between assets and equities which is computed by subtracting all other assets from total equities. 21 Preferred stock is assumed to have a par value of $100. This amount can be changed, although it would require a change

19 Ibid., Sec. 2, Exhibit 2.
20 Ibid., Sec. 2, p. 2.4.
21 Ibid., Sec. 1, p. 1.9.
in the computer program. Finally, paid-in capital in excess of par is a single amount which is unallocated between preferred stock and common stock. Two items that the program is not equipped to handle are application of tax loss carrybacks and carryforwards and consolidation of divisions or subsidiaries.

OUTPUTS AND USES OF DELPHI XX

After all inputs are supplied to the computer program, eighteen reports are generated by the model. Quarterly income statements, balance sheets, and financial analyses for a five-year period are prepared in addition to an annual summary report for each type of statement. The first set of financial results for a five-year period can be generated in less than five minutes.

Delphi XX output can be used in many ways. With the ease of changing assumptions, companies can test the outcomes of various plans of action such as different product mixes or introduction of new products. The program could be used to show the ability of the company to cope with major changes such as economic recession or loss of a large customer. Seasonal financial requirements could be more easily identified. Possible corporate acquisitions could be programmed into the model to determine

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22Ibid., Sec. 1, p. 1.3.
23Ibid., Sec. 1, p. 1.4.
24Ibid., Sec. A, p. 3.
pro forma effects and help in decision-making about acquisition candidates. A final use which is very important is to establish an initial method of short-range planning for small or medium-sized companies. In the next section, data for Communications Industries, Inc., is used as input to the Delphi model in order to investigate the potential usefulness of such models in generating annual forecasts of net income.

CASE OF COMMUNICATIONS INDUSTRIES, INC.

One objective of this study is to investigate the usefulness of a computerized forecasting model as a supplement to or substitute for detailed budgetary projections. If a financial statement simulation model can produce reasonably accurate forecasts, then the technical aspects of corporate financial forecasting would be simplified considerably. A financial statement simulator would seem useful for forecasting purposes if it can generate forecasts that reasonably correspond with actual financial results reported by a company for specific past periods.

As described in Chapter I, Communications Industries, Inc. (CI) of Dallas, Texas, agreed to provide information concerning its past budgetary and actual financial performance. The company has over ten years of experience in profit planning and assembles comprehensive profit budgets for annual planning purposes. Summary budget information was provided by CI for its operations during the twelve-year period 1963-1974. This information was used for comparative analysis with publicly disclosed actual results and with output of the Delphi XX model.

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26 Ibid., pp. 7-8.
COMPANY BACKGROUND

Communications Industries, Inc., is thoroughly described in Chapter V which involves an empirical forecasting experiment for the year 1974. Since emphasis at this point is on forecasting models, only a brief outline of the company organization and business is provided in this chapter. The company provides products and services to the land mobile communications industry. This business involves the production, sale, and service of industrial radio equipment, including two-way radio antennas, radiotelephone terminals, and electronic signaling equipment. Principal markets for these products are original equipment manufacturers which assemble and sell complete systems to two-way radio, microwave, or radiotelephone users.27

The company started as a partnership in 1946 and by 1960 was operating in the corporate form with limited public ownership. With two public stock offerings in 1966 and 1968, CI had approximately 1,500 shareholders in 1974. The company has never had an unprofitable year and has paid dividends annually since 1964. Relative size of CI operations is provided by the following highlights from its 1974 annual report.28

<table>
<thead>
<tr>
<th>Communications Industries</th>
<th>December 31</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total assets</td>
<td>1974</td>
</tr>
<tr>
<td></td>
<td>$10,364,000</td>
</tr>
<tr>
<td>Net sales</td>
<td>17,941,000</td>
</tr>
<tr>
<td>Net income</td>
<td>1,385,000</td>
</tr>
<tr>
<td>Earnings per share</td>
<td>1.45</td>
</tr>
</tbody>
</table>

In past years and currently, CI has demonstrated a relatively good


ability to forecast sales volume and profits. In Exhibit 4.1, budgeted sales and budgeted income before taxes are disclosed for the ten-year period 1963-1972. In comparison with these budgeted amounts, actual results for the same years are shown as a percentage of respective budget amounts. In terms of budget accuracy, Exhibit 4.1 indicates that both sales and profit budgets generally tended to exceed actual results for each year. Sales budgets were more accurate as indicated by the fact that actual results fell within plus or minus eight per cent of budgeted sales during eight of the ten years. Actual income before taxes was within the range of budget plus or minus ten per cent only three times during the ten years.

Simple linear regression analysis was applied to the actual sales and net income of Communications Industries, Inc., for the ten-year period 1963-1972. This analysis was performed to determine the general predictability of revenues and earnings over time. In both cases, it was determined that sales and net income were not readily predictable by using regression equations. The regression equation for sales based on 1963-1972 is:

\[ Y = 2,695,000 + 645,000X. \]

The coefficient of determination for the sales regression is .37 which clearly indicates that sales growth is a function of variables other than time. Accordingly, traditional budgeting procedures and computer forecasting models cannot rely upon a linear growth trend for sales and net income.

The general budgetary procedure at CI is to develop sales estimates by product group and to forecast cost of goods sold and specific expenses using appropriate percentage and dollar amounts. Cash flow budgets are
EXHIBIT 4.1

COMMUNICATIONS INDUSTRIES, INC.

COMPARATIVE TRENDS IN BUDGETED AND ACTUAL
SALES AND INCOME BEFORE TAXES, 1963-1972

(Dollar Amounts in Thousands)

<table>
<thead>
<tr>
<th>Year Ending December 31</th>
<th>Net Sales</th>
<th>Income Before Taxes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Budget</td>
<td>Actual*</td>
</tr>
<tr>
<td>1963</td>
<td>$4,064</td>
<td>95%</td>
</tr>
<tr>
<td>1964</td>
<td>4,215</td>
<td>92</td>
</tr>
<tr>
<td>1965</td>
<td>4,715</td>
<td>98</td>
</tr>
<tr>
<td>1966</td>
<td>5,149</td>
<td>89</td>
</tr>
<tr>
<td>1967</td>
<td>5,663</td>
<td>102</td>
</tr>
<tr>
<td>1968</td>
<td>7,201</td>
<td>97</td>
</tr>
<tr>
<td>1969</td>
<td>8,146</td>
<td>92</td>
</tr>
<tr>
<td>1970</td>
<td>8,140</td>
<td>90</td>
</tr>
<tr>
<td>1971</td>
<td>8,064</td>
<td>102</td>
</tr>
<tr>
<td>1972</td>
<td>9,393</td>
<td>103</td>
</tr>
</tbody>
</table>

*Actual amounts expressed as a percentage of budget.
also prepared for working capital management, but the income statement budget is not integrated with a comprehensive development of pro forma balance sheets. Accordingly, the Delphi XX model was applied to past financial performance to determine if the model could have improved or otherwise supplemented the actual forecasting procedures employed in past years.

VALIDATION OF FORECASTING MODEL

To test the usefulness of the Delphi XX or a similar model, the six-year period 1968-1973 was selected for experimentation. The first phase was to determine whether the Delphi XX could duplicate actual income statement amounts reported for the five-year period 1968-1972. This validation procedure was designed to test the computer model and its ability to duplicate actual results when estimation and forecasting were not involved. If the model can duplicate actual financial statement results for particular years, then it could reasonably be used to forecast future operations.

The first step in developing model input data for the validation was to summarize CI balance sheets and income statements according to the format specified by the Input Questionnaire Worksheet prepared to accompany the model. Information from CI annual reports was assembled as shown in Exhibits 4.2, 4.3, and 4.4. Data from these financial statement exhibits were then entered into the Delphi XX Input Questionnaire which is contained in Appendix B of the study. This questionnaire requires account balance and ratio information replies to fifty-two specific questions. Much of this information is necessary to generate balance sheets, and accordingly the entire questionnaire and related replies are not presented in this chapter.
EXHIBIT 4.2

COMMUNICATIONS INDUSTRIES, INC.

ACTUAL BALANCE SHEET INFORMATION FOR 1968-1972

(Amounts in Thousands of Dollars)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>$240</td>
<td>$260</td>
<td>$368</td>
<td>$705</td>
<td>$755</td>
</tr>
<tr>
<td>Accounts receivable</td>
<td>1,179</td>
<td>1,301</td>
<td>1,127</td>
<td>1,367</td>
<td>1,431</td>
</tr>
<tr>
<td>Materials inventory</td>
<td>780</td>
<td>696</td>
<td>531</td>
<td>593</td>
<td>734</td>
</tr>
<tr>
<td>Finished goods</td>
<td>692</td>
<td>905</td>
<td>1,020</td>
<td>1,060</td>
<td>1,276</td>
</tr>
<tr>
<td>Prepaid expenses</td>
<td>19</td>
<td>18</td>
<td>19</td>
<td>24</td>
<td>30</td>
</tr>
<tr>
<td>Other investments</td>
<td>86</td>
<td>9</td>
<td>24</td>
<td>40</td>
<td>58</td>
</tr>
<tr>
<td>Plant and equipment</td>
<td>1,541</td>
<td>1,679</td>
<td>1,800</td>
<td>1,597</td>
<td>1,692</td>
</tr>
<tr>
<td>Accumulated depreciation</td>
<td>(597)</td>
<td>(768)</td>
<td>(951)</td>
<td>(948)</td>
<td>(1,040)</td>
</tr>
<tr>
<td>Land</td>
<td>133</td>
<td>133</td>
<td>134</td>
<td>126</td>
<td>47</td>
</tr>
<tr>
<td>Deferred charges</td>
<td>30</td>
<td>23</td>
<td>15</td>
<td>32</td>
<td>27</td>
</tr>
<tr>
<td>Total assets</td>
<td>$4,103</td>
<td>$4,256</td>
<td>$4,087</td>
<td>$4,596</td>
<td>$5,010</td>
</tr>
</tbody>
</table>

| Liabilities and Equity          |       |       |       |       |       |
| Accounts payable                | $643  | $505  | $354  | $488  | $451  |
| Dividends payable               | 40    | 40    | 39    | 49    | 32    |
| Taxes payable                   | 22    | 184   | 73    | 144   | 139   |
| Notes payable-current           | 69    | 69    | 68    | 66    | 66    |
| Deferred taxes                   | 91    | 109   | 96    | 82    | 86    |
| Long-term debt                  | 673   | 604   | 536   | 470   | 404   |
| Common stock at par             | 336   | 333   | 322   | 325   | 326   |
| Paid-in surplus                 | 782   | 742   | 673   | 690   | 703   |
| Retained earnings               | 1,447 | 1,690 | 1,926 | 2,282 | 2,803 |
| Total                           | $4,103| $4,256| $4,087| $4,596| $5,010|
EXHIBIT 4.3

COMMUNICATIONS INDUSTRIES, INC.

ACTUAL INCOME STATEMENT INFORMATION FOR 1968-1973

(Amounts in Thousands of Dollars)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Net sales</td>
<td>$6,910</td>
<td>$7,465</td>
<td>$7,308</td>
<td>$8,190</td>
<td>$9,623</td>
<td>$13,846</td>
</tr>
<tr>
<td>Cost of goods sold (a)</td>
<td>5,116</td>
<td>5,259</td>
<td>5,095</td>
<td>5,638</td>
<td>6,662</td>
<td>8,913</td>
</tr>
<tr>
<td>Gross margin</td>
<td>$1,794</td>
<td>$2,206</td>
<td>$2,213</td>
<td>$2,552</td>
<td>$2,961</td>
<td>$4,933</td>
</tr>
<tr>
<td>Depreciation</td>
<td>161</td>
<td>185</td>
<td>209</td>
<td>180</td>
<td>178</td>
<td>487</td>
</tr>
<tr>
<td>Administrative expense</td>
<td>1,141</td>
<td>1,340</td>
<td>1,313</td>
<td>1,496</td>
<td>1,664</td>
<td>2,290</td>
</tr>
<tr>
<td>Net interest expense</td>
<td>52</td>
<td>47</td>
<td>41</td>
<td>20</td>
<td>23</td>
<td>69</td>
</tr>
<tr>
<td>Extraordinary gain</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>(101)</td>
<td>(54)</td>
</tr>
<tr>
<td>Net income before taxes</td>
<td>$440</td>
<td>$634</td>
<td>$650</td>
<td>$856</td>
<td>$1,197</td>
<td>$2,141</td>
</tr>
<tr>
<td>Tax expense</td>
<td>218</td>
<td>330</td>
<td>316</td>
<td>403</td>
<td>546</td>
<td>996</td>
</tr>
<tr>
<td>Net income</td>
<td>$222</td>
<td>$304</td>
<td>$334</td>
<td>$453</td>
<td>$651</td>
<td>$1,145</td>
</tr>
<tr>
<td>Dividends declared</td>
<td>$81</td>
<td>$80</td>
<td>$79</td>
<td>$97</td>
<td>$130</td>
<td>$200</td>
</tr>
</tbody>
</table>

(a) See Cost of Goods Sold computation in Exhibit 4.4.
EXHIBIT 4.4
COMMUNICATIONS INDUSTRIES, INC.
COST OF GOODS SOLD ANALYSES FOR 1968-1972
(Amounts in Thousands of Dollars)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Materials inventory, January 1 (a)</td>
<td>$470</td>
<td>$780</td>
<td>$696</td>
<td>$531</td>
<td>$593</td>
</tr>
<tr>
<td>Purchases</td>
<td>2,409</td>
<td>2,105</td>
<td>1,919</td>
<td>2,333</td>
<td>2,892</td>
</tr>
<tr>
<td>Materials inventory, December 31 (a)</td>
<td>(780)</td>
<td>(696)</td>
<td>(531)</td>
<td>(593)</td>
<td>(734)</td>
</tr>
<tr>
<td>Cost of materials used (40%)</td>
<td>$2,099</td>
<td>$2,189</td>
<td>$2,084</td>
<td>$2,271</td>
<td>$2,751</td>
</tr>
<tr>
<td>Direct labor cost (30%)</td>
<td>1,574</td>
<td>1,641</td>
<td>1,563</td>
<td>1,703</td>
<td>2,063</td>
</tr>
<tr>
<td>Overhead cost (30%)</td>
<td>1,574</td>
<td>1,642</td>
<td>1,563</td>
<td>1,704</td>
<td>2,064</td>
</tr>
<tr>
<td>Cost of goods produced (c)</td>
<td>$5,247</td>
<td>$5,472</td>
<td>$5,210</td>
<td>$5,678</td>
<td>$6,878</td>
</tr>
<tr>
<td>Finished goods, January 1 (a)</td>
<td>561</td>
<td>692</td>
<td>905</td>
<td>1,020</td>
<td>1,060</td>
</tr>
<tr>
<td>Finished goods, December 31 (a)</td>
<td>(692)</td>
<td>(905)</td>
<td>(1,020)</td>
<td>(1,060)</td>
<td>(1,276)</td>
</tr>
<tr>
<td>Cost of goods sold (b)</td>
<td>$5,116</td>
<td>$5,259</td>
<td>$5,095</td>
<td>$5,638</td>
<td>$6,662</td>
</tr>
</tbody>
</table>

(a) Actual amounts reported in balance sheets.
(b) Actual Cost of Goods Sold reported in income statements less total depreciation which is a separate expense category.
(c) Delphi model computes Cost of Goods Sold by multiplying an input ratio times net sales. Cost of goods produced is then determined by adjusting for finished goods inventories, which include any work in process. For purposes of model input, it was assumed that cost of goods produced consists of overhead cost (30%), direct labor cost (30%), and material cost (40%). This assumption was required since this detailed actual information could not be determined. Purchases are computed by adjusting cost of materials used for raw materials inventories.
Primary interest in the computer model for this study lies in its ability to generate income statement results. The basic procedure for computing annual net income within the model is outlined as follows:

1. Sales are determined by summing estimates of quarterly sales volume in dollars.

2. Cost of goods sold is computed as an input percentage times sales.

3. Depreciation expense is determined by multiplying an input percentage times cost of plant and equipment at year-end.

4. Selling and administrative expenses are input values, and for CI all of these costs were assumed to be fixed.

5. Interest expense is computed by multiplying an input ratio times the sum of current and long-term notes payable.

6. Income tax expense is calculated as the input tax rate times income before taxes which is computed by subtracting items (2) through (5) from net sales.

7. Net income is sales less all expenses described in items (2) through (6).

For the income statement validation run, input values which are most critical to the simulation of actual income for 1968-1972 are summarized in Exhibit 4.5. These values were determined by reference to actual annual amounts summarized in Exhibits 4.2, 4.3, 4.4.

Program output for income statement validation purposes proved that the Delphi XX was accurate in duplicating actual profit results reported by the company during the five-year period 1968-1972. Sales, cost of goods sold, income before taxes, and net income generated by the model correspond almost exactly with the actual amounts shown in Exhibit 4.3. Small errors occurred because of using certain quarterly ratios, but the effect of these deviations was not material as the following comparisons indicate.
### EXHIBIT 4.5

COMMUNICATIONS INDUSTRIES, INC.

CRITICAL FACTORS FOR INCOME STATEMENT VALIDATION, 1968-1972

(Dollar Amounts in Thousands)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(34) Net sales per quarter</td>
<td>$1,728</td>
<td>$1,866</td>
<td>$1,827</td>
<td>$2,047</td>
<td>$2,406</td>
</tr>
<tr>
<td>(41) Ratio of cost of goods sold to net sales</td>
<td>.740</td>
<td>.704</td>
<td>.697</td>
<td>.688</td>
<td>.692</td>
</tr>
<tr>
<td>(42) Quarterly ratio of depreciation to gross plant and equipment</td>
<td>.026</td>
<td>.027</td>
<td>.029</td>
<td>.028</td>
<td>.026</td>
</tr>
<tr>
<td>(43) Fixed selling and administrative expenses</td>
<td>$285</td>
<td>$335</td>
<td>$328</td>
<td>$374</td>
<td>$416</td>
</tr>
<tr>
<td>(47) Quarterly interest rate on debt</td>
<td>.017</td>
<td>.017</td>
<td>.017</td>
<td>.017</td>
<td>.017</td>
</tr>
<tr>
<td>(49) Quarterly amounts for extraordinary gains</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>$25</td>
</tr>
<tr>
<td>(51) Average annual tax rate</td>
<td>.495</td>
<td>.520</td>
<td>.486</td>
<td>.471</td>
<td>.456</td>
</tr>
</tbody>
</table>
### Ratio of Simulated to Actual Annual Net Income

<table>
<thead>
<tr>
<th>Year Ending December 31</th>
<th>(Dollars in Thousands)</th>
<th>Ratio of Simulated to Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Actual</td>
<td>Simulated</td>
</tr>
<tr>
<td>1968</td>
<td>$222</td>
<td>$225</td>
</tr>
<tr>
<td>1969</td>
<td>304</td>
<td>308</td>
</tr>
<tr>
<td>1970</td>
<td>334</td>
<td>335</td>
</tr>
<tr>
<td>1971</td>
<td>453</td>
<td>446</td>
</tr>
<tr>
<td>1972</td>
<td>651</td>
<td>649</td>
</tr>
</tbody>
</table>

Balance sheet projections are not of primary importance given the limited current state of publicly disclosed forecasts, but the validation run also demonstrated the ability of the Delphi XX model to accurately simulate balance sheets. In almost every account classification, simulated amounts correspond substantially with actual balance sheet values summarized in Exhibit 4.2. Variations between actual and simulated results were generally caused by two factors, calculation of accounts payable and accumulated depreciation.

In the model, accounts payable are computed as a percentage of quarterly purchases. Purchases are computed residually as described in note (c) to Exhibit 4.4, which analyzes the cost of goods sold computation. Since historical information on purchases was developed in relation to an assumption concerning the relative percentage composition of materials cost, labor cost, and overhead cost, this method of computing accounts payable in the model produces an expected inaccuracy. The model also has no method to reduce accumulated depreciation for amounts related to fixed asset retirements. The combined effect of these two inaccuracies is not significant in relation to total assets as shown by the following comparisons.
(Dollars in Thousands)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Current assets:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Actual</td>
<td>$2,910</td>
<td>$3,180</td>
<td>$3,065</td>
<td>$3,749</td>
<td>$4,226</td>
</tr>
<tr>
<td>Simulated</td>
<td>2,810</td>
<td>3,185</td>
<td>3,133</td>
<td>3,962</td>
<td>4,489</td>
</tr>
<tr>
<td>Total assets:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Actual</td>
<td>$4,103</td>
<td>$4,256</td>
<td>$4,087</td>
<td>$4,596</td>
<td>$5,010</td>
</tr>
<tr>
<td>Simulated</td>
<td>3,988</td>
<td>4,236</td>
<td>4,107</td>
<td>4,577</td>
<td>4,956</td>
</tr>
<tr>
<td>Current liabilities:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Actual</td>
<td>$ 744</td>
<td>$ 798</td>
<td>$ 534</td>
<td>$ 747</td>
<td>$ 688</td>
</tr>
<tr>
<td>Simulated</td>
<td>655</td>
<td>769</td>
<td>542</td>
<td>723</td>
<td>632</td>
</tr>
</tbody>
</table>

Based upon the results of this validation experiment, it is concluded that the Delphi XX can be relied upon to generate reasonable income statement information. This conclusion is based only upon the demonstrated ability of the model to duplicate actual past results; this fact confirms that the technical structure and approach used by the model are satisfactory. If the various input ratios remain relatively stable over time, then the model could also generate reasonably accurate forecast information.

**COMPUTER-BASED FORECASTS**

Another purpose of this study is to determine whether a computer-based model can generate reasonably accurate forecasts. To test this point, the Delphi XX model was used to forecast the actual income statements of Communications Industries, Inc., for the five-year period 1969-1973. This test required certain assumptions about management ability to estimate operational factors for future annual time periods. It was assumed for model forecasting purposes that company management could estimate accurately future sales volume, additions to plant and equipment, fixed labor costs, fixed overhead costs, and fixed selling and administrative expenses.

To illustrate the basic procedure in using the model, it was assumed...
that a forecast for 1969 net income was to be developed at the end of 1968. Except for sales, capital expenditures, and the fixed cost amounts indicated above, it was assumed that all other 1968 actual financial statement ratios used in the model would also apply to 1969. Given actual results for 1968, a forecast of 1969 net income required few changes to the data base used in the validation run. A new data file was prepared for forecasting purposes using the assumptions described above. The objective was to duplicate the manner and circumstances in which CI management would have used the model for forecasting purposes. Specific account balance data were also adjusted so that the forecast for each year 1969-1973 would use known beginning of year balances for raw material inventory, finished goods inventory, accumulated depreciation, and retained earnings.

Income statement forecasts prepared by the computer model are compared with actual results for 1969-1973 in Exhibit 4.6. For 1970, 1971, and 1972, the model generated forecasts that correspond reasonably well with actual net income as indicated by the following analysis.

<table>
<thead>
<tr>
<th>Year Ending December 31</th>
<th>Annual Net Income (000)</th>
<th>Ratio of Forecast to Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Actual</td>
<td>Forecast</td>
</tr>
<tr>
<td>1970</td>
<td>334</td>
<td>298</td>
</tr>
<tr>
<td>1971</td>
<td>453</td>
<td>381</td>
</tr>
<tr>
<td>1972</td>
<td>651</td>
<td>593</td>
</tr>
</tbody>
</table>

A critical factor in forecasting accuracy with the Delphi XX model is the ratio of cost of goods sold to sales. Between 1968 and 1973, this ratio declined steadily from 74.0 per cent to 64.4 per cent, as computed from income statement amounts shown in Exhibit 4.3. The Delphi model was therefore consistently overestimating cost of goods sold when generating a forecast for a particular year based on results in the prior year.
EXHIBIT 4.6

COMMUNICATIONS INDUSTRIES, INC.

COMPUTER-BASED FORECASTS COMPARED WITH

ACTUAL PROFIT RESULTS FOR 1969-1973

(Amounts in Thousands of Dollars)

<table>
<thead>
<tr>
<th>Annual Results</th>
<th>Net Sales</th>
<th>Cost of Sales</th>
<th>Income before Taxes</th>
<th>Net Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>1969 - Forecast</td>
<td>$7,464</td>
<td>$5,523</td>
<td>$386</td>
<td>$195</td>
</tr>
<tr>
<td>Actual</td>
<td>7,465</td>
<td>5,259</td>
<td>634</td>
<td>304</td>
</tr>
<tr>
<td>1970 - Forecast</td>
<td>$7,308</td>
<td>$5,145</td>
<td>$621</td>
<td>$298</td>
</tr>
<tr>
<td>Actual</td>
<td>7,308</td>
<td>5,059</td>
<td>650</td>
<td>334</td>
</tr>
<tr>
<td>1971 - Forecast</td>
<td>$8,188</td>
<td>$5,707</td>
<td>$741</td>
<td>$381</td>
</tr>
<tr>
<td>Actual</td>
<td>8,190</td>
<td>5,638</td>
<td>856</td>
<td>453</td>
</tr>
<tr>
<td>1972 - Forecast</td>
<td>$9,624</td>
<td>$6,621</td>
<td>$1,121</td>
<td>$593</td>
</tr>
<tr>
<td>Actual</td>
<td>9,623</td>
<td>6,662</td>
<td>1,197</td>
<td>651</td>
</tr>
<tr>
<td>1973 - Forecast</td>
<td>$13,844</td>
<td>$9,580</td>
<td>$1,764</td>
<td>$960</td>
</tr>
<tr>
<td>Actual</td>
<td>13,846</td>
<td>8,913</td>
<td>2,141</td>
<td>1,145</td>
</tr>
</tbody>
</table>
Forecasted net income in Exhibit 4.6 is accordingly less than actual profits reported each year.

There is reasonable correspondence between forecast and actual net income for 1970, 1971, and 1972 primarily because the difference between actual and forecasted cost of sales percentage was less than one per cent. This difference is considerably larger in 1969 and 1973 and caused most of the variance between forecast and actual profits for these two years, as indicated by the following analysis.

<table>
<thead>
<tr>
<th>(Dollar Amounts in Thousands)</th>
<th>1969</th>
<th>1973</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income before taxes:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Actual</td>
<td>$634</td>
<td>$2,141</td>
</tr>
<tr>
<td>Forecast</td>
<td>(386)</td>
<td>(1,764)</td>
</tr>
<tr>
<td>Difference</td>
<td>$248</td>
<td>$377</td>
</tr>
<tr>
<td>Cost of sales percentage:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Forecast</td>
<td>74.0%</td>
<td>69.2%</td>
</tr>
<tr>
<td>Actual</td>
<td>(70.4)</td>
<td>(64.4)</td>
</tr>
<tr>
<td>Variance</td>
<td>3.6%</td>
<td>4.8%</td>
</tr>
<tr>
<td>Sales</td>
<td>$7,465</td>
<td>$13,846</td>
</tr>
<tr>
<td>Sales times variance</td>
<td>$269</td>
<td>$665</td>
</tr>
</tbody>
</table>

The cost of sales percentage analysis explains the difference between forecast and actual results for 1969. In 1973, however, depreciation expense in the actual income statement exceeded the forecast amount by $311,000. During 1973, Communications Industries, Inc., acquired another company in a stock for stock exchange which was accounted for as a pooling of interests. This event is not the type which reasonably could be anticipated when compiling annual budgets. The resulting increase in fixed assets and related depreciation expense was therefore not included in the forecast data base.

To minimize the forecast to actual reconciliations, however, forecast sales for 1973 were based on actual amounts reported for that year, including the newly acquired firm. In Chapter VI, this business combination
is examined in connection with its impact on how forecasts and actual results should be compared and reported. The following reconciliation explains the difference between forecast and actual income before taxes during 1973.

<table>
<thead>
<tr>
<th></th>
<th>Dollars in Thousands</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income before taxes - 1973 forecast</td>
<td>$1,764</td>
</tr>
<tr>
<td>Plus: Excess cost of sales in forecast over actual amount</td>
<td>665</td>
</tr>
<tr>
<td>Minus: Excess of actual depreciation expense over forecast amount</td>
<td>(311)</td>
</tr>
<tr>
<td>Plus: Effect of all other differences</td>
<td>23</td>
</tr>
<tr>
<td>Income before taxes - 1973 actual</td>
<td>$2,141</td>
</tr>
</tbody>
</table>

In using the Delphi XX to forecast income statements for 1969 through 1973, there is reasonable evidence that such models could supplement detailed budgetary projections developed by conventional procedures. Since forecasting analysis with the model used actual sales and administrative expenses as input values for 1969-1973, it is clearly not justifiable to claim that the model is better than traditional procedures.

The validation and forecasting exercises have demonstrated, however, that such computer models could produce useful forecasts if management estimates of future sales volume and fixed operating expenses are accurate and if financial statement relationships remain fairly stable over time. If these two conditions are satisfied, then a forecasting model based on logic such as the Delphi XX could provide a substitute for conventional budgeting procedures which begin with estimates of detailed cost, volume, and operating factors and compile these amounts into summary totals. In such cases, the model simply replaces or provides the mechanism used to formulate forecast information.
CHAPTER SUMMARY

The history of economic and financial forecasting provides insight for the problems and procedures involved in the current art of forecasting. Models of various types have been developed over time to predict, explain, and analyze many economic variables. The use of models in corporate financial forecasting for short-time periods requires the same attention to model structure and validity as does the study of more complex models for macro-economic or industry considerations.

An objective of this study was to investigate the usefulness of a computerized forecasting model as a supplement to or a substitute for detailed budgetary projections within a specific firm. The Financial Planning Model, Delphi XX, developed by Arthur Young & Company, was used for such testing. The model generates balance sheets and income statements for a five-year period with supporting quarterly reports based upon replies to 52 questions concerning account balances and financial statement ratios.

The Delphi XX model was validated by determining that the model could duplicate actual income statement amounts reported by Communications Industries, Inc., during the five-year period 1968-1972. It was determined that model structure was logical and that realistic output results were obtained. The model was used to produce forecasts of net income for the five-year period 1969-1973. Forecasts and actual results were reconciled, and the model was judged to be an adequate procedural device for processing management estimates of sales volume and fixed cost amounts. Accuracy in forecasting with the Delphi XX depends upon the relative stability over time of certain financial statement ratios, in particular
cost of goods sold to net sales.

In Chapter V, the results of an empirical forecasting experiment with Communications Industries, Inc., are related to the current problem of public disclosure of corporate forecasts. Analysis in this chapter has indicated that computer models can supplement the process of developing such budgetary data.
CHAPTER V

ANALYSIS OF AN EMPIRICAL FORECAST EXPERIENCE

An objective of this study is to provide the accounting profession with insight regarding the experience base necessary for auditing corporate financial forecasts. A frequent problem cited in conjunction with published forecasts is that company managements and CPAs lack the required experience with forecasting to assess the potential problems involved. This experience is gained only by practice and experimentation. This chapter reports upon the results of an actual forecasting experiment for the calendar year 1974 and contributes to the experience base which must be developed by the accounting profession.

Communications Industries, Inc., of Dallas, Texas, participated in the simulated profit forecast experiment for 1974. This firm, with annual sales under $20 million, manufactures peripheral equipment and renders other services to the electronic communications market. For purposes of this study, the company provided a 1974 consolidated forecast which, in management opinion, was suitable for public disclosure, although public disclosure was not made. Actual results for 1974 are compared with this forecast, and significant matters of assumptions, technical forecasting problems, and explanation of important variances are addressed.
ORGANIZATION OF COMMUNICATIONS INDUSTRIES, INC.

The electronic communications industry is an extremely large, dynamic force in today's economy. Presently estimated at $600 million per year in total sales, the industry is rapidly growing due to increased technology, more favorable regulatory decisions, and interindustry consolidations. Communications Industries, Inc., is a small firm in the vast field of radio and telecommunications. However, the company plays a leading role in the class of smaller firms within the industry as compared to such giants as General Electric, RCA, and Motorola.

COMPANY BACKGROUND

Communications Industries was founded as a partnership in 1946 by two friends from military radar school. The friends, Jerry S. Stover and Tom J. McMullin, were electrical engineers; their business objective was to introduce radio communication to isolated oil drilling operations. At the time the venture was started, personal communication was the only means of contact for drilling personnel. Two-way radio would be a substantial improvement, but the communications devices needed to be able to withstand mud, oil, and other normal operating conditions of the drilling operations. With hard work, almost every oil rig in Texas and Oklahoma soon sported a two-way radio antenna of Communications Industries.

After its beginning in sales and service of two-way equipment, CI began manufacturing land mobile field antennas in 1948. The 1950s saw the company expand even more through distribution of two-way radio parts.

A radio common carrier was purchased in 1960, Secode Electronics in 1967, and General Communications Services of Tucson in 1973. Since the start of operations, CI's sales have approximately equaled the ten per cent annual industry growth rate. Net income of the firm has increased at about twice that rate for most years.  

Communications Industries does not try to compete with the electronics giants in the manufacture of basic communications equipment because it does not have the marketing resources necessary for such an undertaking. Instead, CI makes the specialized peripheral equipment needed to complete radio systems. It then sells these antennas, signalling devices, terminals, and other equipment to end users and to original equipment manufacturers (OEMs) such as GE, Motorola, and RCA. These firms then use CI components in a total communications system and use their sales forces to sell to oil companies, police departments, and other customers. In 1972 and 1973, respectively, CI derived 22 per cent and 25 per cent of its revenues from products sold to or through OEMs.

COMPANY DIVISIONS

Communications Industries, Inc., is an operating company which includes four wholly-owned subsidiaries: Communications Engineering Company; Decibel Products, Inc.; Com-Supply, Inc.; and General Communications

2Blake, ibid.
3Ibid.
The operations of Communications Industries, Inc., are in the two areas of products and services. The Products Group consists of two manufacturing operations, Decibel Products, Inc., and Secode Electronics Division, and a parts distribution operation, Com-Supply, Inc. These divisions are located in the Dallas area and provide the land mobile and electronic industries with products and services. The majority of items offered by these autonomous operations are of standard design, although special orders are also handled.

Decibel Products is one of the top two or three firms in the land mobile radio antenna field in terms of sales and prestige. The Decibel line consists of products which radiate or filter radio frequency energy between the base station and the mobile unit. These items are sold worldwide. The demand for products in this area is expected to increase substantially since the Federal Communications Commission (FCC) has allocated new broadcasting space in the two-way radio and microwave frequencies.

Secode Electronics is a major domestic manufacturer of electronic signalling and control equipment for land mobile radio communications. The division was acquired in 1967 for $150,000. Included in the investment

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7Blake, ibid., p. 2.

were designs for a decoder that knew which telephone to ring on a party line and for mobile telephone control units. With little preliminary preparation, CI attempted to shift from manufacturing simple, job-shop devices to sophisticated assembly line and marketing operations. This venture was not an immediate success. 9

It took until the fourth quarter of 1970 to get Secode into a profitable position, but the division is now a major profit center in CI. Secode's newest products contributing to profitability are the SMART system which allows mobile telephone direct dialing and billing and the RAPID system which is a remote alarm system that allows companies to control and monitor equipment in remote locations. 10

Com-Supply distributes parts for two-way radio communications systems throughout the United States and Latin America. The division does not provide over-the-counter distribution; it tailors its services to fit customers' needs from a centralized location. 11 Com-Supply's customers include large industrial accounts such as oil companies, telephone companies, and state and local governments.

The Services Group of Communications Industries is composed of General Communications Service, Inc. (GCS) and Communications Engineering Company (CECO). 12 GCS is a licensed radio common carrier (RCC) operation which was acquired in August, 1973. RCCs were created by the FCC in 1949

10Ibid.
12Ibid., pp. 10-11.
to provide competitive radio-telephone service to wireline telephone
groups.\footnote{Earp, Kenney & Smith, \textit{op. cit.}, p. 4.} Services provided by RCCs include car telephones, answering
services, and pocket paging. GCS is believed to be the largest and most
profitable of an estimated 650 radio common carriers in the United
States.\footnote{Rauscher Pierce Securities Corporation (November 9, 1973), \textit{op. cit.}} GCS was acquired through a pooling of interests transaction.
The division provides a full range of the above mentioned common carrier
services and is licensed to operate in Atlanta, Phoenix, Tucson, and
Flagstaff, Arizona.

Communications Engineering Company installs and services two-way
radio systems, data communications, and medical electronics equipment.
CECO is one of the largest radio communications service organizations in
the country, and it maintains over 1,000 radio communications systems and
over 1,000 data communications terminals. During 1973, CECO completed
the installation of the mobile communications systems and a service
facility at the Dallas-Fort Worth International Airport, and several large
new service contracts have recently been received by CECO.\footnote{Communications Industries, Inc., \textit{1974 Annual Report}, \textit{op. cit.}, p. 11.} Efforts are
being made on the part of management to increase profits from this divi-
sion; one necessary decision was made to terminate the sales and service
of private telephone systems which had not been a profitable operation.

INDUSTRY AND COMPETITION

The $600 million market in which CI participates consists of roughly
$400 million in manufactured equipment, $100 million in servicing, and
$100 million in common carrier revenues. The equipment and service mar­kets are dominated by Motorola and General Electric which hold an estimated 60 per cent and 20 per cent, respectively. Communications Industries cultivates both of these major firms as customers of its peripheral equipment.

The radio common carrier segment of the industry has emerged as a rapidly expanding area and, with the allocation of more MHz channels by the FCC, land mobile telephones are expected to increase. Whenever the FCC has increased the available channels, shortly afterwards a noticeable increase in industry equipment sales has resulted. Also, with the current energy shortage, usage of pocket pagers, two-way radios, and mobile telephones is projected to increase.

In the area of competition, CI's antenna business has avoided com­peting with lower priced, less sophisticated lines by directing their focus toward users with complex installations such as public safety and petroleum. In the RCC market, CI and all other common carriers face competition from general landline telephone companies which also offer mobile services, although RCCs have maintained a competitive advantage in this area by their ability to provide more specialized and personalized services. Exhibit 5.1 presents a five-year summary of operations and selected financial information for Communications Industries. These data have been re­stated to reflect the pooling of interests transaction to acquire a sub­sidiary firm in late 1973.

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16 Ibid., p. 4.
17 Earp, Kenney & Smith, op. cit., p. 3.
18 Ibid., p. 12.
EXHIBIT 5.1

COMMUNICATIONS INDUSTRIES, INC.

SUMMARY OF OPERATIONS AND FINANCIAL CONDITION, 1969-1973

(Dollar Amounts in Thousands)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales (a)</td>
<td>$13,846</td>
<td>$11,505</td>
<td>$9,912</td>
<td>$8,744</td>
<td>$8,520</td>
</tr>
<tr>
<td>Income before income taxes</td>
<td>2,141</td>
<td>1,474</td>
<td>1,086</td>
<td>732</td>
<td>650</td>
</tr>
<tr>
<td>Income taxes</td>
<td>996</td>
<td>655</td>
<td>505</td>
<td>349</td>
<td>331</td>
</tr>
<tr>
<td>Net income</td>
<td>1,145</td>
<td>819</td>
<td>581</td>
<td>383</td>
<td>319</td>
</tr>
<tr>
<td>Net income per share</td>
<td>1.20</td>
<td>0.88</td>
<td>0.65</td>
<td>0.42</td>
<td>0.35</td>
</tr>
<tr>
<td>Average shares outstanding (000)</td>
<td>952</td>
<td>932</td>
<td>899</td>
<td>917</td>
<td>924</td>
</tr>
<tr>
<td>Dividends per share</td>
<td>0.21</td>
<td>0.20</td>
<td>0.15</td>
<td>0.12</td>
<td>0.12</td>
</tr>
<tr>
<td>Working capital</td>
<td>3,579</td>
<td>3,375</td>
<td>2,865</td>
<td>2,439</td>
<td>2,380</td>
</tr>
<tr>
<td>Current assets/liabilities</td>
<td>3.0</td>
<td>4.1</td>
<td>3.5</td>
<td>4.0</td>
<td>3.3</td>
</tr>
<tr>
<td>Long-term debt</td>
<td>860</td>
<td>1,009</td>
<td>1,117</td>
<td>1,242</td>
<td>1,184</td>
</tr>
<tr>
<td>Stockholders equity</td>
<td>5,563</td>
<td>4,402</td>
<td>3,432</td>
<td>2,950</td>
<td>2,732</td>
</tr>
<tr>
<td>Equity per share (b)</td>
<td>5.83</td>
<td>4.86</td>
<td>3.80</td>
<td>3.29</td>
<td>2.97</td>
</tr>
<tr>
<td>Net income/sales %</td>
<td>8.3</td>
<td>7.1</td>
<td>5.9</td>
<td>4.4</td>
<td>3.7</td>
</tr>
<tr>
<td>Net income/average equity %</td>
<td>23.0</td>
<td>20.9</td>
<td>18.2</td>
<td>13.5</td>
<td>11.7</td>
</tr>
<tr>
<td>Net income/average assets %</td>
<td>15.2</td>
<td>13.1</td>
<td>10.4</td>
<td>7.3</td>
<td>6.2</td>
</tr>
</tbody>
</table>

(a) All amounts have been retroactively adjusted to reflect the pooling of interests transaction completed in 1973.

(b) Based upon shares outstanding at year-end.

BUDGETARY PLANNING SYSTEM

Communications Industries, Inc., has more than ten years of experience with budgeting and annual profit planning procedures. Company management is actively involved with this planning system and, in 1971, established a general five-year program to achieve certain growth rates in sales, net income, and earnings per share. As described in Chapter IV, the budgeting system concentrates on sales, cost of sales, operating expenses, net income, and cash flows. Pro forma balance sheets are not developed, and the basic approach to cash flow analysis is to adjust net income for non-cash components.

Sales budgets are developed on an annual basis for all company segments which include wholly owned subsidiaries and operating divisions. In some cases, initial budgets are formulated by the CI central accounting office and submitted to field personnel for review, revision, and approval. Actual sales volume estimates are first developed by field personnel for some products and services. Sales budgets and proposals are reviewed by top management and approved by company officials who will be responsible for achieving actual results.

Since the company sells manufactured products, parts, and services, there is a combination approach used in quantifying the various individual sales budgets. Physical sales volume and related selling prices are budgeted when possible. In other areas, total dollar sales volume is estimated in total. Sales budgets in final form are prepared with monthly detail and year-to-date expectations. Intercompany sales are also budgeted so that consolidated annual sales can be determined.

Sales mix and gross profit differentials are important considerations in the total sales budget. Since sales budgets are determined by company
segments and for related products within each responsibility unit, sales mix becomes an inherent assumption when the total sales budget is compiled. The composition of 1973 actual sales and gross profits is presented below according to major classes of products and services.\(^\text{19}\)

<table>
<thead>
<tr>
<th>1973 Operations</th>
<th>Sales</th>
<th>Profit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common carrier operations</td>
<td>19%</td>
<td>22%</td>
</tr>
<tr>
<td>Service and rentals</td>
<td>17</td>
<td>9</td>
</tr>
<tr>
<td>Distribution</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>49</td>
<td>54</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Cost of goods sold for manufactured items is determined from standard cost information. The company has developed a standard prime costing system for internal use. The raw material and direct labor cost of manufactured units has been analyzed, and current estimates of these standards are used in computing the prime cost element for cost of goods sold. Manufacturing overhead costs and administrative expenses are traced on a line-item basis to the company segment which incurs these costs. Monthly performance reports are prepared using the concept that all costs traceable to a company segment are controlled by the segment manager. Cost of goods sold and other operating expenses are therefore budgeted by responsibility unit following general ledger cost classifications.

There are both procedural and behavioral problems involved in the budgeting system. Raw material prices are subject to increases throughout the year, and expanding operations sometimes require unplanned personnel additions. In the past, certain managers have tended to underestimate revenues and to overestimate costs so that actual results appear favorable.

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at year-end. This tendency is being eliminated by a proven record of using the annual budget as a planning device and not as an inflexible goal. In general, the profit planning system is designed to produce realistic and achievable goals for an annual period.

FORECAST OF 1974 OPERATIONS

The simulated forecasting experiment for 1974 required the company to develop a pro forma income statement that would be suitable for public disclosure. This study is referred to as an experiment or simulation because the resulting forecast was not actually distributed as was the case with Fuqua Industries. The purpose of this experiment was to provide a controlled experience in analyzing the problems, assumptions, and comparative accuracy involved in financial forecasting. The research plan was to obtain the simulated forecast in January, 1974, to monitor progress and problems involved with achieving the forecasted sales and net income, and to comparatively analyze actual results for the year.

The initial forecast was obtained in January, 1974, and is presented in Exhibit 5.2 which also comparatively discloses actual results for 1973. Plans for 1974 involved a 15 per cent increase in sales and a 25 per cent increase in net income. In early 1974 these expectations appeared reasonable and achievable in view of past sales and earnings growth. Sales growth after restatement for the pooling of interests in 1973 was 13 per cent in 1971, 16 per cent in 1972, and 20 per cent in 1973. The percentage increase in net income during these years was 52 per cent in 1971, 41 per cent in 1972, and 36 per cent in 1973. The forecasted ratio of net income to sales, nine per cent, is reasonable in comparison with the prior year and improvements over time shown in Exhibit 5.1.

The forecast presented in Exhibit 5.2 is the budgeted income
EXHIBIT 5.2

COMMUNICATIONS INDUSTRIES, INC.

INITIAL FORECAST FOR 1974 COMPARED WITH

ACTUAL RESULTS FOR 1973

(Dollar Amounts in Thousands)

<table>
<thead>
<tr>
<th></th>
<th>1973 Actual</th>
<th>Per cent of Sales</th>
<th>1974 Initial Forecast</th>
<th>Per cent of Sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net sales</td>
<td>$13,846</td>
<td>100%</td>
<td>$15,876</td>
<td>100%</td>
</tr>
<tr>
<td>Cost of sales and expenses</td>
<td>(11,705)</td>
<td>(85)</td>
<td>(13,184)</td>
<td>(83)</td>
</tr>
<tr>
<td>Net operating income</td>
<td>$ 2,141</td>
<td>15%</td>
<td>$ 2,692</td>
<td>17%</td>
</tr>
<tr>
<td>Income taxes</td>
<td>(996)</td>
<td>(7)</td>
<td>(1,265)</td>
<td>(8)</td>
</tr>
<tr>
<td>Net income</td>
<td>$ 1,145</td>
<td>8%</td>
<td>$ 1,427</td>
<td>9%</td>
</tr>
<tr>
<td>Earnings per share</td>
<td>$ 1.20</td>
<td></td>
<td>$1.49</td>
<td></td>
</tr>
</tbody>
</table>

Forecast represents the following percentage increases over 1973:

- Sales 15%
- Net income 25%
- Earnings per share 24%
statement for consolidated operations of CI during 1974. Because of the company's approach to budget formulation, management did not consider it necessary to decrease budgeted sales and profits in order to provide a forecast suitable for public disclosure. In management opinion, budgeted sales of $16 million and net income of $1.4 million represented the most probable results of operations as of January, 1974. In this case, the terms forecast and budget have the same meaning and are used interchangeably in this analysis.

With regard to general standards of presentation, the 1974 forecast is expressed in a format that is similar to historical financial statements which are conventionally issued. The forecast was limited to a highly condensed income statement with related earnings per share disclosure. The company wished to restrict its disclosure to principal income statement components and to omit product line forecasts and supporting information. The restricted disclosure or highly condensed income statement does simplify the required explanations when actual amounts are subsequently compared with the forecast.

In spite of the condensed nature of information which comprises the forecast, it should be recognized that this presentation complies with the following standards proposed by the Forecasting Task Force of the AICPA in "Standards for Systems for the Preparation of Financial Forecasts":

1. **Single most probable result.** The initial forecast presents the single most probable results of operations considered likely by management.

2. **Accounting principles used.** The forecast is based on the same accounting principles and methods which will be applied to actual transactions.

3. **Appropriate care and qualified personnel.** The forecast was developed in accordance with the procedures described in relation to the company's budgetary
planning system.

4. **Reflection of plans.** Information used in preparing the forecast represents management plans.

5. **Adequate documentation.** The budgetary system used to compile the forecast contains adequate documentation of both the forecasting process and the resulting estimates.

6. **Adequate review and approval.** The final forecast was appropriately reviewed and approved by company management.

This standards document referred to above also suggests that forecasts should be regularly compared with actual results. Regular comparisons, updating of forecasts when required, and year-end explanations of variances are recognized by company management as essential elements of any program involving publicly disclosed forecasts. The same standards document suggests that assumptions used in a financial forecast should be reasonable, appropriate, and suitably supported.

**FORECAST ASSUMPTIONS AND REVISIONS**

A forecast is based on assumptions by management concerning the internal and external events, conditions, and circumstances that most likely will prevail or occur during the forecast period. Assumptions are important because they ultimately determine the quality and achievability of the forecast. Preparation of a financial forecast requires estimates of sales growth rates, material and labor prices, market conditions, and other profitability factors. External considerations such as national


economic trends and actions by competitors must also be assessed. Significant assumptions affecting the potential achievability of a forecast should be disclosed, and the forecast should be revised during the year to reflect changing conditions and related assumptions.

**DISCLOSURE OF RELEVANT ASSUMPTIONS**

Identity of important assumptions which should be disclosed is a difficult problem requiring judgment and analysis. Because of the numerous assumptions involved in any forecast, it is not feasible to develop a standard list of items to be disclosed for every company. Important assumptions that should be disclosed are those which are critical to the achievability of forecasts. Critical in this case means that validity and accuracy of the assumptions are conditions precedent to the realization of the forecast. Relative risk is therefore important and involves assumed conditions that may not materialize or predicted factors that are different from past experience.

Key factors of the following nature should be disclosed when financial results of the business firm are dependent upon their validity:

1. Assumptions for which there is reasonable possibility of a variation which could significantly affect forecasted results;

2. Assumptions about expected conditions that are forecasted to be materially different from current conditions;

3. Management plans, policies, estimates or other matters essential to an interpretation of the forecast.\(^{22}\)

Important assumptions should be supported by reasonable evidence.

At the time of preparing a forecast, it is impossible to demonstrate that

particular assumptions will prove to be true. Evidence to support management conclusions may consist of trends based on actual past data, economic and financial estimates prepared by outside experts or consultants, and reference to currently prevailing conditions. Evidence involves information, data, facts, and analysis of conditions existing at the time a forecast is prepared.

In preparing the initial forecast for CI operations in 1974, assumptions were not specifically documented by the company in a form suitable for simple listing in this study. Assumptions by their very nature are implicit in the forecasting process and must be identified by analysis and logic. The following assumptions were identified by analysis of prior year operations and discussion with the company controller.23

1. Corporate structure. The 1974 forecast is based on the existing corporate structure, and there are no plans to acquire or dispose of subsidiary companies during the year.

2. Availability of materials. While aluminum, copper, brass, and purchased parts used in manufacturing operations are readily available, temporary shortages and delayed deliveries could affect operations. Disruptions are not expected to be worse than experience in the prior year.

3. Inflationary trends. Wage and price controls are expected to terminate in 1974, and provision for increased material and labor costs is included in the forecast.

4. Regulatory environment. The Federal Communications Commission is expected to finalize the allocation of new frequencies to land mobile users. This action will assure long run growth in all aspects of company operations.

5. Economic conditions. Fuel shortages and related

conservation efforts are expected to provide continued growth in mobile radio communications, and overall company share of this market is not expected to decline.

6. Operating policies. The company plans to continue its existing policies to increase the sales of manufactured products, to achieve improved profit margins resulting from economies of scale and operating efficiencies, and to eliminate low profit margin operations at the expense of sales growth.

7. Estimated factors. The 1974 forecast is based upon assumed 47 per cent effective tax rate which reflects combined state and federal income taxes. Earnings per share in 1974 is based on 957,000 common shares which includes shares expected to be issued upon the exercise of outstanding common stock options.

These various assumptions involve the regulatory environment, general economic conditions, and industry growth which were expected to affect company operations in 1974. In addition, the assumptions describe company plans regarding continuity of existing corporate structure, operating policy to eliminate low profit margin operations, and computational estimates involved in the 1974 forecast.

It is recommended that a financial forecasting system should provide a means for users to estimate the effect of variations in major underlying assumptions. General information concerning cost-volume-profit relationships can provide users an ability to estimate the effects on earnings if forecasted sales growth does not occur. The forecast of Communications Industries, Inc., involves no sensitive market segments such as government contracts that are subject to continuing appropriations. In general, the firm estimates that a specified percentage of sales growth will provide two times that percentage in net income growth. This

\[\text{\cite{AICPA, Standards for Systems..., op. cit., pp. 27-28.}}\]
generalization, however, is not supported by actual cost behavior studies and is an overall guide for planning purposes.

INTERIM FORECAST REVISIONS

Publicly disclosed forecasts should be reviewed as actual operations occur so that revisions and updated forecasts can be issued when warranted. There are different opinions concerning the need to revise forecasts as actual results become known. One thought is to replace segments of the total forecast with results of actual operations as these latter amounts are determined. Quarterly reports of publicly owned companies would therefore present a summary of first quarter actual operations plus a forecast for the balance of the year. Another idea is to revise or amend the annual profit forecast only because of significant changes in assumptions or inaccuracies in related estimates.  

Two important aspects of forecasting are to provide users with futuristic information for evaluation in their specific decision areas and to subsequently examine the relative accuracy of such forecasts for purposes of establishing management credibility. It seems obvious that uncertainty is reduced as the forecast period approaches an end and that management should be able to develop more accurate estimates of total annual operations in the last half of a particular year. This point suggests that regular updating of forecasts which cover a fixed time period is an exercise which may provide little useful information.

Users of forecast information gain little value from accurate forecasts covering the last three to six months of a fiscal year. Accordingly,  

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it seems unnecessary to revise forecasts at interim dates unless the change is significant in nature. In reviewing operations, quarterly reports could be useful for asserting the continuing validity of an initial forecast and for commenting upon developments and conditions affecting the forecast.

During 1974, Communications Industries, Inc., issued quarterly reports for the three-month periods ending March 31, June 30, and September 30, 1974. There is no pronounced seasonal variation in the interim pattern of annual earnings as indicated by the analysis in Exhibit 5.3. As a general check on progress toward forecasted annual net income, it is possible to use the quarterly net income data to determine whether estimated annual results are reasonably achievable.

For example, first quarter actual profits of CI in 1974 were $330,000; based on 1973 data, such earnings should have then represented approximately 22 per cent of expected annual net income. After the first quarter, an estimate of 1974 net income would be $1,500,000 which is computed as $330,000/.22. Since the initial forecast was for profits of $1,427,000, there would be reasonable grounds at that time to assume that the forecast is still achievable. A similar analysis after the second quarter of 1974 would yield projected annual net income of $1,545,000 based on year-to-date 1974 profits of $680,000 as of June 30 and the 44 per cent year-to-date factor for 1973. As a general review, this analysis would have indicated no major problems in achieving the initial forecast.

Monthly budget reviews were performed by CI management during 1974, and a revision of the initial budget was completed after the second quarter. The revision is shown in Exhibit 5.4 which updates the initial forecast and also presents a summary of actual income statement results for
EXHIBIT 5.3

COMMUNICATIONS INDUSTRIES, INC.

QUARTERLY DISTRIBUTION OF ANNUAL NET INCOME FOR 1971-1974

(Dollar Amounts in Thousands)

<table>
<thead>
<tr>
<th>Year Ending December 31</th>
<th>First Quarter</th>
<th>Second Quarter</th>
<th>Third Quarter</th>
<th>Fourth Quarter</th>
</tr>
</thead>
<tbody>
<tr>
<td>1971: Net Income $453</td>
<td>$ 98</td>
<td>$110</td>
<td>$121</td>
<td>$124</td>
</tr>
<tr>
<td>Quarterly net income</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent of annual total</td>
<td>22%</td>
<td>24%</td>
<td>27%</td>
<td>27%</td>
</tr>
<tr>
<td>Percent of year-to-date</td>
<td>22%</td>
<td>46%</td>
<td>73%</td>
<td>100%</td>
</tr>
<tr>
<td>1972: Net Income $651</td>
<td>$133</td>
<td>$147</td>
<td>$165</td>
<td>$206</td>
</tr>
<tr>
<td>Quarterly net income</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent of annual total</td>
<td>20%</td>
<td>23%</td>
<td>26%</td>
<td>32%</td>
</tr>
<tr>
<td>Percent of year-to-date</td>
<td>20%</td>
<td>43%</td>
<td>68%</td>
<td>100%</td>
</tr>
<tr>
<td>1973: Net Income $1,145</td>
<td>$250</td>
<td>$255</td>
<td>$293</td>
<td>$347</td>
</tr>
<tr>
<td>Quarterly net income</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent of annual total</td>
<td>22%</td>
<td>22%</td>
<td>26%</td>
<td>30%</td>
</tr>
<tr>
<td>Percent of year-to-date</td>
<td>22%</td>
<td>44%</td>
<td>70%</td>
<td>100%</td>
</tr>
<tr>
<td>1974: Net Income $1,385</td>
<td>$330</td>
<td>$350</td>
<td>$363</td>
<td>$342</td>
</tr>
<tr>
<td>Quarterly net income</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent of annual total</td>
<td>24%</td>
<td>25%</td>
<td>26%</td>
<td>25%</td>
</tr>
<tr>
<td>Percent of year-to-date</td>
<td>24%</td>
<td>49%</td>
<td>75%</td>
<td>100%</td>
</tr>
</tbody>
</table>

EXHIBIT 5.4

COMMUNICATIONS INDUSTRIES, INC.

REVISED 1974 FORECAST COMPARED WITH ACTUAL RESULTS

(Dollar Amounts in Thousands)

<table>
<thead>
<tr>
<th></th>
<th>Initial Forecast</th>
<th>Interim Revision</th>
<th>Revised Forecast</th>
<th>1974 Actual</th>
<th>Ratio of Forecast to Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net sales</td>
<td>$15,876</td>
<td>$493</td>
<td>$16,369</td>
<td>$17,941</td>
<td>.91</td>
</tr>
<tr>
<td>Cost of sales and expenses</td>
<td>(13,184)</td>
<td>(571)</td>
<td>(13,755)</td>
<td>(15,267)</td>
<td>.90</td>
</tr>
<tr>
<td>Net operating income</td>
<td>$ 2,692</td>
<td>($78)</td>
<td>$ 2,614</td>
<td>$ 2,674</td>
<td>.98</td>
</tr>
<tr>
<td>Income taxes</td>
<td>(1,265)</td>
<td>36</td>
<td>(1,229)</td>
<td>(1,289)</td>
<td>.95</td>
</tr>
<tr>
<td>Net income</td>
<td>$ 1,427</td>
<td>($42)</td>
<td>$ 1,385</td>
<td>$ 1,385</td>
<td>1.00</td>
</tr>
<tr>
<td>Earnings per share</td>
<td>$ 1.49</td>
<td>$ 1.45</td>
<td>$ 1.45</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Revisions include the following factors:
(a) Increased sales volume in two subsidiaries.
(b) Discontinuance of a product line.
(c) Change estimate of common shares outstanding from 957,000 to 955,000.
the year. The revision was an adjustment to budgets for internal management use, but the adjustments are also included in this analysis as revisions of the simulated forecast. Two factors causing the revision were increased sales volume in two subsidiaries and discontinuance of a product line.

ANALYSIS OF FORECAST AND ACTUAL RESULTS

As indicated by the comparative results in Exhibit 5.4, the revised forecast represented 91 per cent of actual sales and 100 per cent of actual net income for 1974. Without considering the interim revision, the initial forecast represented 88 per cent of actual sales and 103 per cent of actual net income. Actual sales growth exceeded expectations, but the net income forecast was sufficiently accurate to serve the purposes for which such information would be presented to external users. In general, the forecasting experiment was successful from the corporate viewpoint of providing a forecast which was substantially achieved by actual results.

While an accurate forecast presents few problems for discussion and analysis, the comparative results in Exhibit 5.4 do involve certain factors requiring consideration. Net income in the revised forecast was a precise estimate of 1974 actual net income, but the ratio of net operating income to sales declined from 17 per cent in the initial forecast to 16 per cent in the revised forecast; this ratio then declined to 15 per cent in the actual income statement. Since actual sales were $1,600,000 over the revised forecast, the profit target was achieved with additional revenues that were offset by certain expenses which exceeded management estimates. In comparing actual results with forecasts, this type of variance needs to be analyzed and explained.
In its discussion and analysis of 1974 operations, CI management provided several reasons which explain the variances described above.

**Revenues.** Actual sales exceeded initial estimates because of an increase in physical volume of company-manufactured products. Price increases accounted for less than 10 per cent of the variation. Sales of manufactured products accounted for 54 per cent of 1974 sales whereas this source amounted to 49 per cent of total sales in the previous year.

**Gross profit.** In 1974, gross profit margins from manufacturing operations decreased from 32.3 per cent in 1973 to 31.7 per cent. This change was caused by increased material costs which occurred after the lifting of price controls. There was not a corresponding increase in company selling prices.

**Costs and expenses.** The effective income tax rate for 1974 was 48.2 per cent as compared with 47 per cent included in both initial and revised forecasts. The higher rate is attributed to increased business in states having corporate income taxes and increases in some state tax rates. Property taxes in 1974 were up $67,000 or 73 per cent over the prior year because of higher assessed valuations and tax rate increases.

Interest expense increased during 1974 because of increased short-term borrowing and additional long-term debt executed in 1974 at higher interest rates. The ratio of interest expense to the simple average of all notes payable was 7.5 per cent in 1973 and 9.9 per cent in 1974. In May, 1974, the company signed a new loan agreement with Prudential Insurance Company to replace the existing Prudential debt of $338,000 with a new 14-year note of $1,338,000 bearing a 9.15 per cent interest rate. Net proceeds of $1,000,000 were used to retire all short-term bank debt and to reduce a five-year revolving credit agreement with another bank.
Variances between actual and forecasted income statement components are adequately explained by the preceding factors. In general, this forecasting experiment demonstrated the ability of one firm to prepare an accurate forecast and to later explain differences between the forecast and actual results. Proposed standards for such accounting activities are discussed in the following chapter.

CHAPTER SUMMARY

By reporting upon the results of an actual forecasting experience for 1974, this research study has contributed to the experience base in forecasting which the accounting profession requires. Communications Industries, Inc., agreed to supply information essential to the study. The company developed a forecasted 1974 income statement for consolidated operations. The forecast was considered appropriate for public disclosure, although such disclosure was not made. Communications Industries, Inc., provides manufactured products and services to the land mobile communications market.

Company organization and its budgetary planning system were described to provide background information for the resulting forecast and its analysis. The initial forecast for net income of $1,427,000 was revised during the year to $1,385,000. Actual net income for the year was $1,385,000, but there were variances between actual and forecasted sales and expenses. These variations were adequately explained by management. Assumptions underlying the forecast were identified and described. In general, the forecasting experiment was a success from the corporate viewpoint of presenting a forecast which was achieved in all material respects.

In Chapter VI, certain results of this forecasting experiment are
used to develop proposed standards regarding the form and content of forecasts, specification of underlying assumptions, and evaluation of actual results. Standards are also proposed for audits of similar forecasts by independent certified public accountants.
CHAPTER VI

FORECAST REPORTING PRINCIPLES AND AUDITING STANDARDS

The usefulness and feasibility of published profit forecasts have been established by research results reported in the preceding chapters. This chapter considers the recommended content of such forecasts, methods of presenting forecasted information, and standards for attestation by independent CPAs. One objective of this study is to develop a tentative set of forecast audit standards governing the CPA's expression of an opinion concerning the reasonableness of corporate forecasting assumptions and methodology. In part, these standards are derived from and depend upon the form and content of published forecasts to be issued by corporate management. Recommendations concerning the form and content issues and other reporting principles precede any consideration of the CPA's association with forecasts.

This chapter proposes certain principles or standards regarding the form and content of published financial forecasts and develops suggested audit standards for attestation to such forecasts by independent CPAs. It is well recognized that the CPA cannot attest to the accuracy or achievability of a forecast. Audit standards involve the CPA's opinion regarding the reasonableness of forecasting assumptions and methodology. As general guides to practice, the audit standards suggest certain tests, review procedures, and documentation techniques that should be applied.
by auditors. Audit standards and procedures are formulated by reason and experience with reference to evidence obtained in the forecasting experiment with Communications Industries, Inc.

DEFINITION OF FORECAST

Since forecasts of future operations can vary according to managerial viewpoint and type of information presented, it is first necessary to establish an acceptable definition of the term forecast. The American Institute of CPAs (AICPA), the Accountants International Study Group (AISG), and the Securities and Exchange Commission (SEC) have all attempted to define the term forecast. Both the AICPA and the AISG distinguish between a forecast and similar terms such as projection and budget. The following definitions of the AICPA emphasize the essential distinctions.

A financial forecast for an enterprise is an estimate of the most probable financial position, results of operations and changes in financial position for one or more future periods. A financial projection for an enterprise is an estimate of financial results based on assumptions which are not necessarily the most likely. Budgets, plans, goals, and objectives may have some of the elements of targets or motivational hurdles. Budgets especially involve motivational, control, and performance evaluation considerations.

The SEC, however, did not distinguish between forecasts, projections, and related terms. A forecast was defined by the SEC as "a statement made by a company [including confirmations of an outsider's forecast] to outsiders regarding the company's anticipated future revenues, net income, or earnings per share whether expressed as a specific amount or as a range.

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This definition concentrates on anticipated future amounts and appears to be consistent with the concept of most probable financial results which is contained in the AICPA definition.

Management plans will usually involve goals, objectives, motivational, and behavioral considerations in budgeting. The meaning of forecast should be restricted, however, to an expression of most probable financial results since this is the information desired by external users. By limiting forecasts to estimates of most likely results, the possibility of extremely optimistic or conservative forecasts can be reduced.

Experience with publicly disclosed forecasts to date has involved only income statements and related earnings per share amounts. Forecasted net income is probably the most useful information to investors and should be considered the minimum disclosure required by any forecast. This study has concentrated on net income forecasts, and related audit standards developed in this chapter are likewise limited to the income statement. Forecasted balance sheets, cash flow information, and estimated changes in working capital may also provide useful information. As experience with forecasting improves, these financial statements may become common elements of forecast disclosure. The feasibility of such extended forecast disclosure and audits of these forecasts are beyond the purpose and scope of this study.

FORM AND CONTENT OF PUBLISHED FORECASTS

The form and content of a published financial forecast should comply with certain general criteria. To prevent inappropriate conclusions by

users, all disclosures must be clearly identified as a forecast. The title of pro forma financial statements should include the term forecast and otherwise describe the prospective nature of information being presented. The forecast should be concise enough to promote understandability, yet it should present enough income statement information so that analysis of profit margins and income growth rates can be performed by users. Other aspects requiring consideration are time period of the forecast, extent of detail, use of point or range estimates, and disclosure of assumptions.

BASIC FORM CONSIDERATIONS

A forecast of net income should be presented as a pro forma financial statement which discloses the operating results considered most probable by company management for a specified time period. Basic elements of form include the need to describe how the forecast was developed and the accounting principles utilized. If the forecast was developed by the budgetary system, then this system should be briefly described as to procedures employed, levels of management participation, and whether the resulting forecast has been adjusted to eliminate motivational and goal effects typically included in budgets. If the forecast was developed by an analytical model or other approach different from the processing of actual transactions, the method of development should be described. In terms of form, a forecast suitable for subsequent management accountability and comparison with actual results should include descriptive notes and narrative commentary.

The forecasted income statement should be based upon the accounting principles which will be applied to actual events and transactions. If the forecast is published separately from the corporate annual report, a
summary of significant accounting policies should be included in the forecast. If changes in accounting principles are expected to be implemented during the forecast period, the new principles should be used in preparing the forecast. In many cases, estimates will be used in preparing forecasts instead of applying detailed accounting procedures and pro forma recording of planned transactions. Estimated cost of goods sold based on gross profit margins is a common example. Estimates of this type are acceptable procedures and should be described if used in the forecast.

TIME PERIOD COVERED

If forecasts of net income are presented as pro forma income statements, it seems logical that the basic forecast period should correspond with a company's fiscal year. The annual time period orientation permits comparison with actual performance in prior years and subsequent analysis with current actual results. Forecasts could be presented for several time periods, but the level of uncertainty and possible inaccuracy increase as the number of forecast periods is expanded. The Accountants International Study Group concluded that published profit forecasts should "not extend beyond the end of the current financial year unless a substantial part of the year has elapsed, in which case it might extend to the end of the following year." This viewpoint was also adopted by the Securities and Exchange Commission.

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3 AICPA, op. cit., p. 5.
4 Accountants International Study Group, Published Profit Forecasts (Brooklyn, New York: Newport Press, Inc., 1974), paragraph 79.
The AICPA exposure draft regarding forecast disclosure does not recommend a specific time period to be covered by a forecast. It suggests that corporate management should review its forecasting ability and investor information needs in order to determine a reasonable time frame for published forecasts. A period of twelve months appears to be a reasonable limitation on published forecasts at the present time. Public disclosure should be timely and may precede the distribution of corporate annual reports.

As indicated in Chapter III, Fuqua Industries, Inc., published its profit forecasts and unaudited results for the prior year early during the forecast period. This practice seems desirable since annual reports may not be ready for distribution until two months after the close of a fiscal year. The recommended annual forecast period should not preclude general comments by management regarding potential growth in market share, sales, or profits that can be reasonably expected in future years.

EXTENT OF DETAILED INFORMATION

The amount of detailed information presented in a forecast determines the ability of users to understand and analyze the company's plans. There is an optimal level in presenting detailed information, since excessive details could confuse users and perhaps reveal facts that would aid company competitors. Peat, Marwick, Mitchell & Company has recommended that published forecasts contain all of the income statement captions typically found in corporate annual reports including operating income, other income and expenses, extraordinary items if reasonably predictable, and dual

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6AICPA, op. cit., p. 11.
presentation of earnings per share. The SEC requires minimum disclosure of sales, net income, and earnings per share.

Since it is desirable for users to understand and be able to analyze forecasts, the forecasted net income should disclose sales, cost of goods sold, other operating expenses, income taxes, and earnings per share amounts. It would also be desirable to present sales and estimated gross profits by product line as required with annual SEC filing. This sales mix and product line information is important in historical statements and is equally useful in forecasts.

The overall forecast should include an indication of how variations in total sales will affect net income. General profit-volume information of this type could be presented as part of management commentary concerning forecast assumptions. Since the sales volume estimate is a critical factor to forecast achievability, the profit-volume disclosure would enable users to assess the impact of failing to attain forecasted sales.

POINT OR RANGE ESTIMATES

In order to emphasize the inherent uncertainty of forecasts, many writers in this area advocate the use of interval estimates or ranges instead of single valued estimates for net income components. Two probabilistic methods of presenting forecast information have been discussed by Professor Dan Guy. The first method involves a three-level

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8 "SEC Proposes Rules on Forecasts," op. cit.

probabilistic income statement in which values for all data are shown for the most optimistic, most pessimistic, and most likely conditions. The second approach involves probability-tree financial statements. An expected value, standard deviation, and coefficient of variation are shown for each forecast item.

A range of values for forecasted amounts was supported by the position paper of Peat, Marwick, Mitchell & Company. Reasons for this position are that interval estimates will (1) emphasize the probabilistic nature of the forecast; (2) show that all amounts needed to determine net income are subject to variation; and (3) indicate the width of the ranges as related to the precision of the forecast.\(^{10}\)

The AICPA exposure draft on presentation of forecasts opposed the presentation of interval estimates. In general, the use of ranges could cause users to attribute

an unwarranted degree of reliability to the forecast ranges, because many users might assume (a) that a range represented the spread between the best possible result and the worst possible result, and (b) that the range was based on a scientifically determined interval. Management is in the best position to determine the single most probable result and this burden should not be placed on outsiders.\(^{11}\)

The AICPA document also noted the general requirement of using single point estimates in subsequent comparisons with actual results. Ranges were recommended as supplemental information to highlight the tentative nature of key factors such as sales and net income.\(^{12}\)

In evaluating these opposing viewpoints, it seems most desirable to

\(^{10}\)Cummings, op. cit., p. 6.

\(^{11}\)AICPA, op. cit., p. 6.

\(^{12}\)Ibid.
present a forecast which contains single valued estimates for the most probable results of operations. Point estimates for sales, net income, and other profit determining factors would be least confusing to users and easier for subsequent comparisons and analysis. The three-level statements present unnecessary information since actual results should be analyzed in comparison with the most likely forecasted results. Also, in defining a forecast, it was established that a forecast would consist of data expressing most probable financial results.

In general, the tentative nature and relative risk of achieving a forecast can be adequately communicated to users without presenting several forecasts. Supplemental ranges for sales, net income, and earnings per share could be beneficial to users. The profit-volume variation disclosure could easily satisfy this point by stating the effect on profits and earnings per share if actual sales exceed or fall below forecast by ten per cent or some other margin of error.

STATEMENT OF ASSUMPTIONS

There is general agreement that the principal assumptions upon which a forecast is based should be disclosed. Because of the numerous assumptions involved in any forecast, it is not practical to develop a standard list of items to be disclosed by every company. Assumptions by their very nature involve estimates concerning economic conditions, industry trends, regulatory actions by governmental agencies, realization of corporate plans, and specific computational estimates required to compile the forecast. Important assumptions are those which are critical to the achievability of the forecast. If forecasted profits depend upon the validity or accuracy of certain assumptions, then these matters should be disclosed.
Relative risk regarding the validity of assumptions is important and concerns assumed conditions that may not occur or predicted factors which are different from past experience. Assumptions of the following nature should be disclosed when they are subject to variation and when forecasted profits are sensitive to such variations:

1. Assumptions for which there is reasonable possibility of a variation which could significantly affect forecasted results;

2. Assumptions about expected conditions that are forecasted to be materially different from current conditions; and

3. Management plans, policies, estimates or other matters essential to an interpretation of the forecast.\(^{13}\)

The identification of important assumptions for disclosure is a difficult problem which must be resolved by management. Judgment and analysis are required to determine that assumptions are internally consistent, properly documented, and supported by reasonable evidence. Management cannot be held liable for honest and reasonable assumptions which ultimately prove to be inaccurate or invalid. Forecasts could perhaps be judged misleading if an important assumption was not disclosed and subsequently was the cause of forecasting inaccuracy.

Evidence to support assumptions may consist of trends based on actual past data, estimates prepared by independent consultants, and reference to currently prevailing conditions. Since disclosure of assumptions is a selective process, the forecasting system should be designed to identify and accumulate evidence for the various assumptions required to develop a profit forecast.

\(^{13}\)Ibid., p. 9.
REVISION AND EVALUATION OF FORECASTS

The preceding recommendations concerning form and content of profit forecasts indicated that a forecast of most probable income statement results for an annual period should be presented as a pro forma financial statement. Supporting commentary should describe the method of development, summarize underlying assumptions, and provide general guidelines for evaluating the effect of possible variations. Given a forecast prepared according to these guidelines, there still remain the practical issues of revising the forecast at interim dates and comparing forecasts with actual results. One problem which has become obvious with forecasting experience is the explanation of actual to forecast variations caused by changes in corporate structure. Acquiring or disposing of subsidiaries during the forecast period is a situation requiring forecast accountability standards.

REVISION OF FORECASTS

As actual operations occur during the year, publicly disclosed forecasts should be reviewed and revised if warranted. Income statement forecasts should be revised at interim dates primarily to reflect changes in assumptions or inaccuracies in related estimates. The purpose of a forecast is to provide users with futuristic information to resolve their particular economic decisions. Uncertainty is reduced as the forecast period approaches a close, and users are not provided with significant information by periodic forecast updates which are not material in amount.

Forecasts should not be revised at interim dates unless the change is significant in nature. This recommendation is particularly important because management should subsequently provide a comparison between actual results and the prevailing forecast. Management credibility in the
forecasting area is not promoted by a comparison between actual results and a revised forecast issued late in the forecast period. Unless a forecast is revised to reflect material changes in estimates of sales, expenses, or net income, regular quarterly reports by corporations during the forecast period should assert the continuing validity of the initial forecast. It is entirely appropriate for these quarterly reports to comment upon conditions and developments which affect the forecast.

Company management has the obligation to determine which conditions are sufficiently material to warrant forecast updating and to provide this information on a timely basis. The quarterly report is a convenient means for disclosing forecast revisions, but this method may not be suitable in all circumstances. A material revision determined in April of a forecast year probably should not be delayed until publication of second quarter results in July. Special reports may be necessary in some cases along with publication by financial new media.

If material changes in a forecast are known but cannot be quantified on a timely basis, corporate management should disclose the surrounding circumstances and withdraw the initial forecast pending its revision.14 This reporting obligation is comparable to the disclosures required when errors are discovered in previously issued financial statements. A similar obligation exists when the validity and reliability of a forecast is impaired. Major uncertainties may dictate the complete withdrawal of a forecast without issuing a revised version. The important point is that disclosure of changes in underlying conditions and business operations should not be delayed until actual results for the year are determined.

CHANGE IN CORPORATE STRUCTURE

A frequently occurring cause of forecasting inaccuracy compared with actual results is the acquisition or disposition of subsidiaries and other business segments during the forecast period. One assumption implicit in an initial forecast is the composition of the business entity and continuity of its various segments. This assumption should be explicitly addressed by management comments which indicate the presence or absence of known plans to acquire or dispose of business segments during the period.

When business segments are disposed of during the period, the initial forecast should be revised to reflect changes in all income statement components affected by the transaction. Since the segment was included in the initial forecast, the revision should be objectively determinable by reference to revenues and expenses of the segment included in the original forecast. The revised forecast should also reflect other changes of an indirect nature caused by eliminating the business segment. The guiding objective for this revision is to provide an amended forecast which will be comparable with actual results for the year. This comparison is an essential phase of the entire forecasting process and should be approached from the standpoint of holding management accountable for actual results related to a comparably adjusted forecast.

If a consolidated subsidiary or other segment is disposed of during the period, the initial forecast should be revised to eliminate the revenues and expenses of the subsidiary that would have applied to the forecast time period. Any gain or loss on the disposition should not be included in the actual results which are subsequently compared to the revised forecast. In most cases, this proposal means that forecasted net
income must be compared with income from continuing operations actually reported by the company for the year. While it is desirable to compare forecasted results with actual amounts reported in the income statement, it may be necessary in some cases to adjust actual results for purposes of this comparison. Modification of actual results may be required if the disposal of a segment does not qualify for "income from continuing operations" treatment under Opinion Number 30 of the Accounting Principles Board.15

When subsidiaries or other business segments are acquired during the forecast period, the initial forecast should be revised to include appropriate forecasts for the new segment. The basic principle for this revision is to develop a forecast which will be comparable with actual results for the forecast period. If a subsidiary is acquired in a purchase transaction, the forecast should be amended to include estimated revenues and expenses of the subsidiary for the post-acquisition part of the forecast period. If the acquisition is treated as a pooling of interests, the amended forecast should include estimated revenues and expenses of the new business segment for the entire forecast period.

To illustrate the recommended forecast revision, a business combination completed by Communication Industries, Inc., in 1973 is used as an example. The company began negotiations in 1972 to acquire the common stock of General Communications Services, Inc. The transaction was completed in August, 1973, by issuing 300,000 common shares of Communications Industries, Inc., and accounting for the combination as a pooling of...

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15 Accounting Principles Board, APB Opinion 30 - Reporting the Results of Operations (New York: American Institute of Certified Public Accountants, 1973), Section .08.
interests. Budgetary information provided by CI and actual operating results are used to indicate the recommended sequence of reporting events.\(^{16}\)

The initial forecast which could have been issued by CI in January, 1973, is shown in Exhibit 6.1. Amounts related to the pooled company are not included in the original forecast. After approval of the business combination by stockholders and completion of the pooling transaction, the revised forecast should have been issued in August, 1973. It would have been appropriate to disclose the pro forma effects of the business combination on the initial forecast in quarterly reports issued earlier in the year. This disclosure would have been appropriate since planning and completion of the transaction required several months. The revised forecast is comparable with actual results for the year as shown in Exhibit 6.1.

EVALUATION OF ACTUAL RESULTS

At the end of the forecast period, a comparative analysis of forecast and actual results should be required. This report should be presented on a timely basis and should generally not be delayed for a period of two months or more while the annual audit of actual results is being completed. Accordingly, the comparative analysis can normally utilize unaudited actual results for the year if audit adjustments in previous years were immaterial in the aggregate.

The forecast report should present the initial forecast, any revisions

\(^{16}\)Communications Industries, Inc., 1973 Form 10-K filed with the Securities and Exchange Commission (Dallas, Texas: Communications Industries, Inc., 1974), p. 22. Budget information was supplied by company management, but no formal forecast was publicly released in 1973. Certain assumptions were required in this study to measure operating results of the new segment, and these amounts are presented only for illustrative purposes.
### EXHIBIT 6.1

COMMUNICATIONS INDUSTRIES, INC.

REVISION OF 1973 FORECAST TO REFLECT BUSINESS COMBINATION

(Dollar Amounts in Thousands)

<table>
<thead>
<tr>
<th></th>
<th>(a) Initial Forecast</th>
<th>(b) Interim Revision</th>
<th>(c) Revised Forecast</th>
<th>1973 Actual</th>
<th>Ratio of Forecast to Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net sales</td>
<td>$10,721</td>
<td>$2,492</td>
<td>$13,213</td>
<td>$13,846</td>
<td>.95</td>
</tr>
<tr>
<td>Cost of sales and expenses</td>
<td><em>(9,339)</em></td>
<td><em>(2,069)</em></td>
<td><em>(11,408)</em></td>
<td><em>(11,705)</em></td>
<td>.97</td>
</tr>
<tr>
<td>Net operating income</td>
<td>$ 1,382</td>
<td>$   423</td>
<td>$ 1,805</td>
<td>$ 2,141</td>
<td>.84</td>
</tr>
<tr>
<td>Income taxes</td>
<td><em>(650)</em></td>
<td><em>(199)</em></td>
<td><em>(849)</em></td>
<td><em>(996)</em></td>
<td>.85</td>
</tr>
<tr>
<td>Net income</td>
<td>$  732</td>
<td>$  224</td>
<td>$  956</td>
<td>$ 1,145</td>
<td>.83</td>
</tr>
</tbody>
</table>

This exhibit is presented only for illustrative purposes. Amounts related to the pooled company were determined by its accounting for 18% of consolidated revenues and its 9% profit margin in pre-pooling financial statements.

(a) Original forecast prepared without including pooled company. Pooling transaction completed in August, 1973.

(b) Estimates of annual operating results for pooled company which should have been formulated in August, 1973, based on results to date plus remaining forecast period.

(c) Revised forecast is comparable with reporting of actual results and should have been issued in August, 1973.
implemented during the period, and a comparative analysis between revised forecast and actual income statement results. Variances between the revised forecast and actual results should be explained with sufficient detail and fact to be informative to users of this information. Differences between actual conditions, occurrences, quantitative factors, and related assumptions should be specified. Users need to be able to assess management forecasting abilities and the likelihood of reasonably accurate forecasts in the future. It is important for the forecast report to present all forecasting analyses for the year in a single document or report. In this way, a complete story is summarized in one document and the tendency to make misleading comparisons is reduced.

In comparing actual results with the revised forecast, numerical variances, various income statement percentages, and other ratios should be used by management as necessary to describe the relative accuracy of the forecast and causal factors for variations from actual amounts. Compensating differences should be explained individually if the amounts are significant. These differences could involve increased sales in one product line which were offset by reduced sales in another product line.

Formats used by individual firms in presenting their forecast reports will vary, but a minimum disclosure should include a summary of initial forecast, revised forecast, and actual results. Summary explanation of the reasons for revisions between initial and amended forecasts is necessary. Variances between revised forecast and actual results should then be analyzed. It is important to place these income statement amounts in a single schedule which can be inspected and evaluated without having to refer to numerous separate reports. Supporting schedules and explanations can then be referenced to the summary analysis. The complete forecast
report may require several pages, especially if there were two or more interim revisions or problems in achieving the forecast. The report is a critical factor in determining the confidence that external users will attribute to forecasting efforts by corporate management in the future.

SCOPE OF ATTESTATION BY CERTIFIED PUBLIC ACCOUNTANTS

The preceding recommendations concerning form and content of forecasts, updating procedures, and comparisons with attained results provide suggested standards and principles to guide forecast reporting practice. Many of these principles are applied by firms with actual forecasting experience and were observed or derived from the forecasting experiment with Communications Industries, Inc. These forecasting principles are similar to the accepted principles governing historical financial accounting in that they are capable of review and evaluation by independent third parties.

In performing a forecast audit, the independent CPA would review the forecasting system, examine the procedural aspects of developing the forecast, and determine that the form of presentation complied with accepted reporting principles. It would then be appropriate for the CPA to issue a report which indicates the scope of his responsibility, describes the procedures performed, and expresses an opinion concerning the reasonableness of forecasting methodology, underlying assumptions, and compliance with principles of forecast presentation and analysis.

In attesting to the fairness of historical financial statements, the auditor is not a guarantor whose examination can be relied upon to detect fraud or defalcation. In attesting to the fairness of a management forecast report, the auditor cannot assure the accuracy or achievability of the current forecast, and this limitation should be communicated clearly.
to all users of the forecast report. Suggested wording of the CPA's opinion and report on forecasts has been proposed by others and is beyond the scope of this research.17

This study has substantiated the feasibility of the auditor's association with forecasts. The simulated experience with Communications Industries, Inc., revealed no circumstances which would have prevented the association of independent auditors with the forecast. In addition, the following reasons support this recommended role extension for CPAs.

1. CPAs have the required skill to review a forecasting system and to analyze the reasonableness of pro forma financial statements produced by such systems;

2. CPAs are independent of company management and can lend credibility to management representations contained in a forecast; and

3. CPAs possess the necessary accounting expertise to evaluate computational procedures underlying a forecast and to determine whether the forecast is fairly presented in accordance with the principles recommended in this study.

A new professional group, Independent Projection Accountants, has been suggested by others for purposes of evaluating financial forecasts.18 This profession would include qualified personnel such as CPAs, budgetary analysts, internal auditors, and security analysts. At the present time, it seems unlikely that this professional group will become formally established. CPA firms already possess the required skills to perform audits of forecasts. Some CPA firms are reluctant to assert this ability


because of uncertain legal implications and lack of actual forecast auditing experience.

An important recommendation with regard to the CPA's attestation role was included in the recent SEC proposal on financial forecasts. The SEC indicated that CPAs who review or report upon forecasts will still be considered independent for purposes of auditing historical financial statements. According to the SEC proposal, the CPA's report on a forecast should include a statement as to the qualifications of the reviewers, their accounting and budgetary expertise, and their audit skills for determining objective evidence to support management assumptions.

The CPA firm conducting a forecast audit most likely has audit personnel who are familiar with the client's industry and business practices and management advisory service personnel who can evaluate forecasting and budgeting methodology. Principles of forecasting form and presentation have been suggested in this study and are being developed in practice. Reporting guidelines for the CPA's attest function have also been proposed by others. The remaining task is to develop standards for conducting the actual forecast audit.

AUDITING STANDARDS FOR FORECASTS

The audit of a forecast by an independent CPA is similar in many respects to the audit of historical financial statements. A forecast audit should involve a critical examination of forecasted financial statements to determine the fairness of presentation in accordance with certain

20Ibid.
recognized principles of presenting forecast information. These principles of presentation involve all the preceding recommendations under form and content of forecasts, updating, and comparison with actual results. The forecast is prepared by management which is primarily responsible for the representations it contains. The CPA is responsible for conducting a professional examination of this forecast and for expressing an opinion upon compliance of the forecast with certain principles.

Auditing procedures performed by the CPA must comply with certain recognized auditing standards. Generally accepted auditing standards have been extensively developed for purposes of auditing historical financial statements. Several of these standards should also apply to audits of forecasts, and other standards must be developed to recognize unique factors related to association of the CPA with forecasted financial statements.

The following standards are recommended guidelines to forecast auditing procedures and should govern the scope and quality of the audit examination. Proposed standards are presented under three classifications and are discussed briefly as to meaning and implications for auditing procedures.

QUALIFICATIONS OF AUDITOR

Three standards are proposed regarding the qualifications which the auditor should possess and the general approach to conducting his audit examinations.

Standard Q-1. The forecast audit will be conducted under the

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supervision of a person who is knowledgeable of the client's industry and business operations.

This requirement could be satisfied by persons having experience in historical audits, management advisory services to the company, or competent research concerning the client's industry and business operations.

Standard Q-2. The forecast audit will be performed by persons having adequate technical training and proficiency in financial accounting and forecasting aspects of managerial accounting.

In addition to familiarity with company business and industry conditions, the auditor must also understand budgeting, planning, and forecasting methodology. Since the auditor must evaluate the forecasting system and related procedures, proficiency in management accounting practice is suggested.

Standard Q-3. In all phases of the examination, the auditor will remain independent and exercise due professional care.

The auditor must be independent of company management in order to lend credibility to management forecasts. Due professional care is necessary because of the prospective nature of forecast information and higher relative risk that the forecast could prove to be misleading if not developed properly. The inclusion of "in all phases of the examination" is necessary in order to stress the importance of independence when the forecast-actual comparisons are made. There can be no appearance of forced actual results when the historical financial statements audit is performed.

EXAMINATION OF FORECASTS

Two general standards are recommended to guide the actual examination of financial forecasts and underlying systems and procedures.

Standard E-1. The auditor will review, evaluate, and document the forecasting system to determine its
reasonableness and extent of auditing procedures to be performed.

Since one phase of the auditor's opinion should cover the reasonableness of forecasting methodology, it is essential for the audit to include an extensive review of the forecasting system. The auditor should evaluate and document the planning system, reliability of previous forecasts or budgets, management approvals and employee participation, existence of goal setting instead of reasonable planning, and detailed estimation procedures employed. Subsequent auditing procedures will determine whether the forecast was prepared in accordance with the underlying system. The auditor must understand the forecasting system and be satisfied that it can produce reasonable forecasts.

**Standard E-2.** The auditor will accumulate sufficient, competent, evidential matter regarding the bases of forecast preparation.

To comply with this standard, the auditor must determine that the forecast was developed in accordance with the system designed by management. Evidential matter regarding this compliance is accumulated for evaluation by the auditor to support his opinion on the forecast. Documentation includes evidence for the important assumptions, estimation procedures, and calculations which constitute the forecast.

Assumptions should be explained by management as an integral part of the forecasting system. The auditor's function is to evaluate the reasonableness of these assumptions, to determine that the forecast was prepared in accordance with the assumptions, and to ascertain that the assumptions are internally consistent throughout the forecast. The auditor's examination should also determine whether the forecast report presented by management complies with the body of general principles recommended for such reports.
REPORTS BY INDEPENDENT AUDITORS

The auditor's opinion should accompany the presentation of forecasted financial information by management. The forecast report developed by management should include a description of forecasting procedures, forecasted income statement for the subsequent fiscal year, statement of assumptions underlying the forecast, comparison of actual results for the current year against related forecast, and suitable explanation of variances.

The forecast report in this format would be an annual presentation which complies with recommendations presented earlier in this chapter. Since principles for such forecasting reports are not generally recognized at present, the basic principles for form and content should be summarized in the report in a manner similar to the accounting policies which are disclosed in historical financial statements.

The forecast report would be presented by management and should contain the opinion or report of the independent auditor. The following standards should be observed by the auditor in preparing his report.

**Standard R-1.** The report will describe the auditor's role and association with the forecast and extent of responsibility which he assumes.

**Standard R-2.** The report will indicate whether the current financial forecast conforms with procedures and assumptions described by management.

**Standard R-3.** The report will express an opinion concerning the reasonableness of forecasting procedures and assumptions underlying the current forecast and the reasonableness of management explanations concerning attainment of the prior year forecast.

**Standard R-4.** The opinion will indicate whether the entire forecast report presented by management is in accordance with principles for such presentations as they are summarized in the report.

The exact wording of the auditor's report remains to be formulated.
and requires additional testing, analysis, and experimentation. Any opinion on management forecasts must indicate that the forecast constitutes representations by management which are approved and authorized by the corporate Board of Directors. The tentative nature of forecast information must be emphasized so that external users are not misled.

Auditing standards recommended in this study are based on existing auditing standards and reference to the nature of forecast disclosures by management. Auditing procedures that have been suggested for the forecast examination are presented in Appendix D.

Audits of forecasts and attestation by CPAs are relatively new developments. Reporting upon forecasts at this time requires education of the user group and rather extensive explanations by the auditor. The forecasting principles and reporting standards recommended in this chapter are designed to provide an overall framework for this type of attest function.

CHAPTER SUMMARY

Forecast reporting principles are similar to generally accepted accounting principles which govern measurement and reporting practices in historical financial statements. Forecast reporting principles have not been authoritatively defined by the accounting profession at this time, although such principles will be required if forecasting becomes a widespread practice. Forecast reporting principles are concerned with the form and content of published forecasts, time period covered, extent of detailed information presented, use of point or range estimates, disclosure of assumptions, updating procedures, and comparison of forecasts with actual results.

Forecast reporting principles recommended in this study are based
upon careful analysis of professional literature, a simulated forecast experience, and judgment regarding what constitutes useful practice. A forecast of net income should be presented as a pro forma financial statement which discloses the operating results considered most probable by management for the ensuing fiscal year. Public disclosure of forecast information should be timely and may precede the distribution of traditional corporate annual reports. Since it is desirable for users to understand and be able to analyze forecasts, the forecasted income statement should disclose sales, cost of goods sold, operating expenses, income taxes, and earnings per share. Supplementary data for sales and gross profits by product lines are also desirable.

General statements about how variations in total sales will affect net income should be included in the forecast. Forecasted elements of net income should be presented as single valued estimates, although range or interval estimates for sales and net income would be useful information. The forecast should include comments by management on how the forecast was developed and the principal assumptions involved. Assumptions should be described if they are subject to variation and if forecasted profits are sensitive to such variations. Forecasts should be reviewed regularly, but revisions should be implemented at interim dates only to reflect changes in assumptions, inaccuracies in estimates, or changes in the corporate structure.

At the end of a forecast period, management should provide a timely report which compares actual performance with the revised forecast and explains material variations. A complete forecast accountability report should summarize the initial forecast, any revisions implemented during the period, and the comparative analysis with actual results.
The forecast audit should involve a critical examination of forecasted financial statements to determine their reasonableness and fairness of presentation in conformity with reporting principles such as those recommended in this study. A forecast audit should be similar to historical audits except that financial information is prospective in nature and forecast reporting principles have not been previously defined or generally accepted by the accounting profession. Auditing procedures performed by the CPA must comply with certain general standards. These standards govern the scope and quality of auditing procedures.

Based on existing auditing standards and the nature of forecasts, nine auditing standards were recommended for qualifications of auditors, examinations of forecasts, and reports by independent auditors. Given adequate professional competence, the auditor must review the forecasting system to determine its reasonableness and extent of auditing procedures to be performed. The auditor must then accumulate sufficient evidence regarding the bases of forecast preparation. The auditor's opinion should concern reasonableness of the forecasting methodology, underlying assumptions, and presentation of information in accordance with reporting principles which are described in the forecast accountability report issued by management.
CHAPTER VII

SUMMARY AND CONCLUSIONS

A comprehensive study of the environment of published financial forecasts and the CPA's involvement with such forecasts was presented in the preceding six chapters. Published technical literature was the foundation from which this investigation began; such literature established forecasts as relevant information to users of financial statements and presented current attitudes about the environment surrounding published forecasts. The published forecasts of Fuqua Industries, Inc., were analyzed for reporting practices and disclosures in order to determine items of form and content which deserved consideration.

A financial planning model, the Delphi XX developed by Arthur Young & Company, was used to examine the possibility of using computer models to generate forecasts for companies without extensive internal budgeting capability. Communications Industries, Inc. (CI) of Dallas, Texas, provided input for use with the Delphi model and also served as the basis for an empirical forecast experiment. CI provided a 1974 forecast which was, in management opinion, suitable for public disclosure, although actual publication was not made. Comparisons of the forecast with actual results were analyzed in order to address the issues of assumptions, technical problems, and variance analysis. This experiment served as an addition to the experience base which is lacking in relation to published forecasts.
After analyzing professional literature, current practice, and the forecasting experiment, several reporting principles for published forecasts were recommended as guides to future practice. The recommended principles were described and supported by reasons of their need and importance. A final issue of concern was the independent accountant's possible involvement with published forecasts. At the current time, the CPA is not, under the Code of Professional Ethics, allowed to vouch for the achievability of a forecast. It should not be necessary to change this standard since achievability could never be guaranteed. The possibility of CPA attestation to reasonableness of assumptions, forecasting methodology, and mathematical calculations is feasible, and general auditing standards for this function were recommended. Development of the forecast reporting principles and auditing standards concluded the study. The following discussion summarizes each section of the research effort and presents major conclusions and recommendations.

SUMMARY AND REVIEW

After discussing the purpose of this study and research methods in Chapter I, the objectives of financial statements and viewpoints of interested groups about published forecasts were summarized in Chapter II to define the current forecast environment. Chapter III examined this environment more closely by discussing recent developments in SEC policies, United Kingdom forecasting practice, and the specific experience of a United States firm with published forecasts. The history of forecasting and possible usefulness of computerized forecasting models were analyzed in Chapter IV, and the details of an empirical forecast experiment were described in Chapter V. Chapter VI proposed forecast reporting principles and general standards for auditing financial forecasts. Each chapter
is summarized in the following discussion.

OBJECTIVES AND RESEARCH METHODS

Users of financial statements have become increasingly concerned with data concerning the future. Forecast data are not currently published to any great extent, and independent accountants are not publicly involved with forecast data which are published. Since 1973, when the Securities and Exchange Commission revoked its ban on projections in SEC-filed documents, published forecasts have become an important topic in technical literature.

Some of the major issues in forecasting include relevance of forecasts to users, credibility problems of future data, forecasting procedures, and involvement of certified public accountants with published forecasts. After establishing the premise that forecasts are relevant to users, the major concerns of this thesis involved forecast development, a forecasting experience base, forecast reporting principles, and related audit standards.

Research objectives and limitations. Based upon the issues which appeared to be most critical in the published forecast area, the following research objectives were formulated:

1. To investigate the usefulness of a computerized forecasting model as a supplement to or substitute for budgetary projections.

2. To provide the accounting profession with insight regarding the experience base necessary for auditing corporate financial forecasts.

3. To develop recommended forecast reporting principles and forecast auditing standards supporting the CPA's expression of an opinion on the reasonableness of corporate forecasting methodology.

One limitation of the study was that data for only one company was
analyzed with a computer-based planning model, the Delphi XX. The purpose of this analysis was not to demonstrate the widespread applicability of the model, but to determine the potential feasibility of using this type of model for forecasting purposes. Analysis of forecast data in this study was limited to the income statement. The current base of experience with published forecasts is concerned primarily with the income statement, and this information appears to be of most interest to users.

Finally, specific forms of forecast audit reports which could be issued by CPAs and detailed auditing procedures were not included in the study. It is more critical at this time to determine forecast reporting principles and standards by which a forecast audit would be conducted. Form of the CPA's opinion on forecasted financial statements and related auditing procedures have been recommended in other studies.

Research methods. The design and completion of this study relied on several research methods. A literature survey was necessary to establish the need for published financial forecasts. Secondary research materials are listed in the bibliography.

To investigate the usefulness of computerized forecasting models, the Delphi XX model was used to simulate net income for Communications Industries, Inc., from 1969 through 1973. The generated profit forecasts were compared with actual profits to determine the relative accuracy and usefulness of the model. Regression analysis was applied to past budget data of the company to determine relative predictability of revenues, operating expenses, and income before taxes.

A simulated forecast experience was conducted with the participation of Communications Industries, Inc. The company management provided a profit forecast for 1974 which was considered suitable for public
disclosure, although disclosure was not made. Actual results were monitored throughout the year; problem areas, factors not anticipated, and changes in forecast assumptions were documented. The actual income statement for 1974 was compared with the forecast to highlight significant variances which would have warranted explanation in public disclosure. This empirical forecast experiment added to the experience base which must be established in the area of published forecasts.

Recommended forecast reporting principles and a set of forecast auditing standards were developed. The reporting principles were based in part upon literature survey and analysis of Fuqua Industries published forecasts and annual financial statements. The auditing standards were formulated by reason, analysis of traditional auditing standards, and experience gained from the experiment with Communications Industries.

THE FORECASTING ENVIRONMENT

Various groups associated with financial forecasts have made statements concerning the merits and limitations of published forecasts. These groups include financial statement users, forecast preparers, and independent accountants. Recent attempts to formulate the objectives of financial statements provide relevant information concerning the issue of whether forecasts should be considered for publication in conjunction with traditional financial statements.

Objectives of financial statements. To be issued separately or in conjunction with other financial statements, published forecasts should fulfill some purpose. Many studies have outlined financial statement objectives, and a recent attempt was completed by the Study Group of the American Institute of CPAs. The general conclusion of this group was
that financial statements should provide information which is useful for making decisions.¹

The Study Group stated that financial forecasts should be published if they will help users in making reliable predictions.² Prior to this study, the Accounting Principles Board Statement Number 4 had indicated that an objective of financial statements is to provide information that is helpful in estimating the earnings potential of a company.³ It appears that users of financial statements should be the ones to decide whether published financial forecasts satisfy their information and decision making needs.

User viewpoint. The general view held by users toward published forecasts is positive. Users of financial statements have been surveyed many times about published forecasts and about the information which users consider relevant. In a recent survey, financial statement users listed the following six factors as important information needs: future economic outlook of the company; quality of management; future economic outlook of the industry; expected future growth in sales; financial strength of the company; and expected future percentage growth in earnings per share.⁴


²Ibid., p. 46.


In addition to the opinion that forecast information is useful, users feel that there is unequal distribution of forecast information. Some companies disclose projections to security analysts who distribute this information selectively to their clients. The Securities and Exchange Commission has tried to correct this situation through its ruling that any forecast disclosure by companies or confirmations of outsiders' forecasts must be filed with the SEC to be available for public use.\(^5\)

Studies have determined that financial statement users have a short-range outlook in decision making and that publication of one-year forecasts would not change this perspective. Users generally feel that corporate managements have the ability to forecast within an acceptable degree of accuracy as indicated by opinion survey results. Finally, the majority of investment transactions involve institutional investors which have the necessary training to understand and use forecasts properly.

**Corporate viewpoint.** The overall corporate consensus is against published financial forecasts. The major reason cited for this negative attitude is fear of legal liability because of a forecast which is not achieved. The SEC has tried to minimize that concern by its proposed "safe harbor" provision; companies would not be subject to liability if forecasts have been prepared with care based on reasonable assumptions.

Competitor advantage and cost of publication are two additional reasons underlying the prevailing corporate viewpoint. Managers often feel that published forecasts will disclose information which will benefit competitors. The costs under consideration are those of developing the

initial forecast each year and for publishing and updating this information. Costs of publishing and updating could be minimized by the possible inclusion of forecasts with traditional financial statements.

Other reasons which explain the lack of corporate participation in voluntary forecast disclosure include anticipated reluctance to issue forecasts when a decline in profits is expected, the problem of companies which might consistently issue optimistic or pessimistic forecasts, and uncertainty caused by unstable economic conditions. These reasons and perceived problems are not sufficient to prevent forecast publication. The SEC has stated that discontinuance of forecast publication requires a filing of reasons; stockholders would be suspect of companies which had no substantial reason for discontinuance. Statement users would learn to adjust forecasts for consistent patterns of inaccuracy; legal liability for intentional misstatement would also act as a deterrent to unrealistic forecasts. Changes in economic conditions can be recognized in forecast updates.

**Accounting viewpoint.** The public accounting profession has an interest in forecast publication since accountants may be called upon to attest to forecasts and because users may feel that CPAs have some responsibility if forecasts are published in conjunction with traditional financial statements. Many of the national public accounting firms have expressed definite positions on involvement with forecasts.

Attesting to forecasts and performing some type of forecast audit are the potential functions of independent accountants. There are many arguments against attestation including the contention that CPAs lack competence in evaluating forecasting techniques. A more realistic assessment is that CPAs have not had to evaluate forecasting systems in
performing the typical audit of historical financial statements. Another argument against attestation is that auditors are unable to evaluate or change management assumptions. Assumptions require judgment in financial accounting which the auditor is qualified to exercise. If management and auditors disagree on important assumptions, the accountant can withdraw from the engagement. In all cases, forecasting assumptions are a management responsibility, and this fact should be clearly noted in any forecast disclosure.

There are currently no auditing standards which apply solely to forecasts or any generally accepted principles to guide the presentation of forecast information by management. Such standards and principles can be developed. Independence of CPAs in their traditional audit role could also be undermined. The SEC does not concur that association with forecasts impairs independence, since the Commission now allows the review and reporting on forecasts by CPAs. The potential legal liability of the independent accountant may be substantial, and this fact more than any other explains the reluctance of CPAs to become associated with forecasts. The final argument is that users may believe the CPA's opinion to be a guarantee of forecast results; this naive point of view can be prevented by disclosure and user education.

Arguments in favor of attestation cite the need of qualified persons to examine forecasts and lend credibility to management representations. In the United Kingdom, the experience of Chartered Accountants with forecasts has been extremely favorable. The accounting profession in the United States has always recognized its obligation to serve the public. If attestation to forecasts will serve the public need, the accounting profession must accept this role or allow others to perform the attest
function. Public demand, a favorable legal environment, and willingness by CPAs are factors that will determine whether independent accountants extend the attest function to forecasts.

FORECAST DISCLOSURE

Budgetary disclosure has not developed rapidly in the United States. It was only in 1973 that the Securities and Exchange Commission began allowing forecasts to be published in SEC-filed documents. The major source of futuristic information has been and continues to be security analysts. The lack of published forecasts in this country is in contrast to forecasting practice which has developed in the United Kingdom.

Forecasts by security analysts. Security analysts have been the major source of forecast information because they have had access to data and client demand to make this task worthwhile. Companies either gave an analyst a forecast prepared by management or provided the analyst with sufficient information to prepare a forecast. There are no authoritative guidelines or controls over the preparation of forecasts by security analysts. Each analyst is free to make his own assumptions, and disclosure of these assumptions is not required.

SEC regulations. Over a period of years, the Securities and Exchange Commission has modified its negative position on published forecasts. The Commission currently allows voluntary publication of earnings projections in SEC-filed documents by those companies which meet the definition of a reporting company. The SEC defines a reporting company as one which has been an Exchange Act company for a reasonable period of time and which has a history of internal budgeting.6

6Ibid., p. 248.
The SEC has tried to minimize the fear of legal liability by its proposed safe harbor provision. This provision defines the circumstances which would produce the greatest likelihood of a reasonable projection. If these conditions are satisfied, a forecast would not considered a misleading statement of a material fact if the forecast were not achieved. This position has been upheld in the case of Beecher versus Able.

**Case of Fuqua Industries.** Fuqua Industries, Inc., was the most publicized firm to begin issuing forecasts under the 1973 SEC ruling. The company published forecasts for 1973 and 1974 in documents separate from its annual reports to stockholders. The firm's auditors, Ernst & Ernst, were not publicly associated with the forecasts in either year. The company decided to cease forecast publication in 1974.

Forecast to actual comparisons were made for both years by the firm. It is basically in this area that certain unacceptable practices were observed. During the year 1973, the original forecast was revised. The three documents of principal concern, original forecast, revised forecast, and actual results, were never presented or analyzed together. Different line items of income were emphasized in the different documents.

Major criticism is directed toward the form of comparing actual with forecasted results. No line by line income statement adjustments were shown between the original and revised forecasts in order to summarize the nature of revisions that were made. Forecasted and actual earnings

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per share figures were compared in a misleading way. The comparison was between earnings per share in the original forecast and earning per share based on income from continuing operations in the actual income statement for 1973. Since the original forecast had been restated for purposes of all other comparisons, the earnings per share amounts definitely were not comparable. Finally, there was no specific variance explanation provided by management. There were comments throughout the 1973 annual report which could have explained some variances between forecasted and actual operations. The inadequate forecast reporting principles observed in this case served as the basis for several recommendations in this study.

**United Kingdom forecasts.** In the United Kingdom, forecasts are not allowed to be included in annual reports, but forecast information is required in prospectuses and is considered desirable in takeover circulars. The Chartered Accountants are involved with the allowed publication of forecasts. In a prospectus, the Chartered Accountant does not attest to the forecast, but must consent to the publication of his opinion on prior years' profits and net assets in the context that the opinion appears in the prospectus. The accountant would not consent to publication if there were reservations concerning the forecast contained in the same document. If a forecast is published in a takeover circular, the accountant must report on the forecast with respect to reasonableness of accounting bases and calculations. The forecasts are clearly described as the sole responsibility of management.

**FORECASTING MODELS**

Forecasting may be accomplished through simple projection of past performance, complex computer models, or any number of methods between
these two extremes. Models are abstract representations of systems, processes, and relationships among controllable and uncontrollable variables. Forecasting models should be validated regarding realism and accuracy of output. A computer model could possibly serve as a substitute for a large internal budgeting staff is the model could generate reasonably accurate output.

**History of forecasting.** Even before the computer era, forecasts and projections were prepared by business firms. These forecasts were the result of rather simple, uncomplicated models of the business and its economic environment. Models have been used to forecast sales and to predict cost behavior. The comprehensive profit plan or budget was the first forecasting application to consider all aspects of company operations. Budgets were developed by manual processing of estimated transaction data in a manner that duplicated the historical accounting system.

With the advent of computers, more complex models could be developed to recognize the interaction of many input variables. These computer models would supposedly produce better forecasts because of their abilities to deal with large volumes of data and complex relationships. Computer models for forecasting purposes have not been used to the fullest extent, however, because of developmental cost considerations, preferences for older and more understandable budgeting techniques, resistance to change by managers, and problems of excessive information generated by some models.

**Models and validation.** Forecasting models require assumptions and inputs concerning general business conditions, industry conditions, and corporate plans. The precision of model output will be directly related to the validity of model structure, basic assumptions, and accuracy of
Input data. A model is validated to determine its ability to produce accurate results. In validation, the ability of a model to predict is measured by comparing model outputs with historical results or with actual results which occur in future periods.

**Delphi XX model.** The Delphi XX is a financial planning model which relies upon financial statement structure, ratio analysis, and trend extrapolation. The model was developed by Arthur Young & Company. Fifty-two inputs are allowed, although not all of these elements are necessary to operate the model. The essential inputs for income statement simulation are estimated sales and the ratio of cost of goods sold to sales. The Delphi XX produces forecasted balance sheets, income statements, financial analyses, and ratios for a five-year period. This information could be used to evaluate the effects of alternative plans, such as changes in product mix, introduction of new products, economic changes, and potential corporate acquisitions. Another possible use of the model is to provide short-run planning capability for companies without extensive internal budgeting activities.

**Case of Communications Industries.** Communications Industries (CI) provides products and services to the land mobile industry. Sales for 1974 totaled $17.9 million and net income was $1.4 million. The publicly held company has never had an unprofitable year, but its revenues and net income are not readily predictable using a linear growth trend.

To test the usefulness of the Delphi XX or a similar model, the period 1968-1973 was selected for experimentation. The first phase was to determine whether the model could duplicate actual income statement amounts for 1968-1972 when estimation and forecasting were not involved. Model output corresponded almost exactly with actual amounts for the
five-year period, and this phase of model validation was considered successful.

The model was then tested for its ability to generate reasonably accurate forecasts. Historical validation was applied to test this point, and Delphi XX was used to forecast actual income statements of CI for 1969-1973. This simulation required the assumption that company management could accurately estimate future sales, plant and equipment additions, and fixed labor, overhead, selling and administrative costs. Actual inputs were used for the assumed factors in conjunction with financial statement ratios developed from the immediately preceding year. For the years 1970-1972, the model generated forecasts that corresponded reasonably well with actual income statements. There were large variances between actual and simulated results in 1969 and 1973 because of explainable factors.

Based on this limited validation experiment, there is reasonable evidence that computer forecasting models could be used to supplement detailed budgetary projections developed by conventional procedures. Such models can produce useful forecasts if management estimates of sales and fixed expenses are accurate and if financial statement relationships remain fairly stable over time.

AN EMPIRICAL FORECAST EXPERIENCE

A frequent problem cited in conjunction with published forecasts is that company managements and certified public accountants lack the required experience with forecasting to assess the potential problems involved. This experience is gained only by practice and experimentation. Communications Industries, Inc., of Dallas, Texas, agreed to participate in a simulated forecasting experiment in order to contribute to the
necessary experience base in forecasting. This phase of the study is called an experiment or a simulation because the forecast developed by the company was not publicly disclosed.

**Communications Industries organization.** CI is part of the rapidly growing land mobile industry which is presently estimated at $600 million per year in total sales. The company began as a partnership in 1946 to introduce mobile radio communications to isolated drilling operations. As the company expanded, there were two public stock offerings. CI consists of operating divisions and four wholly owned subsidiaries, including two manufacturing operations, two service companies, and a parts distributor.

The company does not try to compete with the giants in its industry such as Motorola and General Electric. Instead, CI cultivates these companies as customers for the peripheral equipment which it produces. The land mobile communications industry is growing rapidly, but CI manages to avoid much competition by directing its emphasis toward original equipment manufacturers and users with complex communications installations.

**Budgetary planning system.** Communications Industries has more than ten years of experience with budgeting and annual profit planning procedures. The budgeting system concentrates on income statement items and cash flows. Pro forma balance sheets are not developed. Sales budgets are reviewed by top management and approved by company officials who will be responsible for achieving actual results.

Cost of goods sold for manufactured items is based on standard cost information. Manufacturing overhead costs and administrative expenses are traced on a line-item basis to company segments incurring these costs. The tendency for managers to overestimate expenses and to underestimate
revenues is being eliminated so that the profit planning system will produce realistic and achievable goals for an annual period.

**Forecast of 1974 operations.** The initial forecast prepared by Communications Industries was obtained in January, 1974. The forecast did not require special adjustments since the internal budget was considered reasonably attainable and suitable for disclosure to external users. The forecast was expressed in a format similar to a highly condensed conventional income statement. Product line forecasts are also prepared but were not included in the study.

The condensed pro forma income statement met the standards proposed by the Forecasting Task Force of the American Institute of CPAs. The forecast was based on the single most probable results of operations and was approved by company management. The accounting principles which would be used to record actual transactions during the year were used in preparing the forecast, which was adequately documented as to bases and calculations.

**Forecast assumptions and revisions.** Management prepares a forecast based on assumptions about events, conditions, and circumstances that will most likely prevail or occur during the forecast period. All assumptions should be supported by reasonable evidence. Because of the numerous assumptions involved in any forecast, it is not feasible to develop a standard list of items to be disclosed for every company.

In preparing the initial forecast of CI for 1974, assumptions were

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not specifically documented by the company in a formal fashion for purposes of listing in this study. The following assumptions were identified by analysis of prior year operations and discussion with the company controller. The forecast assumed continuity of the existing corporate structure; normal raw material supplies and delivery schedules were assumed. It was expected that labor and material costs would increase. Economic conditions affecting areas of customer demand and regulatory policies of the Federal Communication Commission were expected to provide continued short-run and long-run sales growth.

During 1974, monthly forecast reviews were performed by CI management, and a revision to the original forecast was made after the second quarter. This revision was caused by increased sales volume in two subsidiaries and discontinuance of a product line. In general, revisions in forecasts should not be made for the sole purpose of correcting forecasted amounts to actual amounts as the forecast period progresses. The CI forecast revision was timely and acceptable in this respect.

Forecast-actual analysis. A comparison of the revised forecast and actual results for 1974 showed that the forecast represented 91 per cent of actual sales and 100 per cent of actual net income. Actual sales growth exceeded expectations, but the forecast would have been sufficiently accurate to serve external users' needs. In general, the forecasting experiment was successful from the corporate viewpoint of providing a forecast which was substantially achieved by actual results.

In preparing the forecast reporting principles recommended in this study, consideration was given to several factors involved in the simulated forecasting experiment with CI. While forecasted net income was a precise estimate of 1974 actual net income, the profit target was
achieved with additional revenues that were offset by additional unexpected expenses. In comparing forecasts with actual results, this type of compensating difference needs to be disclosed and explained.

Communications Industries management was helpful in providing explanations of variances between forecasted and actual income statements. Explanation of variances included factors such as increased physical sales volume, increased material costs caused by the removal of price controls, underestimation of the effective income tax rate, and increased interest due to higher interest rates. This experiment demonstrated the ability of one firm to prepare an accurate forecast and to explain differences between the forecast and actual results at the end of the forecast period.

REPORTING PRINCIPLES AND AUDITING STANDARDS

Forecast reporting principles are similar to generally accepted accounting principles which govern the measurement and reporting practices in historical financial statements. A forecast audit should involve a critical examination of the forecast to determine its reasonableness and fairness of presentation in conformity with forecast reporting principles. Auditing procedures for forecasts should comply with certain general standards governing the scope and quality of forecast audits.

*Forecast definition.* Projections of future operations can be prepared for purposes other than forecasts of recurring operations. It is necessary to establish a uniform definition of the term forecast when used in reference to published financial forecasts intended to be issued on a recurring basis. The American Institute of CPAs has developed the most useful definition of a financial forecast which is "an estimate of the most probable financial position, results of operations, and changes
in financial position for one or more future periods."

**Form and content of forecasts.** Forecast reporting principles are concerned with the form and content of published forecasts, time period covered, extent of detailed information provided, use of point or range estimates, disclosure of assumptions, updating procedures, and comparisons of forecasts with actual results. The principles recommended in this study were based upon careful analysis of professional literature, analysis of the forecasting policies of Fuqua Industries, a simulated forecast experience, and judgment regarding the usefulness of certain reporting practices.

A forecast of net income should be clearly identified as a pro forma statement which discloses the most probable expected operating results for the ensuing fiscal year. The disclosure should be timely and may precede the distribution of traditional annual reports. Line items which should be disclosed include sales, cost of goods sold, operating expenses, income taxes, and earnings per share. It would be desirable to include supplementary data for sales and gross profits by product line.

Information regarding general profit-volume relationships should be presented so that the sensitivity of profits to operating variations is determinable. Forecasted elements of net income should be shown as single valued estimates, although potential ranges of sales and net income would be useful information. Management remarks should be included on forecast development procedures and principal underlying assumptions.

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Revision and evaluation. Revisions should be made at interim dates only to reflect material changes in assumptions, inaccuracies in estimates, or changes in the corporate structure. A timely report should be issued at the end of the forecast period which compares the original forecast, updated forecasts, and actual results. This forecast report should explain material variations between actual results and the revised forecast. Explanations should be provided for revisions at the time these changes are implemented.

Users need to be able to assess management forecasting abilities and the likelihood of obtaining reasonably accurate forecasts in the future. It is important for the forecast report to present all forecasting analyses in a single document. Formats used by individual firms in presenting this forecast accountability report will vary as will the level of detail in variance explanations. Sufficient information should be provided to enable users to understand material differences between actual and forecasted results and to establish the credibility of management reporting practices.

Scope of attestation of CPAs. In performing a forecast audit, the CPA would review the forecasting system, examine the procedures for developing the forecast, and determine that the form of presentation complied with accepted forecast reporting principles. An audit by CPAs would not assure the accuracy or achievability of a management forecast. The forecast audit should be designed to evaluate the reasonableness of forecasting methodology, related assumptions, and presentation of forecast information by management.

Forecast auditing standards. Generally accepted auditing standards have been adopted by the public accounting profession for auditing
historical financial statements. Several of these standards should also apply to audits of financial forecasts, but additional standards must be developed to recognize the unique nature of forecasted financial statements.

Nine auditing standards were recommended for qualifications of auditors, examinations of forecasts, and reports by independent auditors. Given adequate professional competence, the auditor must review the forecasting system to determine its reasonableness and the extent of auditing procedures to be performed. Sufficient evidence must be accumulated regarding the underlying assumptions of the forecast. The auditor's opinion should concern the reasonableness of forecasting methodology, bases of preparation, and compliance with principles of forecast presentation and analysis.

CONCLUSIONS AND EVALUATION

General conclusions and recommendations derived from the analyses in previous chapters are enumerated below. Recommendations apply primarily to presentation of published financial forecasts and auditing standards for such projections. Discussion of potential areas for additional research concludes the study.

GENERAL CONCLUSIONS

A survey of professional literature, analysis of published forecasts by one company, a forecasting experiment, and judgment were used to form conclusions related to the three objectives established at the beginning of this study.

One objective was to investigate the usefulness of computerized forecasting models as a substitute for or supplement to detailed budgetary
projections. Based on the use of the Delphi XX model, it was found that such computer models may be acceptable as a supplement to detailed budgetary projections. Computer-based models can produce useful forecasts if management estimates of sales and fixed expenses are accurate and if financial statement relationships are relatively constant over time. Since several budgetary estimates are required input for forecasting purposes, these models could not be a total substitute for other forms of internal budgeting.

The second objective was to provide the accounting profession with insight regarding the experience base necessary for auditing corporate financial forecasts. This objective was accomplished through the participation of Communications Industries, Inc., in a simulated forecasting experience which demonstrated the feasibility of forecasting and permitted the examination of problems and issues involved. The company provided a reasonably accurate income statement forecast for 1974 and explanations of variances between the forecast and actual results.

The third objective was to develop suggested income statement forecast reporting principles and related auditing standards. The recommended forecast reporting principles are listed below and should be observed by management in preparing and presenting forecast information.

1. A forecast should be presented as a pro forma financial statement which discloses operating results considered most probable by management.

2. The forecasted income statement should be based upon the accounting principles which will be applied to actual events and transactions. A summary of significant accounting policies and forecast reporting principles should be included in the forecast.

3. The forecast should be presented on a timely basis to cover the ensuing fiscal year.

4. The forecast should disclose sales, cost of goods sold,
selling and administrative expenses, income taxes, net income, and earnings per share.

5. The elements of the forecasted income statement should be presented as single valued estimates.

6. Assumptions which are critical to the achievability of the forecast should be disclosed.

7. Forecasts should be reviewed periodically during the forecast period and revised on a timely basis to reflect material changes in assumptions, inaccuracies in estimates, or changes in corporate structure.

8. A comparative analysis between original forecast, revised forecasts (if any), and actual results should be presented in a single document at the close of the forecast period. Variances should be explained with sufficient detail to be informative and to establish the credibility of management reporting practices.

Forecast auditing standards should establish the scope of a forecast audit, the general nature of procedures to be performed, and factors to be considered in the CPA's expression of an opinion on the reasonableness of corporate forecasting methodology. Nine general auditing standards were recommended dealing with the qualifications of auditors, examination of forecasts, and auditor's report.

Standard Q-1. The forecast audit will be conducted under the supervision of a person who is knowledgeable of the client's industry and business operations.

Standard Q-2. The forecast audit will be performed by persons having adequate technical training and proficiency in financial accounting and forecasting aspects of managerial accounting.

Standard Q-3. In all phases of the examination, the auditor will remain independent and exercise due professional care.

Standard E-1. The auditor will review, evaluate, and document the forecasting system to determine its reasonableness and extent of auditing procedures to be performed.

Standard E-2. The auditor will accumulate sufficient, competent evidential matter regarding the bases of forecast preparation.

Standard R-1. The report will describe the auditor's role
and association with the forecast and extent of responsibility which he assumes.

**Standard R-2.** The report will indicate whether the current financial forecast conforms with procedures and assumptions described by management.

**Standard R-3.** The report will express an opinion concerning the reasonableness of forecasting procedures and assumptions underlying the current forecast and the reasonableness of management explanations concerning attainment of the prior year forecast.

**Standard R-4.** The opinion will indicate whether the entire forecast report presented by management is in accordance with principles for such presentations as they are summarized in the report.

**AREAS FOR ADDITIONAL RESEARCH**

Additional research in the area of published financial forecasts should investigate the potential legal liability of independent accountants in expressing opinions on financial forecasts. The possible disclosure of forecasted balance sheets, cash flow statements, and statements of changes in financial position could be examined as to usefulness and feasibility. Detailed auditing procedures, similar to the techniques summarized in Appendix D, should be devised to implement and comply with the auditing standards ultimately adopted by the public accounting profession.
APPENDIX A

MAJOR FORECASTS REQUIRED IN

SUN OIL COMPANY MODEL
### Treasury Department

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<thead>
<tr>
<th>Sale of Securities</th>
<th>Dividend Rate</th>
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<tr>
<td>Treasury Stock Purchases or Sales</td>
<td>New Long Term Debt</td>
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<tr>
<td>Price Earnings Ratio</td>
<td>Interest Rate on Debt</td>
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<td>Debt Repayment Schedule</td>
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### Production Department

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<th>Lease Bonus Investment</th>
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<tr>
<td>Natural Gas Price</td>
<td>Producing Property Investment</td>
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<tr>
<td>Crude Production from Acquired Properties</td>
<td>Gas Plant and Facility Investment</td>
</tr>
<tr>
<td>Non-Associated Gas Production</td>
<td>Drilling Cost per Well</td>
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<tr>
<td>Gas Plant Revenue</td>
<td>Gas Oil Ratio</td>
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<tr>
<td>Miscellaneous Operating Revenue</td>
<td>Depreciation Rate</td>
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<tr>
<td>Development Expense</td>
<td>Retirement Rate</td>
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<td>Abandonment Expense</td>
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### Manufacturing Department

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<th>Pipeline Allowances</th>
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<td>Cost of Chemicals and Catalyst</td>
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<td>Refinery Purchases</td>
<td>Maintenance Expense</td>
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<td>Branch Purchases</td>
<td>Manufacturing Overhead</td>
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<td>Pipeline Overdeliveries</td>
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<td>Yield Gain</td>
<td>Plant Investment</td>
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<td>Fuel Burned</td>
<td>Depreciation Rate</td>
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<td>Company Use - Branches</td>
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### Crude Supply Department

| Imported Crude | Inventory Change |
| Domestical Crude | |

### Transportation Department

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<th>Operating Costs</th>
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<td>Foreign Flag Charter Rates</td>
<td>Days in Service</td>
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<tr>
<td>Number of Ships</td>
<td>Depreciation Rate</td>
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</tbody>
</table>

### Tax Department

| Tax Rate | Investment Credit |
| Statutory Depletion Rate | Taxes Other than Income Tax |
| Schedule M Adjustments | |
Marketing Department

Product Prices
Product Volumes
Gasoline Sales by Channel of Distribution
New Stations Opened
New Stations Leased
Stations Lost

Volume per Station
Investment per Station
Advertising Expense
Rehabilitation Expense
Bulk Plant Investment
Auto and Truck Investment
Depreciation Rate

Subsidiaries and Affiliates

Operating Income
Dividends
Sale of Capital Assets
Sale of Securities
Miscellaneous Income

Cash Expenses
Non-Cash Charges
Foreign Taxes
Capital Expenditures
Minority Interest

APPENDIX B

DELPHI XX DATA BASE FOR INCOME

STATEMENT VALIDATION, 1968-1972
**COMPANY NAME:** Communications Industries, Inc.

**DATA FILE NAME:** /CI-ACTUAL/

**ABBREVIATED COMPANY NAME:** COMM IND

This is the name which will appear on your Delphi produced statements. Eighteen characters are available. If you use less than 18, center the characters used on the spaces above.

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<td>(Use 2 digits in response; e.g., normally all five years would be required, so the answer would be 20.)</td>
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### RAW MATERIALS INVENTORY - OPENING

What is the opening balance of Raw Materials Inventory? 470. A06

### RAW MATERIALS INVENTORY

What are the ratios of Raw Material Inventory to Total Inventory?
### FINISHED GOODS INVENTORY - OPENING

What is the opening balance of Finished Goods Inventory?

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<tr>
<th>Question</th>
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What are the ratios of Finished Goods Inventory to Total Inventory?

(The values for questions 7 and 9 must add to 1.00)

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What are the ratios of Total Inventory to the next Quarter's Gross Sales?

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What are the values for Investments in Other Assets?

(e.g., if there is $2 million in Other Investment, enter 2000.)

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### Paid-In Surplus

**Question 32**

What are the values for the Paid-In Surplus Account?
(Quarterly Figure)

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### Retained Earnings - Opening

**Question 33**

What is the opening balance of Retained Earnings?
(Do not include paid-in surplus.)

| Value | 1306.1 |

### Sales

### Gross Sales Per Quarter

**Question 34**

What are the values for Gross Sales per quarter? Up to 21 quarters.
(Be sure to enter at least a value for the first quarter.)

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<td>3461.0</td>
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### Growth Rate - QT Gross Sales

**Question 35**

What are the values for the quarterly growth rate for Gross Sales?
(Even if you have entered the expected Gross Sales figures for every period in Question 34 above, you must enter a zero for the first quarter here.)

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### Sales Discount

What are the ratios for Sales Discounts and Refunds to Gross Sales?

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### Cost of Sales and Expenses

#### Fixed Direct Labor

What are the values for Fixed Direct Labor Cost per Quarter?

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#### Variable Direct Labor

What are the ratios of Variable Direct Labor to Cost of Goods Produced?

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#### Fixed Overhead

What are the values for the Fixed Component of Overhead Cost per Quarter?

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#### Variable Overhead

What are the ratios of Variable Overhead to Cost of Goods Produced?

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<td><strong>COST OF GOODS SOLD</strong></td>
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<td>What are the ratios of Cost of Goods Sold to Net Sales?</td>
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<td>17 692</td>
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<td><strong>QUARTERLY DEPRECIATION RATES</strong></td>
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<td></td>
<td>What are the Average Quarterly Depreciation Rates as a percent of Gross Plant and Equipment? (The rates must be quarterly since depreciation is calculated quarterly and totaled to obtain annual figures.)</td>
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<td><strong>43</strong></td>
<td><strong>FIXED ADMINISTRATIVE EXPENSES</strong></td>
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<td>What are the values for Fixed Administrative Expenses per Quarter?</td>
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<td>01 285</td>
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<td><strong>VARIABLE ADMINISTRATIVE EXPENSES</strong></td>
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<td>What are the ratios of Variable Administrative Expenses per Quarter to Net Sales?</td>
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<td><strong>45</strong></td>
<td><strong>FIXED SELLING EXPENSE</strong></td>
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<td>What are the values for Fixed Selling Expenses per Quarter?</td>
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What are the ratios of Variable Selling Expenses to Net Sales?

| **QUARTERLY INTEREST RATES ON DEBT** | 01 | A47 | 01 | 01 |
| | | | | 02 |
| | | | | 03 |
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| | | | | 05 |
| | | | | 06 |
| | | | | 07 |
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What are the values for the average interest rates on debt? (Quarterly rates.)

| **REDUCTION IN INTEREST EXPENSE DUE TO CONVERSION** | 01 | A48 | 01 | 0 |
| | | | | 02 |
| | | | | 03 |
| | | | | 04 |
| | | | | 05 |
| | | | | 06 |
| | | | | 07 |
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What are the values for the Reduction in Interest Expense if all conversion privileges into Common Stock are exercised? (In thousands of dollars.)

| **EXTRAORDINARY GAINS** | 01 | A49 | 01 | 0 |
| | | | | 02 |
| | | | | 03 |
| | | | | 04 |
| | | | | 05 |
| | | | | 06 |
| | | | | 07 |
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What are the values for the Extraordinary Gains Account? (Quarterly figures. The amount will apply to all periods unless input is a zero value for a subsequent period.)
### EXTRAORDINARY LOSSES

What are the values for the Extraordinary Losses Account?

(Quarterly figures. The amount will apply to all periods unless input is a zero value for a subsequent period.)

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### AVERAGE ANNUAL TAX RATE

What are the Average Tax Rates?

(This rate is an exception; it should be on an annual basis; e.g., .50)

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### P/E MULTIPLE-COMMON

What are the multiples for the ratio of Assumed Common Stock Market Price to Earnings Per Share?

(Annual Value)

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APPENDIX C

REQUIRED CHANGES IN DELPHI XX DATA BASE FOR

INCOME STATEMENT FORECASTS, 1969-1973
The Delphi XX data base shown in Appendix B was used for income statement validation of Communications Industries, Inc., for 1968-1972. The following data base changes were required before applying the Delphi model to forecast income statements for 1969-1973 as described in Chapter IV. The following revisions relate to specific input questions contained in Appendix B and indicate the input values used in the 1969-1973 forecasts.

A06. Raw Materials Inventory - Opening 780.
A08. Finished Goods Inventory - Opening 692.
A10. Total Inventory
     01  .788  05  .876
     09  .756  13  .687
     17  .581
A12. Gross Plant & Equipment
     01  1541.  04  1679.
     08  1800.  12  1597.
     16  1692.
A33. Retained Earnings - Opening 1447.
A34. Gross Sales Per Quarter
     01  1866.  05  1827.
     09  2047.  13  2406.
     17  3461.  21  3461.
A37. Fixed Direct Labor
     01  410.  05  391.
     09  426.  13  516.
     17  702.
A39. Fixed Overhead
     01  410.  05  391.
     09  426.  13  516.
     17  702.
A43. Fixed Administrative Expenses
     01  335.  05  328.
     09  374.  13  416.
     17  573.
A49. Extraordinary Gains
     01  0.0  17  0.0
APPENDIX D

COMPOSITE AUDIT PROGRAM FOR PROFIT
AND WORKING CAPITAL FORECASTS
I. Preliminary Review
A. Nature of business. Establish the general nature of the company's activities, its main products, markets, customers, suppliers, divisions, locations, labor force, and trend of results.
B. Relative risk. Consider whether any matters, prima facie, might create difficulties.
   1. Business activities which are difficult to forecast.
   2. Unreliable costing and accounting methods.
   3. Inadequate forecasting methods.
C. Overall materiality. Identify any aspects of the business which are of particular importance to the ultimate achievement of the forecast.
   1. An activity which is large in relation to the business as a whole.
   2. Major limiting factor. Isolate the most important limiting factor governing the level of profits forecast by the company, such as sales potential, production capacity, or availability of financing.
   3. Unusual operating conditions affecting the business to a material extent.

II. Accounting Principles
A. Obtain a statement of the accounting principles and methods adopted by the company.
B. Consider whether any accounting principles:
   1. Have not been applied consistently during the year under review.
   2. Are not normally acceptable.
   3. Differ from those used by other parties in any takeover or merger.
C. Ensure that the published documents disclose the effect of any change in principle during the period under review.

III. Accounting System
A. Obtain copies of:
   1. A manual of accounting procedures or a description of methods used in preparing the company's financial and management accounts.
   2. A reconciliation of the last published audited accounts with the management accounts for the same period.
   3. The supporting working papers.
B. Review the methods used to determine the principal items of income and expense, assets and liabilities to establish whether:
1. The methods can be relied upon to produce accurate accounts.
2. There are inconsistencies in the methods used to prepare financial and management accounts which might affect their comparability.

C. Particular attention should be paid to the practices adopted for the following items:
1. Costing of inventory.
2. Provision for inventory obsolescence.
3. Recognition of revenues for long-term contracts.
4. Treatment of intercompany profits.
5. Capitalization of research and development costs.
6. Depreciation of fixed assets.
7. Provision for bad debts.
8. Recognition of revenues or other income, particularly goods on consignment and sale or return.
10. Cost of pension plan, including past service cost.
11. Treatment and disclosure of extraordinary items.

IV. Forecasting System
A. Method of preparation:
1. Obtain from the company statements of:
   a. Procedures used when preparing forecasts for management purposes. (Documentation by the company of the preparation of the forecasts is of particular importance. The company should maintain records of the arithmetical construction of forecasts, the reasoning adopted, and the assumptions made.)
   b. If different, the procedures used in preparing the forecasts under review. (If forecasting is a normal company procedure and not an ad hoc exercise, the established basis of preparation can be examined and relied upon.)
2. Determine that the forecast represents management's best estimates of the results it reasonably expects to be achieved as distinct from targets which management has set as desirable.
3. Ascertain the persons responsible for preparing the forecasts.
   a. Is each functional section prepared by or under the guidance of the executive in charge of the department?
   b. Are all senior executives involved and is there adequate consultation for coordination?
4. Determine that the established procedures are followed in practice.
5. Consider the adequacy of the procedures followed and their appropriateness for the business.

B. Reliability of previous forecasts:
1. Compare the budgets, management accounts and financial accounts for the last two financial years.
2. Investigate material variances between the budgeted and actual results.
3. Consider the company's practices in revising and updating forecasts.

V. Examination of Profit Forecasts
   A. Obtain from the company:
      1. The forecasts in the form in which they are to be published.
      2. The assumptions on which they are based.
      3. The supporting detailed forecasts and assumptions.
      4. Published interim statements, if available, for the completed part of the period under review.

   B. Evaluate the assumptions to determine the sources of information and the anticipated changes including the support for those changes and whether based on internal or external sources. In particular, the following should be considered:
      1. Volume of sales.
      2. Price level of sales.
      3. Productive capacity.
      4. Levels of cost.
      5. Availability of working capital.
      6. Any special features peculiar to the business.

   C. Compare the forecast with any earlier forecast for the same period and obtain explanations for any material changes.

   D. Compare the results shown by the most recent management accounts with the budget for the same period.

   E. If the forecast results differed materially in the past from the actual results achieved, inquire whether any alterations have been made to the forecasting procedures which should help to reduce future differences.

   F. Consider the higher relative risk associated with the following circumstances:
      1. Businesses where sales levels or profit margins are especially difficult to predict.
      2. New or unproven products or processes.
      3. Dependence on a few large outlets or sources of supply.
      4. Long-term contracts at fixed prices.
      5. Long-term credit arrangements.
      6. Reorganization or disposition plans.

   G. Discuss the forecasts and assumptions with the senior executives of each major subsidiary or division to establish that all relevant factors have been considered and that the views of all managers have been coordinated.

   H. Obtain letters of representation from the senior executives confirming their opinion that the forecasts are properly compiled and are attainable.

VI. Examination of Cash Flow Forecast
   A. Obtain from the company:
      1. A cash flow statement for a period not less than that covered by the profit forecast.
         a. The review should extend beyond the period reported on to assure that payments due soon after the end of the period are covered.
         b. The statement should be prepared on a monthly or quarterly basis so that seasonal fluctuations are shown.
2. A forecast balance sheet at the end of the review period and at any interim periods if available.

B. Compare the present cash flow forecast with any earlier forecast for the same period and obtain explanations for any material changes.

C. Compare on a test basis the actual receipts and payments for the last three years with the budgeted cash flow statements for the same period.

D. Review the detailed forecasts prepared by subsidiaries or divisions to determine that:
   1. The assumptions used for the cash flow forecast are the same as those used for the profit forecast.
   2. The changes in level of inventories, debtors and creditors appear reasonable for the budgeted level of activity.
   3. Planned capital expenditures and other major disbursements and receipts are included in the correct period.
   4. The forecast balance sheet reconciles with the forecast level of profit.

E. Obtain written confirmation from bankers and other loan creditors for the overdraft and loan facilities assumed to be available during the period of the forecast. If material, obtain advice from the company's financial advisers as to the likely course of interest rates during the period of review.

VII. Consolidation of Forecasts
A. Check that the forecasts of subsidiaries or divisions which have been the subject of detailed examination have been correctly included in the consolidated forecast.

B. Test the arithmetical accuracy of the consolidation working papers.

C. Determine that the forecast has been properly adjusted for intergroup or interdivisional transactions, unrealized profits and, if applicable, minority interests.

D. Review the consolidated forecast and assumptions in conjunction with the assumptions on which the subsidiary forecasts are based to establish that:
   1. The assumptions on a consolidated basis are consistent with the detailed assumptions.
   2. The consolidated forecast appears reasonable on the basis of the overall assumptions.

VIII. Approval by Board
Ensure that the profits and cash flow forecasts together with the assumptions on which they are based are formally approved by the Board.
BIBLIOGRAPHY

Books


Articles and Periodicals


Publications of the Government, Learned Societies and Other Organizations


Other Sources


VITA

Cecily Anne Raiborn was born October 30, 1949, in Tokyo, Japan. She received her Bachelors of Science in accounting and her Masters in Business Administration from Louisiana State University in 1971 and 1973, respectively. She then entered the doctoral program in accounting at L.S.U.

While in residence, she received a teaching assistantship and was the accountant for the Cerebral Palsy Association in Baton Rouge. After completing her coursework, she taught for one year at Texas Christian University in Fort Worth and is currently an Assistant Professor at the University of Texas at Arlington.
EXAMINATION AND THESIS REPORT

Candidate: Cecily Anne Raiborn

Major Field: Accounting

Title of Thesis:
Empirical Forecasting Experience and
Formulation of Related Audit Standards

Approved:

[Signature]
Major Professor and Chairman

[Signature]
Dean of the Graduate School

EXAMINING COMMITTEE:

[Signature]
[Signature]
[Signature]

Date of Examination:

November 21, 1975