FORECAST DISCLOSURE OF EARNINGS:  
AN EMPIRICAL STUDY OF THE EFFECTS ON  
MANAGERIAL BEHAVIOR

DISSERTATION

Presented in Partial Fulfillment of the Requirements for  
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By


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1974
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CHAPTER I

INTRODUCTION

The Problem to be Investigated

During the past several years there has been a heightened interest in the United States into the question of whether or not corporate financial forecasts should be publicly reported. According to one source,¹ the first proposal for forecast disclosure was introduced in 1947 at the annual meeting of the American Institute of Certified Public Accountants:

In the government, it is the custom to publish budgets but not the final result of operations. In private accounting, the custom is the reverse. I should like to see business firms undertake to publish their budgets as well as financial statements because (1) it will give valuable information to shareholders and enable them to judge the planning ability of their managers, and (2) provide valuable information on business plans and business operations...for economists and statisticians.

American interest in this topic appears to have been revived, in part, by the adoption by the United Kingdom in 1968 of the practice of providing earnings forecasts in prospectuses for the issue of capital and in

circulars for mergers and take-overs.\textsuperscript{2} Interest in this topic has also been stimulated by the search for improved disclosure of accounting information.

In the United States, corporate financial forecast presentations have been quite varied. Such disclosures have ranged from specific accounting numbers to very general statements outlining management's expectations of future firm profitability; and, both the quantity and quality of the information provided varies along this spectrum. With respect to the method of disclosure, one study\textsuperscript{3} of seventy U.S. companies found that approximately one-third of those surveyed publicly disclosed some type of forecast; slightly less than one-third neither publicly nor privately divulged any forecast information at all; and slightly more than one-third privately advised financial analysts on the accuracy of their forecasts.

The apparent dissemination of forecasted information only to selected financial analysts prompted a Security and Exchange Commission investigation in late 1972.\textsuperscript{4} Those hearings resulted in a reversal of the Commission's traditional ban on the publication of earnings forecasts.

In brief, the SEC concluded that it would not require public disclosure of forecasts by any company but (1) companies that meet certain standards as to a history of earnings and internal budgeting would be permitted to include forecasts of at least sales and net income in SEC filings,


\textsuperscript{3}Morton Backer, "Reporting Profit Expectations," Management Accounting, February 1972, p. 34.

and (2) any company that elects to disclose forecasts would be required to file such projections with the SEC.  

But the SEC's new position does little to remove the variation in the methods of disclosure or in the forecasts themselves.

The failure of the SEC, and the AICPA, to seek more radical changes in existing forecast disclosure practices in the U.S., possibly along the lines of the current British standards, reflects perhaps a hesitancy to proceed into areas about which so little is known. In some areas, for example with respect to the accuracy of company forecasts, the British experience has provided some insight into the potentialities of corporate financial forecast disclosure; however, there is a lack of empirically-based knowledge regarding most areas of forecast disclosure. For example, nothing is known about the effect of such public disclosures of corporate information on the behavior of the management in the firms disclosing their forecasts. Such questions as "Does management alter its internal decision policies or strategies in an effort to fulfill the prophesized or forecasted result?" and "Are accounting methods manipulated to achieve equality between forecasted and reported accounting numbers?" remain largely unanswered. In many of the previous investigations into

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6Rule 2-04 of the AICPA Code of Professional Ethics states: "a member or associate shall not permit his name to be used in connection with any forecast of the results of future transactions in a manner which may lead to the belief that the member or associate vouches for the accuracy of the forecast."


8See references 5, 6, 7, 11, and 22 in the Selected Bibliography.
forecast disclosure where the topic of managerial behavior has been considered, it is suggested that the effect of forecast disclosure might well be dysfunctional; however, empirical evidence does not exist to confirm or reject such a hypothesis.

Therefore, this investigation will attempt to generate empirical evidence concerning the question of what is the effect of public disclosure of corporate financial forecasts on managerial behavior in the forecast disclosing firms.

The Scope of the Study

This investigation is delimited in several ways. It is, first of all, exploratory and seeks not to test an existing theory of managerial behavior, but rather to determine if certain systematic behavioral functions are present which themselves may suggest a theory of management behavior. It is also empirical, and not rigorously theoretical. This study attempts to describe previous managerial behavior, and not to prescribe it. This study will not attempt to ascertain whether the resulting managerial behavior, should any be observed, is or is not dysfunctional from either a firm or owner standpoint; such questions can best be handled in another research study.

Although corporate financial forecasting ranges from entire budgeted financial statements to a single accounting number, this study will consider only managerial behavior in response to the publication of a firm's future earnings number. And while earnings forecasts may be published in connection with company press reports, quarterly and annual financial data releases, prospectuses for the issue of capital, circulars for
mergers or take-over attempts, or simply by themselves, this study will be concerned only with earnings forecasts as published in prospectuses for the issue of capital. In as much as data of this nature is available solely from firms listed on the United Kingdom stock exchange system, this study will examine data from firms in England, Wales, Scotland, Ireland, South Africa, and Australia.

The problem to be investigated may now be restated as: to examine the effect of earnings forecast disclosure, as presented in prospectuses for the issue of capital, on managerial behavior in firms listed on the United Kingdom stock exchange system.

**The Need for the Research**

The premise of this investigation is the view that the disclosure of earnings forecasts may be desirable from the standpoint of investors, creditors, or other concerned third parties. Such a view presumes that the social cost of providing such forecasted information is minimal, zero, or at least less than the benefits to be obtained by the recipients of the forecast. But this social cost assumption is an unresolved question. It is not now known whether the summation of the utility and disutility of forecast disclosure is positive or negative. This preliminary investigation will attempt to describe managerial behavior under the disclosure situation; combining this work with other research evaluating the

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9 According to Cooper, Dopuch, and Keller, forecasted data may be beneficial to investors because such data provides "some foreknowledge of a firm's future cash flows and of the elements of both planning and chance which have conditioned their composition." (p. 641).
functionality of that behavior, will eventually allow some determination to be made regarding the utility of forecast disclosure from the standpoint of the firm and its owners.

A Model of Anticipated Behavioral Responses
Managerial Forecast Behavior

From the forecasting literature a model of anticipated managerial responses to the forecast disclosure situation can be structured (see Figure 1). The model is admittedly over-simplified with respect to the decision processes that are undertaken by management in determining the actual forecast of operations and in determining the behavior that will be followed by management subsequent to the forecast disclosure. In fact, for the purposes of this model, the actual managerial decision points, boxes five and nine of Figure 1, are treated as "black boxes," i.e., having little relevance to the purpose of this study. Nonetheless, Figure 1 does capture the behavioral considerations that are relevant to this investigation.

Intuitively, a managerial forecast of operations is a function of at least three factors (boxes one through three): environmental assumptions, past performance, and aspiration levels. These factors are present at both the individual and organizational levels. For example, one may refer to the past performance of the individual manager as well as to the past performance of the organization as a whole; similarly, the aspiration level of the individual may or may not coincide with the goal of the larger organization. The first of these factors, environmental assumptions, is rather broad, encompassing such things as assumptions concerning the availability of raw materials, the stability of price levels and the stability of currency exchange rates, as well as assumptions concerning
FIGURE 1. A Model of Anticipated Behavioral Responses to the Forecast Disclosure Situation
the growth of product or service demand. Together these three factors, and possibly others depending upon the individual manager and his method of forecasting, serve as inputs to a managerial decision (box five) regarding the forecast of future operations. This managerial decision could be presumed to result in a realistic forecast unless other considerations mediate the forecast specification process.

It has previously been suggested\(^\text{10}\) that such mediating considerations (box four) do exist and that they can be attributed to the forecast disclosure situation.

One such mediating consideration may be management's desire to avoid lawsuits. Given that the forecasted information would likely become a primary consideration influencing a user's investment decision, subsequent failure of actual results to equal forecasted levels might be accompanied by investor-sponsored legal action charging misrepresentation or fraud. Such proceedings could be stimulated either when investor losses suffered when forecasts prove over-optimistic and subsequently the share price falls,\(^\text{11}\) or when previous stockholders are unable to share in the gains that may accompany conservative forecasts due to the fact that they had sold their investment in order to engage in more promising ones. A recent (1971) court decision, however, may somewhat mollify this point.

\(^{10}\)See references 7, 8, 11, and 28.

\(^{11}\)A share market theory is not proposed in this study; however, certain statements in this investigation may suggest results contrary to the Efficient Market Theory. In most cases, those results represent the expectations of management as reported in other sources. This study is an attempt to examine management's behavior and expectations, assuming that propositions by management, regardless of their consistency with market efficiency, are worthy of investigation.
A suit brought against Monsanto Chemical Company for damages based in part upon erroneous forecasts resulted in a decision that "corporations may not assume significant risks when forecasts are issued in good faith, the methods of preparation are conscientious, and there is prompt disclosure of changes in the forecasts." This consideration is further diluted by the fact that "in general, a lesser propensity to litigate exists in the U.K." 

Perhaps a more significant consideration might be management's desire to avoid confrontation with or criticism from current and previous investors, financial analysts, and other special interest groups. According to one study, two-thirds of the subjects (holding managerial positions) interviewed indicated that any forecast of operations that they might provide would be subject to downward biasing "to avoid explaining disappointments to shareholders." Conservative forecasting thus appears to be a consequence of a "fear" on the part of management that investors and special interest groups will respond adversely to forecasts that are not met.

A final environmental consideration may be the management held belief that they will now be evaluated by the business community in terms of their ability to predict and achieve the forecasted level of operations.

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This view suggests two interpretations. First, there is the interpretation that management is opposed to establishing a standard by which they might be cursorily evaluated; and second, there is the interpretation that they will be evaluated only on their ability to achieve such a standard, not on their ability to surpass it, or on some other basis. Taken together, these views suggest that conservative forecasting is likely to result; in so doing, management is able to establish for themselves a relatively low goal which they may feel confident in attaining.

These three environmental considerations, with lesser emphasis on the first, may mediate the forecast specification process with the result that management may decide to engage in "pessimistic" forecast behavior and therefore tend to underestimate the forecasted level of operations. Some evidence does tend to support the conservative forecast hypothesis. In a study of forecasts presented in circulars for merger and take-over attempts in the United Kingdom, Westwick found that conservative forecasts, accounting for fifty-three percent of the total number of forecasts issued, exceeded optimistic forecasts by more than two-to-one. Similar results were obtained by Dev and Webb; in an examination of earnings forecasts in prospectuses for the issue of capital, they found

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16 See references 12 and 42.

17 Westwick, loc. cit.

definite trends of underestimation.

While management will most probably forecast conservatively, optimistic forecasting may arise in some circumstances. Given that the investing public places a high degree of confidence in such forecasts, the possibility of intentional stock price manipulation becomes another environmental consideration. If management anticipates that the share price will respond favorably to an overstated forecast, and if management foresees some gain resulting from such stock price manipulation, an optimistic forecast may be forthcoming.

Another environmental consideration that may also result in an optimistic forecast is the aggregate strength of the stock market. According to Ijiri, a tendency that may well develop is simply for management to make optimistic forecasts in a "bull" market and pessimistic forecasts in a "bear" market. The theory linking individual management behavior with the aggregate strength of the stock market is unclear; however, at least a portion of Ijiri's conjecture appears validated by the research of Stewarts: "There is some slight evidence that the degree of optimism of forecasts is directly related to the strength of the stock market."

The optimistic forecast hypothesis appears supported by the results of McDonald. In a five year study of U. S. firms, McDonald found the

19 See references 11, 26, and 41.

20 Ijiri, p. 167.


mean of the cross-sectional prediction error to be optimistic by 1.7, 15.6, 10.6, 12.1, and 32.1 percent for the years 1966 through 1970, respectively. The results of McDonald contrast strongly with those obtained by Westwick and by Dev and Webb; however, it must be pointed out that McDonald was utilizing U.S. firms and data published in conjunction with press releases to the Wall Street Journal, which typically tend to depict only the brighter aspects of operations.

It has been suggested that managerial behavior in the forecast situation may be described as pessimistic or optimistic, depending upon which of the environmental considerations are present. There appears to be an equal likelihood that none of these considerations will be present and/or influential and therefore managerial behavior should result in a realistic forecast of operations. What determines when and which, if any, of these environmental considerations enter into the managerial decision process is beyond the scope of this investigation; this study is only concerned with identifying the presence of any of these behavior patterns. Yet, it is not altogether clear whether this behavior can be sufficiently segmented from other unspecified external considerations to permit its identification and description.

Managerial Behavior Subsequent to Forecast Disclosure

Returning to Figure 1, the result of the managerial decision process (which is mediated by the environmental considerations attributable to the forecast disclosure situation and has as its inputs environmental assumptions, past performance, and aspiration levels) is a managerial forecast behavior, which may take one of three directions and determines the forecast of operations (box seven). As operations are undertaken, operating results may be obtained and compared with the forecast.
Deviations between the actual and forecasted results may be observed for several reasons: (1) management intentionally over or understated the forecast initially; (2) management realistically forecasted operations, yet certain of the environmental assumptions failed to hold (box eight); (3) both intentional manipulation of the forecast and the failure of certain environmental assumptions are present; and (4) management was simply a poor forecaster of operations. Regardless of the source of the forecast deviation, certain environmental considerations (box four) attributable to the disclosure situation may again be present and consequently influence subsequent managerial behavior. These environmental considerations, as well as the forecast of operations and any environmental factors causing forecast deviations, become inputs into yet another managerial decision (box nine). If management views the environmental considerations as real and important, management may decide to revise the actual or anticipated results; if such considerations are not present or, if present, considered unimportant by management, no revision attempt should be anticipated.

It has been hypothesized, therefore, that management may decide to engage in certain behavior that attempts to legitimize the previously forecasted information; that is, management may attempt to manipulate accounts and accounting methods, engage in or avoid certain business transactions, or alter certain operating policies or strategies in an effort to validate the forecasted information.\(^{23}\) In a survey of financial managers by A. T. Kearney, Inc., eighty-seven percent of the respondents indicated that they would feel a great deal of obligation toward achieving

forecasted earnings if the forecast were publicly disclosed. "A significant number of companies...mentioned that this obligation would result in strong pressure to manage earnings to meet the forecast."²⁴

An operational interpretation of this hypothesis is that management will attempt to minimize the absolute numerical deviation of actual reported results from the forecasted results. Under such an interpretation, not only will management undertake certain accounting expediencies or follow certain discretionary actions with the intention of increasing the level of reported results when actual appears to be below forecast, but similar actions by management can be expected when actual results appear to be in excess of the forecasted level.²⁵ This operational interpretation implies a symmetric, or nearly symmetric, loss function for management; that is, equal or nearly equal weightings are assumed when actual results exceed forecasted and when forecasted results exceed actual. The findings of Dev and Webb, as well as Westwick, suggest that for firms listed on the British stock exchange system such loss functions are not symmetrical, but rather more heavily weighted when forecasted results exceed actual results. A reverse result is suggested by the work of McDonald on U.S. firms.

A further operational interpretation is that managers will strive for a range of values around the forecast. It is doubtful that management would try to report results that would exactly equal the forecast, although this may be viewed as highly desirable, but rather they would simply try to insure that reported results fall within some "zone of acceptance"

²⁴Ibid, p. 54.
²⁵Ibid.
around the forecast. This interpretation reflects what Herbert Simon (in *Administrative Behavior*)\(^{26}\) referred to as "satisficing;" that is, achieving a satisfactory level of behavior rather than an optimal level of behavior. An example of this hypothesized "zone of acceptance" has occurred in the United Kingdom; the Panel on Take-overs and Mergers has established that results falling within a range of plus or minus ten percent of the forecast shall be considered acceptable. This interpretation suggests that management will attempt to insure that reported results fall within some predetermined range of the forecasted level.

Returning again to Figure 1, it was suggested that the presence or absence of certain environmental considerations could play a large role in the decision concerning managerial behavior subsequent to the forecast disclosure; that is, such environmental considerations may or may not influence management to attempt to revise the reported or anticipated operating results.

The environmental considerations that would seem likely to influence management to attempt to equate forecasted with reported results within certain limits, rather than materially exceed or fall below the forecasted levels are several. As mentioned previously, there may exist the desire to avoid lawsuit, although this point can be discounted somewhat; there may exist the desire to avoid confrontation with or criticism from current and previous investors, financial analysts, and other special interest groups; there may exist the belief that management will be evaluated according to how closely the forecast is achieved, suggesting that reliability in forecasting may become equated with a characterization of "good

management;" and finally, there may exist the desire among management to maintain a stable share price market, relative to the general economic conditions.

Depending upon these considerations, internal operations as well as the final reported results (box eleven) may or may not be altered. In either case, the actual managerial behavior and the reported results ultimately become elements of past performance (box two) and inputs to the determination of new aspiration levels (box three) at both the individual and organization level, thereby providing a feedback mechanism and completing the model.

This investigation attempts to examine only parts of this model; it will examine whether these environmental considerations influence management to behave according to a forecast-deviation minimization hypothesis (i.e., that they will attempt to revise actual or anticipated earnings in order to bring that figure closer to the forecasted level of earnings.)

27True stability is possible only when all variation in the variables affecting share price are prevented; assuming that earnings is such a variable, variation both above and below the forecasted level should be avoided. This consideration would appear to take on added significance in the case where the forecast was originally and intentionally overstated.
CHAPTER II

RESEARCH METHODOLOGY

Description of the Basic Data Unit

Financial forecast disclosure proposals have ranged in form and content from simply a brief narrative of a firm's general expectations of future profitability to a complete disclosure of comprehensive budgeted financial statements. The current state of forecasting disclosure practice is far less sophisticated than the latter proposal. In the U.K., the existing state of forecast disclosure is largely limited to forecasts of sales and earnings; in the U.S., there is much greater variation in the form and content of forecasts, but forecasting disclosure tends to be undertaken only very sporadically.

Considering the greater inherent difficulties in forecasting earnings as opposed to sales\(^1\) and the greater possibilities for the manipulation of earnings, the greatest behavioral ramifications will tend to be associated with earnings forecasts. For this reason, the basic data unit for the study was earnings forecasts.

"Earnings" was operationally defined as "profit," the British equivalent to net income in the U.S.; whether "profit" was before or after

\(^{1}\)Ijiri, pp. 163-168
taxes, before or after extraordinary items, etc. was dependent upon each individual firm forecast. Approximately 90% of the forecasts examined in this study were profits before taxes, extraordinary items, and minority interests.

Description of the Data Source

Forecasting in the U.S. is now largely quasi-official. If a firm so desires and if it meets certain SEC requirements, it may file with the Commission forecasts of sales and net income which it intends to release to the public. Such forecasting is strictly optional on the part of the firm, and where forecasts are provided, they are not subject to attestation.

For firms listed on the United Kingdom stock exchange system, the disclosure of earnings forecasts has become an accepted practice. While not specifically required by statute, earnings forecasts are included in virtually every prospectus for the issue of capital and in all circulars for take-overs and mergers. Attestation of forecasts in the case of prospectuses tends to be "indirect;" the prospectus is signed by the reporting accountants and on occasion by the issuing bank, and since the forecast is included in the prospectus, it is considered attested to because the accountants and the issuing bank have put their names to the

2 The quotation requirements for The London Stock Exchange, as stated in the publication "Admission of Securities to Listing," "encourage" firms floating new issues of capital to give forecasts, or to state their reasons for being unable to do so.
In the case of take-overs and mergers, where earnings forecasts are provided, The City Code of London on Take-overs and Mergers requires that the auditors examine and comment on earnings forecasts.4

Given these existing practices in the U.K. and the U.S., data for the study was sought from the United Kingdom. Factors leading to this decision included data availability, a history of forecasting, and, at minimum, "indirect" attestation of forecasts. A final consideration was that the use of foreign data at this time would facilitate cross-cultural replication utilizing U.S. data at a later date if and when forecasting becomes more widely practiced and more uniform in this country.

While forecasts are available from both prospectuses and circulars for mergers and take-overs, only earnings forecasts from prospectuses were examined. (See Appendix A for sample prospectus forecast.) Dev and Webb suggest that data difficulties are encountered when dealing with take-over forecasts; specifically, they suggest that "many forecasts


The London Stock Exchange publication "Admission of Securities for Listing" states: "Where a profit forecast appears in any prospectus the principal assumptions, including commercial assumptions, upon which the directors have based their profit forecast must be stated. The accounting bases and calculations for the forecast must be examined and reported on by the auditors to the company, and any reporting accountants joined with the auditors in their report, and such report must be set out. The issuing house, or, in the absence of an issuing house, the sponsoring brokers must report in addition whether or not they have satisfied themselves that the forecast has been stated by the directors after due and careful inquiry, and such report must be set out."


associated with take-over or merger proposals would not be comparable with the profits subsequently reported."

In the case of companies taken over, for example, the new managements may adopt new operating policies for the remainder of the forecast period and use different accounting assumptions in reporting results of the whole period. Also, successful bidders may not separately disclose in their annual reports the profits earned by companies taken over during the year. Thus, when bids are successful, forecast and reported profit figures may not be comparable for any of the parties involved.6

This same type of problem, however, may also arise in the case of a prospectus where a new issue of capital is listed for the purpose of consummating a merger.

The earnings forecasts were obtained from the Exel Book of New Issues of Public Companies, a quarterly publication which "contains copies of all prospectuses for issues on the London and provincial stock exchanges,"7 and The Financial Times business newspaper. The actual level of reported earnings for the period covering the forecast was obtained from the annual Statement of Accounts and Report of Directors, which was requested from each firm filing a prospectus.

The forecast period varied between prospectuses, depending upon when the prospectus was disclosed to the public in relation to the end of the firm's fiscal year. Additionally, earnings forecasts in prospectuses typically take one of two forms: (1) "profits will be £X," or (2) "profits will be at least £X."

6Ibid.

Description of the Study Period

This investigation covered the period January, 1970 through December, 1973. Phases one and two of the methodology of this study, which deal with data from the prospectuses and annual reports, covered the entire four-year period. Firms were classified by year on the basis of when the prospectus was issued, and not according to fiscal year-end. Phase three of the methodology, a questionnaire survey, covered only the period of December, 1972 through December, 1973. The firms utilized in this final phase are a subset of the firms utilized in the first two phases. This subset was chosen for two reasons: (1) the possibility of management turnover and (2) the loss of information due to human memory limitations. These problems are likely to increase with the passage of time; however, both are minimized by using the most recent subset of firms. Nevertheless, since the questionnaire was administered in early 1974, some respondents were requested to recall information from as long as one year prior.

Study Limitations

The results of this study cannot be generalized beyond the circumstances associated with the issuance of a prospectus. Management should not be expected to behave necessarily the same under a merger or take-

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8For example, a firm issuing a prospectus on October 1, 1972 and forecasting earnings for the fiscal year ending June 30, 1973, would be classified among the 1972 sample of firms.
over attempt as they might in a situation of the issuance of new capital. This point was expressed by one of the respondents to the questionnaire survey:

...I would like to make the point that public forecasting for the purposes of a prospectus is not quite the same exercise as public forecasting for say, insertion in the Annual Accounts. The former is used to base a flotation share price and is hedged around with all manner of constraints and subject to scrutiny by various bodies. All public forecasts on a going concern basis such as might appear in the Accounts or in the Chairman's statement would be nearer to a management forecast or corporate budget and would tend to have different parameters.

Further, "the companies that issue prospectus forecasts are not a representative sample of all companies, as both very large companies and those whose recent records are mediocre or worse tend to be under-represented."9

Whether the study findings can be useful to infer the response of U.S. management under the prospectus situation is also unlikely. As Popper has suggested, one cannot infer from a known population to an unknown population, for to do so is equivalent to inferring that all swans are white because in every instance we have observed only white swans.10

Phases one and two of the methodology of this study deal with ex post data, which has been subject to many external influences in addition to the original managerial behavioral intent; and, in as much as it appears impossible to completely isolate the effects of those external influences from the effects of the managerial behavior, it is at best tenuous to try to infer managerial behavioral responses from this data. The questionnaire survey, phase three of the methodology, is expected to overcome this limitation and provide some basis for inferring potential

9Dev and Webb, p. 29.

behavioral responses to the entire sample of firms issuing prospectuses. The questionnaire itself, however, is subject to the limitations that (1) it is requesting *ex post* data, (2) it is requesting the respondent to recall information from an earlier time period, and (3) the respondent is at liberty to provide any answer that he so desires, regardless of the truth.

**An Analysis of Managerial Forecast Behavior**

The first phase of the methodology of this study deals with an examination of managerial behavior as suggested by certain *ex post* forecast data. Recall from the discussion of Figure 1 that three types of managerial behavior could be exhibited: optimistic, realistic, and pessimistic. These three types of behavior could then be manifested in the actual earnings forecast as an overestimate, a realistic estimate, or an underestimate of the actual anticipated level of operations. It was suggested that the behavior implied by the forecast was also a function of the presence and importance of certain environmental considerations that could be directly attributed to the forecast disclosure situation.

Therefore, the model suggests that the first apparent effect of forecast disclosure on managerial behavior is the forecast itself. Whether the forecast is overestimated or underestimated, a behavioral response to the disclosure situation certainly appears implied.¹¹

¹¹Assuming of course that the forecaster has some reasonable forecasting ability, that the quality of his forecasting technique is satisfactory, and that no unanticipated external influences are present.
Dev and Webb indicate that realistically there is strong impetus for management to insure that forecasts in prospectuses are accurate.

If the forecast agreed by those concerned with the issue is too low in relation to prospects, the price at which the issue is made may be lower than could have been realized. If the published forecast is too low in relation to the issue price, the issue may be under-subscribed, leaving shares with the underwriters and the reputation of the company tarnished. On the other hand, the penalty of failing to reach a forecast, should it prove too high, may be a loss of status which could adversely affect the longer-run reputation of the company and, maybe, its advisors. It may also affect the market value of the shares and the cost of raising further capital. Consequently, care is taken to avoid missing the forecast. 12

Yet while such a strong impetus to accuracy exists, apparently the latter repercussions noted above are in actuality the most dreaded by management. This conclusion is based upon the findings of Dev and Webb: an examination of earnings forecasts in prospectuses for the years 1968 and 1969 yielded definite trends of underestimation. Considering that Dev and Webb utilized the same data source and the same basic data unit as this investigation, similar findings were anticipated in this study for the years 1970 through 1973; that is, it was expected that the forecasts made by the sample of firms utilized in this study would be characterized to a high degree by underestimation, hence implying pessimistic managerial behavior.

The analysis of overestimation and underestimation in forecasted earnings was accomplished by comparing earnings forecasts from the published prospectus with earnings reported in the annual Statement of Accounts, adjusted for accounting changes. Restatement of earnings prior to accounting changes was undertaken to avoid adjustments by management.

12 Dev and Webb, loc. cit.
aimed at improving the achievement of the forecast. Appendix E provides an explanation of the procedures followed to analyze the accounting adjustments.

Relative Forecast Error

The measurement of overestimation and underestimation was accomplished by computing a relative forecast error, i.e., expressing the forecast error as a percentage of forecasted earnings:

\[
\text{Forecast Error} = \frac{\text{Adjusted Reported Earnings} - \text{Forecasted Earnings}}{\text{Forecasted Earnings}}
\]

Relative Forecast Error = \frac{\text{Forecast Error}}{\text{Forecasted Earnings}}

Underestimation was indicated by positive values and overestimation by negative values. Use of the relative forecast error was necessitated by the desire to compare estimation behavior among firms. McDonald\(^\text{13}\) utilized a similar measure to examine forecast accuracy but failed to consider the effect of accounting changes on reported earnings, which may be utilized to increase the correspondence between forecasted and reported results.

The distribution of the relative forecast error utilized in this study, i.e., based on adjusted reported earnings, was not expected to differ significantly from the distribution of the relative forecast error based on unadjusted reported earnings; that is, the incidence of accounting adjustments was expected to be moderately low and the effect of the adjustments on reported earnings to be relatively insignificant. This

\(^{13}\)McDonald, loc. cit.
inference is based on the findings of Dev and Webb.\textsuperscript{14}

An examination of the reported changes in the basis of valuation and in the treatment of special items was soon abandoned because the sums involved were found to be too small to make much difference. This is not to say that considerable adjustments may not have taken place (e.g. in the exercise of subjective judgment) but that, if so, their extent was not detectable from the information disclosed in the published accounts.

Statistical Analysis and Hypotheses

The existence of overestimation and underestimation in earnings forecasts was examined by computing the following data items for each of the four study years:

1. Simple count of the incidence of overestimated and underestimated forecasts.

This data item indicated generally the trend toward overestimation or underestimation by management. In itself, this measure could not be used to conclude that management did or did not intentionally overestimate or underestimate the forecast. It could be used, however, to suggest whether managerial behavior could be described as optimistic, realistic, or pessimistic; other evidence was necessary before any definitive conclusion could be drawn.

Using this data item several related hypotheses were tested.

The \textit{a priori} reasoning of Dev and Webb, i.e., that there is a strong impetus for forecasts to be accurate, suggested the hypothesis that, under normal economic conditions, the frequency of occurrence of overestimated

\textsuperscript{14}Dev and Webb, p. 33.
and underestimated forecasts should be the same. Given the strong impetus toward accuracy, it was hypothesized that neither a tendency toward overestimation nor underestimation should be anticipated. This hypothesis was operationalized by assuming an expected frequency of 0.5; hence, the expectation that there will be an equal number of occurrences in both categories, overestimation and underestimation, was tested by means of the Binomial One-Sample Test:

\[ H_0: P_1 = P_2 = 0.5. \]
\[ H_A: P_1 < P_2, \quad P_1 = \text{expected frequency of overestimated forecasts}, \]
\[ P_2 = \text{expected frequency of underestimated forecasts}. \]

A second hypothesis tested, utilizing the results of data item one, was that the tendency in forecasting is correlated with the aggregate strength of the stock market. Ijiri has suggested that when the market may be described as "bull," management will tend to overstate the forecast; when the market can be described as "bear," management will tend to understate the forecast. The aggregate strength of the market was

\[ 15 \text{McDonald conducted a similar test utilizing a Chi-Square One-Sample Test.} \]

\[ 16 \text{The Chi-Square Test could have been used in place of the Binomial test, however, the Binomial test is superior in this instance in two respects: (1) the Binomial is an exact test while the Chi-Square is only approximate; (2) the Binomial is easier to compute when dealing with only two categories.} \]


\[ \text{Sidney Siegel, Nonparametric Statistics for the Behavioral Sciences, 1956, McGraw-Hill Book Company, New York, pp. 36-42.} \]
measured by a 200-day average\textsuperscript{17} of The Financial Times All-Share Index, an index based on 651 stocks on the London Stock Exchange. This measure was then correlated with the Relative forecast error for each firm by means of the Kendall Rank Correlation Statistic.\textsuperscript{18}

\begin{align*}
    & H_0: \text{F and M are independent.} \\
    & H_A: \text{F and M are not independent, } F = \text{size of the relative forecast error,} \\
    & \quad M = \text{aggregate strength of the market.}
\end{align*}

2. Coefficient of skewness for the distribution of relative forecast errors.

On the basis of previous research, a trend of underestimation was hypothesized. For a symmetrical distribution, the coefficient of skewness assumes a value of zero. In this study, a non-normal distribution with a long tail in the positive direction, and hence a positive coefficient of skewness, was anticipated. The coefficient is defined as:

\[
\frac{\nu_3}{\sigma_3} = \frac{\mathbb{E} ((X-\mu)^3)}{\mathbb{E} ((X-\mu)^2)^{3/2}}
\]

3. Means of the relative forecast error distributed by industry classification.

An examination of overestimation and underestimation by industry grouping was suggested by the finding of Daily,\textsuperscript{19} replicated by Dev and

\textsuperscript{17}The 200-day period, though arbitrary, was selected on the advice of Professor R. Harvey, Department of Finance, Ohio State University. The average was computed on the 200 days immediately preceding the day the forecast was published; this computation assumes that the lag time between specification of the forecast and publication date is minimal.

\textsuperscript{18}Wolfe and Hollander, p. 194; Siegel, pp. 213-233.

Webb and by the FAF,\textsuperscript{20} that the level of forecast accuracy varied according to industry classification. For this analysis, the industry classification system was based on that utilized by The Financial Times newspaper.

The null hypothesis that there is no relationship\textsuperscript{21} between industry classification and overestimation or underestimation of earnings forecasts was tested against the alternative hypothesis that a relationship exists, at least for some of the classifications:

\[ H_0: \quad T_1 = T_2 = T_3 = \ldots = T_k, \text{ where} \]
\[ k = \text{industry classification} \]
\[ T = \text{treatment (i.e. industrial classification) effect on overestimation or underestimation} \]

\[ H_A: \quad \text{the } T's \text{ are not all equal.} \]

This hypothesis was tested by means of the Kruskal–Wallis test,\textsuperscript{22} a distribution-free test directed at unordered alternatives. If the Kruskal–Wallis test rejected the null hypothesis, a Multiple Comparisons Procedure\textsuperscript{23} would be applied to determine exactly which of the industry classifications were different; and if pairs of industry classifications could be identified as different, Contrast Estimators would be utilized to estimate the difference in the relative forecast errors between the groupings. The Kruskal–Wallis statistic is defined by the following general expression,

\footnotesize


\textsuperscript{21}The term "relationship" is not used here in a correlation analysis sense.

\textsuperscript{22}Wolfe and Hollander, p. 115.

\textsuperscript{23}Ibid., p. 124.
prior to correction for ties:

$$H = \left( \frac{12}{N(N+1)} \sum_{j=1}^{k} \frac{R_j^2}{n_j} \right) - 3(N+1)$$

where $n_j$ = the number of observations from the $j$th treatment

$k \sum n_j$ = total number of observations

$R_j$ = the sum of the ranks for the $j$th treatment.

4. Means of the relative forecast error distributed by size classification.

An examination of overestimation and underestimation by firm size appeared desirable to determine if any relationship between these variables existed. Although the results of Daily\textsuperscript{24} suggest that no relationship should be found, a study by Kearney, Inc.\textsuperscript{25} did find that smaller companies experienced a greater variance in their sales forecasts than did larger companies; it can be argued from this finding that a similar relationship would exist between size and earnings variance.

The hypothesis that firm size is correlated with overestimation or underestimation was examined by means of the Kendall Rank Correlation

\textsuperscript{24} Daily, \textit{loc. cit.}

\textsuperscript{25} Kearney, Inc. and Sidney & Austin, p. 27.
method.\(^\text{26}\)

\[ H_0: \text{F and S are independent.} \]

\[ H_A: \text{F and S are not independent, } F = \text{size of the relative forecast error,} \]

\[ S = \text{firm size.} \]

Limitations of Analysis

The analysis of managerial forecast behavior assumes several important facts: (1) the environmental assumptions made by management at the time of forecast specification were validated; (2) no unanticipated influences were present; and (3) management possessed the ability and requisite techniques to forecast accurately. The failure of any one of these assumptions to hold could be the reason why, from an \textit{ex post} standpoint, a forecast is overestimated or underestimated. Under such circumstances, the analysis may fail to reveal the "true" behavioral response of management to the forecast disclosure situation. In as much as it is highly unlikely that all of the above assumptions would hold, particularly number two, it is not possible to infer the intended managerial response

\(^{26}\)Another possible test of this hypothesis is the Jonckheere test, a distribution-free test for ordered alternatives. This test was not utilized, however, because it is necessary to specify in advance the direction of the anticipated relationship, i.e., that overestimation increases as size does, or the reverse. The use of this nonparametric test and others in this study is based in part upon the finding by Dev and Webb that the distribution of the ratio of actual to forecasted earnings appeared to depart "significantly" from both the normal and lognormal forms. This finding is relevant to this study because the relative forecast error is equivalent to the Dev-Webb ratio minus one. In this study, normality was examined for by visually inspecting the distributions and examining the coefficient of skewness.
directly from the analysis of managerial forecast behavior. The final phase of the methodology of this study was an attempt to get at the true behavioral response, at least for the 1973 sample firms. If this sub-sample is viewed as representative of the larger sample (all four years), inferences regarding managerial behavior in the forecast disclosure situation can then be made.

An Analysis of Managerial Behavior Subsequent to the Forecast: The Annual Statement of Accounts

The results of the analysis of managerial forecast behavior will undoubtedly yield some indication of the conservatism, realism, or optimism of management in making forecasts for prospectuses. Westwick found, for example, that twenty-three percent of the forecasts examined in takeover attempts fell within a range of plus or minus two percent of the actual results. But was such a large percentage of forecasts validated simply because the managers were good forecasters, or were they validated as a result of certain behavioral responses by the managers?

In Chapter One, certain considerations were said to perhaps exist which would tend to motivate management to legitimize their forecasts; such considerations included management's desire to: (1) avoid lawsuit, (2) avoid criticism from stockholders and analysts, (3) maintain the confidence of the public in management and in the company, (4) maintain or obtain a reputation as "good management," and (5) maintain a relatively stable share price market.

These considerations, and others, may be thought of as creating
forecast-related or "forecast-induced pressure" for management. Intuitively, it would seem that the more conservative the published forecast, the more confident management is likely to be regarding its attainment, and hence, the less forecast-related pressure management is likely to feel. Conversely, the more optimistic the forecast, the less confident management is likely to be regarding its attainment, and hence, the greater the forecast-related pressure management will feel. While such reasoning is consistent with the "hypothesis that reported results are frequently adjusted upwards if otherwise they would fall below forecast, but rarely downward if the forecast is exceeded,"\textsuperscript{27} it is inconsistent with the theory posited by this investigation.

A Theory of Forecast-Deviation Minimization

On the basis of previous research, this study hypothesizes a "theory of forecast-deviation minimization;" that is, regardless of the direction of the forecast error, management will be motivated to insure that actual reported results fall within some accepted range of values around the forecast (proposition one),\textsuperscript{28} and the greater the actual or perceived deviation of actual results from the accepted range of values, the greater the felt forecast-induced pressure to minimize those deviations (proposition two).

\textsuperscript{27}Dev and Webb, p. 33.

\textsuperscript{28}The Kearney Inc. study is the only known documented evidence indicating that management is concerned with the variation of actual results both above and below the forecasted levels; this situation is due partly to the fact that it was the only study to have directly pursued the question of management response to both types of variation.
The "theory of forecast-deviation minimization" may be closely aligned with Festinger's theory of cognitive dissonance. The basic background of that theory consists of the notion that the human organism tries to establish harmony, consistency, or congruity among his opinions, attitudes, knowledge, and values; that is, there is a drive toward consonances among cognitions. The central hypotheses of the theory are: (1) the presence of dissonance gives rise to pressures to reduce that dissonance; (2) the strength of the pressure to reduce dissonance is a function of the magnitude of the existing dissonance. Essentially, the environmental considerations (discussed in Chapter One) may be thought of as providing management with the opinion or attitude that forecast deviations beyond an acceptable range are undesirable; when such deviations occur, dissonance arises and management is motivated to reduce or eliminate that dissonance; the relative strength of this motivation, or pressure, is a function of the magnitude of the forecast deviation.

The behavioral responses that management may emit to reduce the deviation of the forecast error from the acceptable range may be classified as "real" and "artificial." In fact, all behavioral responses are "real" in the sense that they exist; however, some responses may be indirect, or effected by some intermediary object or action, and are thus "artificial."

An artificial behavioral response refers to accounting procedures


implemented or not implemented for the purpose of minimizing the deviation between actual and forecasted results. An example is a change in the method of depreciating long-lived assets in order to reduce expenses and thereby raise reported results closer to the forecasted level. The behavioral response was thus not direct, but affected by means of an accounting procedure.

A real response refers to the discretionary actions that management may undertake to influence revenues and expenses. For example, a real response may "refer to an actual transaction that is undertaken or not undertaken" on the basis of its affect in terms of minimizing the deviation between forecasted and actual results. Such a response might be exemplified by the suppression of earnings for the current period and transfer to a future period. A response of this nature would be expected when actual performance appears to be materially in excess of forecasted performance. Similarly, where the forecast appears materially in excess of actual results, desirable expenditures may be postponed in order to prevent any further drain on actual results.

This dichotomy of potential managerial responses into real and artificial suggested a two part methodology to examine the first proposition of the theory of forecast-deviation minimization.

The first part (actually phase two of the entire study methodology) was directed at management's artificial responses and involved an examination of the annual statement of accounts to determine what accounting changes, if any, were undertaken and their influence on reported earnings. Referring to Figure 2 below, proposition one suggests that firms will
strive to report results falling within the "zone of acceptance." Using the annual statement of accounts, earnings prior to any accounting changes were reconstructed to determine if the accounting adjustment altered the actual level of earnings from outside to within the zone of acceptance.

(Dotted lines denote boundaries of the Zone of Acceptance: ± X %)

Figure 2: Zone of Acceptance

According to proposition one, if the reconstructed earnings number is found to be outside of the zone of acceptance (points A and B), the accounting change will bring the actual results closer to or within the zone (points C and D). Two additional interpretations of the proposition are implied: (1) if actual results fall within the zone of acceptance, no accounting changes should be expected; (2) if actual results fall within the zone of acceptance and accounting changes are present, the effect of such changes should not be sufficient to move reported earnings outside of the zone of acceptance. (Note: In this situation, (2), the

31 It was necessary to ascertain a numerical zone of acceptance. It was considered infeasible to determine a zone for each individual firm; hence the firms in the questionnaire survey were requested to specify an acceptable percentage deviation. The median of these responses was utilized as the zone of acceptance for all firms; the median, rather than the mean, was used to avoid domination by outlying scores. If this approach was found to be unsuccessful, the range of plus or minus 10% utilized by the Panel on Take-overs and Mergers would have been used.
accounting change need not move actual results closer to forecasted results, but merely maintain actual results within the zone of acceptance.)

Data items of interest included:

1. The frequency of forecasts supporting proposition one.
2. The relationship between the total number of forecasts falling within the zone of acceptance and the number of forecasts supporting proposition one.
3. The frequency of forecasts supporting proposition one (a) where the accounting adjustments resulted in an increase in reported results and (b) where the accounting adjustments resulted in a decrease in the reported results.
4. The frequency of forecasts supporting proposition one classified according to (a) firm size and (b) firm industry.

It must be pointed out that while the above data items may indicate "support" for proposition one, they cannot be construed to verify the proposition. This methodology deals with data subject to many influences not under control in this investigation, and therefore it is not possible to infer directly that the data indicates a particular managerial response; however, a questionnaire survey was used to ascertain whether or not the 1973 sample firms did utilize or avoid utilizing accounting changes in a manner consistent with proposition one.

The second part of the methodology under proposition one (actually phase three of the entire study methodology) entailed a questionnaire survey of management to determine if forecast disclosure elicited any real managerial responses. 32 The questionnaire was sent to a sample of managing directors and financial directors of the firms issuing prospectuses in 1973.

32 It is a well established fact that the success of a questionnaire is in the hands of the respondents in that they are able to reply in any manner that they so desire.
A Note Concerning the Prospectus Situation

The prospectus situation can be viewed as an extreme setting in which to test the first proposition, particularly in relation to artificial responses. The prospectus involves a once-and-for-all forecast in that very few firms issue capital year in and year out. Intuitively, under such single forecast circumstances, it would appear more likely to find incidences of real and artificial responses.

In most cases the behavioral response works simply to shift the impact of results from one accounting period to another; hence, when contemplating such a response, management must also consider the impact of such a response on next period's operations. Under continuous forecasting circumstances, management must consider the effect of such a response on the ability of the firm to achieve the forecast in the next period. In the single forecast case, e.g. the prospectus situation, there need be no concern for next period's forecast (because there won't be any), and for this reason, there would seem to exist a greater propensity for management to utilize such behavioral responses.

An Analysis of Managerial Behavior Subsequent to the Forecast: A Questionnaire Survey

The third and final phase of the methodology of this investigation was a questionnaire survey. The survey had three primary purposes: (1) to ascertain whether management did or did not intentionally overestimate or underestimate the earnings forecast; (2) to determine whether management intentionally utilized any real or artificial responses in an effort to reduce forecast deviations to an acceptable level; and (3) to provide
a measure of forecast-induced pressure in order to test the second proposition of the theory of forecast-deviation minimization.

The second proposition of the theory may be restated as follows:

Proposition 2: The greater the actual or perceived deviation of actual results from the zone of acceptance, the greater the felt forecast-induced pressure to minimize those deviations.

Operationally, a high, positive correlation was anticipated between the actual or perceived forecast deviation from the zone of acceptance and the level of forecast-induced pressure.

The questionnaire (see appendix E) was submitted to a sample of firms that published prospectuses during the period December, 1972 through December, 1973. The information requested by the questionnaire was believed to be sufficiently sensitive that a guarantee of anonymity was necessary; even so, several respondents returned their questionnaires unanswered indicating that the information requested was too sensitive to be released.

Pretesting of the questionnaire was undertaken by several members of the dissertation committee and several doctoral students at The Ohio State University. Pretesting indicated certain ambiguous and confusing questions requiring revision, numerous overlapping questions to be eliminated, and provided a rough estimate of the time required to complete the questionnaire (40 to 60 minutes).

The questionnaire consisted of two parts. Part one requested information about the forecasting process within the firm in an attempt to provide either confirmation or rejection of the inferences suggested by the ex post data utilized in phases one and two of the study methodology. Part two was the "forecast-induced pressure questionnaire," which attempted to provide a quantitative index of the pressures to minimize forecast
deviations.

Construction of the Questionnaire

Part one of the questionnaire was developed to achieve two basic objectives: (1) to ascertain whether management did or did not intentionally overestimate or underestimate the forecast, and (2) to determine whether management intentionally utilized internal behavioral responses for the purpose of reducing forecast deviations. Part one was sectionalized according to these objectives. Section A was directed at: (1) gathering background information on the firm and the forecasting process through questions that were also designed with the intention of getting the respondent involved in his task; (2) establishing a zone of acceptance for the firm; and (3) providing a consistency check for part two of the questionnaire, the forecast-induced pressure questionnaire. Section B was directed at: (1) verifying the results of the ex post data by providing answers to questions such as "Was the forecast intentionally overestimated or underestimated? And, if so, why and by how much?"; (2) providing a consistency check of the questionnaire responses, utilizing certain ex post data items; and (3) gathering information concerning the extent to which the forecasting process was perceived to be influenced by uncontrollable external influences. Section C was directed at verifying the use of real and artificial responses; that is, were accounts, accounting methods, operating decisions or policies altered by management for the purpose of reducing forecast deviations.

A question-by-question analysis of part one is presented in Appendix G.
Construction of the Forecast-Induced Pressure Questionnaire

Part two of the questionnaire was the "forecast-induced pressure questionnaire." This questionnaire was developed from a list of activities, events, and statements concerning forecast disclosure. This list, which was obtained from the forecasting literature, served as the basis for the questionnaire items; by numerically scoring the items, a measure of forecast-related pressure was obtained.

Initially the list was composed of eighty-seven items. Duplications and items not in a pressure context were subsequently eliminated until only fifty items remained in the final draft. These items can be divided into the following seven classifications:

1. Pressure from the method of forecast development.
2. Pressure from the forecast itself.
3. Pressure from forecast administration.
4. Personal activities suggesting forecast-related pressure.
5. Pressure from investors and other interested parties.
6. Pressure from the stock market.
7. Beliefs and opinions suggesting forecast-related pressure.

An explanation of each of these classifications follows.

1. **Pressure from the method of forecast development.**

   Forecasts, like budgets, may be either imposed or participatively set. Participation in such a process tends to lead to the internalization of the forecast as a self-imposed goal. Where such forecasts are internalized, management is likely to feel closely aligned with the forecast and hence more likely to be willing to expend greater effort to achieve such forecasts. Consequently, management will tend to feel less

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33 John P. Pertakis, "Budget-Induced Pressure and Its Relationship to Supervisory Behavior in Selected Organizations," unpublished doctoral dissertation, 1967, University of Washington; this research provided much of the framework for part two of the questionnaire.
pressure concerning forecast attainment. Conversely, where forecasts are imposed, management will feel greater forecast-related pressure. Questionnaire items within this category are:

1. I was responsible for developing the forecast. (L)
2. I played a major role in the preparation of the forecast. (L)
3. Special problems that I mentioned received special treatment during the preparation of the forecast. (L)
4. The forecast included changes that I suggested. (L)
5. The forecast was completely consistent with my own beliefs about the company's future operations. (L)

2. Pressure from the forecast itself.

The "tightness" or "looseness" of a forecast may be a source of pressure; that is, if the forecast is set too high relative to aspirations, it may become viewed as unattainable, consequently causing a certain amount of forecast-related pressure concerning achievement. Similarly, difficulty in forecasting future activity levels of the company may be a source of forecast-related pressure; however, the pressures associated with both of these factors may be significantly alleviated if the manager has the opportunity to revise or change the forecast. In so doing the manager may be able to bring the forecast more into line with his own expectations regarding future operations, and thereby reduce his felt pressure. Questionnaire items within this category are:

6. The forecast was easily achievable. (L)
7. The forecast was set too high to achieve without special effort by the management. (H)
8. It is difficult to forecast future activity levels in this company. (H)
9. The forecast was or could be changed to reflect unexpected
changes in the company's operating conditions. (L)

3. **Pressure from forecast administration.**

Depending upon (1) the degree of importance attached to forecast achievement within the firm, and (2) the type of procedures utilized to insure forecast achievement, forecast-related pressures may be generated. Pressure is likely to be generated if meetings are held and reports prepared concerning forecast attainment; such events give an impression of great concern for forecast achievement, creating a high awareness of this fact on the part of the manager attending such meetings or receiving such reports. Similarly, if the issue of forecast achievement becomes part of the performance evaluation process, a great deal of pressure is likely to be felt by the manager. Questionnaire items within this category are:

10. I have attended company meetings where the importance of achieving the forecast was discussed. (H)

11. I have attended company meetings in which a discussion of ways to avoid forecast variances was conducted. (H)

12. I have received reports comparing actual operating results with the forecasted operating results. (H)

13. Forecast variances have been mentioned during performance evaluation interviews. (H)

4. **Personal activities suggesting forecast-related pressure.**

In as much as the respondents to the questionnaire are high level managers, it is possible that they may have initiated certain actions or events which would appear, at least superficially, to be motivated by forecast-related pressure. For example, consulting other top level managers on issues related to forecast achievement can be interpreted as an action motivated by pressures to achieve the forecast. Perhaps even more
significant are personal actions relating to the use of alternative
to the use of accounting methods and discretionary actions designed at reducing fore-
cast variances. Questionnaire items within this category are:

14. I have expressed dissatisfaction to some of my subordinate
members of management concerning apparent forecast variances. (H)

15. I have received telephone calls on forecast variance matters
from other members of the company management. (H)

16. I have consulted other members of the company management
about increasing or decreasing output in order to achieve
the forecasted goal. (H)

17. I have spoken to the company's top advisors on matters con-
cerning forecast variance. (H)

41. I have made operating decisions on the basis of their
effect on forecast variances. (H)

42. I have suggested that the short-run performance of the
company be altered to help reduce forecast variances. (H)

43. I have suggested the use of alternative accounting methods
as a means to reduce potential forecast variances. (H)

Several items (questions forty-one through forty-three) in this category
have a dual function: they provide a consistency check on questions two
through four in Section C, dealing with the use of accounting methods and
discretionary actions to reduce forecast deviations.

5. Pressure from investors and other interested parties.

Perhaps the greatest source of forecast-related pressure is external:
investors, financial analysts, and other third parties. By disclosing an
earnings forecast, management has established a standard by which they may
be publicly and cursorily evaluated. Undoubtedly an individual's anxiety
increases when he feels that his performance will be measured and evalu-
ated by an external party. Additionally, a certain amount of pressure
must be associated with the idea that failure to obtain a self-established goal raises serious questions concerning one's capabilities. Questionnaire items within this category are:

18. Stockholders will evaluate my performance by comparing the company's actual performance with the forecasted performance. (H)

19. The investing public views a forecast revision as a sign of poor management. (H)

20. Forecast variances adversely affect the credibility of management in the eyes of the investing public. (H)

21. It is difficult to explain forecast variances to investors. (H)

22. Investors misinterpret forecasts. (H)

23. Investors will react unfavorably to intentional overstatement of forecasts. (H)

24. Investors will react unfavorably to intentional understatement of forecasts. (H)

25. Investors will criticize management when forecast variances occur. (H)

26. Investors regard forecasts as guarantees of performance by the company. (H)

27. Investors evaluate management on their ability to achieve forecasts. (H)

28. The company has an obligation to investors to insure that forecasts are attained. (H)

29. A failure to attain a forecast would severely reduce the investing public's confidence in the company. (H)

30. I have received letters from stockholders regarding forecast variances. (H)

31. Investors place unwarranted confidence in the accuracy of prospectus forecasts. (H)

32. The forecast is an extremely important factor in the investor's investment decision. (H)

33. Investors will misinterpret any forecast variance. (H)
34. Forecast variances will result in a loss of reputation for the company and management. (H)

35. Investors view the ability to achieve forecasts as more important than the company's previous operating record. (H)

36. If the forecast is not met, the company may be subject to legal proceedings by investors. (H)

40. Forecast variances are certain to lead to critical comments by financial analysts regarding the effectiveness of this company's management. (H)

6. **Pressure from the stock market.**

Very much related to the previous category of questionnaire items is the forecast-related pressure generated by security or commodity market factors. If management views maintaining a stable share price as desirable, and if forecast variances are viewed as contributing to price variability, then pressure is likely to be felt. Similarly, if management believes that the cost of raising future capital will be affected by the firm's success in attaining the current prospectus forecast, then pressure will again be felt. Questionnaire items within this category are:

37. Forecast variances adversely affect the price of a company's stock. (H)

38. Minimizing forecast variances is important to maintain a stable stock price. (H)

39. Failure to achieve forecasts will affect the cost of raising capital in the future. (H)

7. **Beliefs and opinions suggesting forecast-related pressure.**

The final category of forecast-related pressure items is a group of miscellaneous attitudes, beliefs, and opinions. If these attitudes and opinions are strongly held, then presumably pressure will be felt. For example, if a manager shares the opinion that "forecast variances
adversely affect my job security," then he is likely to feel pressures to attain the forecast. Similarly, where a manager believes that forecasting restricts his flexibility in operations, he is also likely to feel pressure. Questionnaire items within this category are:

44. I am reluctant to undertake certain risks that might otherwise be undertaken because of my concern for minimizing the forecast variance. (H)

45. I am responsible for forecast compliance. (H)

46. Minimizing the forecast variance is extremely important to me. (H)

47. Forecast variances adversely affect my job security. (H)

48. It is extremely important to insure that actual results do not significantly fall below the forecasted level of results. (H)

49. It is extremely important to insure that actual results do not significantly exceed the forecasted level of results. (H)

50. Forecasting limits management flexibility and prerogatives in operations. (H)

Scoring the Questionnaire

The results of part one of the questionnaire were scored as frequency counts and percentages, and will be discussed in detail in chapter three.

Part two, the "forecast-induced pressure questionnaire," was scored in such a manner that a quantitative index of the pressure to minimize forecast deviations was obtained. The fifty items of part two were assigned a numerical weighting on the basis of whether the item represented a high ("H") or low ("L") pressure item. A Likert-type scale
technique\textsuperscript{34} was used to assign values to the items to represent various degrees of felt pressure. The intensity scale utilized was:

- strongly agree
- agree
- undecided
- disagree
- strongly disagree

A response of "strongly agree" to an item marked "L" indicated low felt pressure; a response of "strongly disagree" to a low pressure item indicated high felt pressure. Conversely, a response of "strongly agree" to an item marked "H" indicated high felt pressure, while a response of "strongly disagree" indicated low felt pressure.

For the fifty items of the pressure questionnaire, the following numerical weightings were utilized:

<table>
<thead>
<tr>
<th>Response</th>
<th>Numerical Weighting</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High Pressure Items</td>
</tr>
<tr>
<td>strongly agree</td>
<td>5</td>
</tr>
<tr>
<td>agree</td>
<td>4</td>
</tr>
<tr>
<td>undecided</td>
<td>3</td>
</tr>
<tr>
<td>disagree</td>
<td>2</td>
</tr>
<tr>
<td>strongly disagree</td>
<td>1</td>
</tr>
</tbody>
</table>

Summing the numerical score on each of the questionnaire items yielded an index of the forecast-induced pressure.\textsuperscript{35} Since the questionnaire contained fifty items, the range of the pressure index was a high of 250 to a low of 50.

The forecast-induced pressure index was then correlated to either the actual or perceived forecast deviation,\textsuperscript{36} depending upon whether or


\textsuperscript{35} See Pertakis, \textit{loc. cit.}, for an explanation of the development of the "budget-induced pressure index."

\textsuperscript{36} Questionnaire item eleven of Section B was directed at ascertaining the perceived forecast deviation in those cases where the period covered by the forecast had not yet ended.
not the forecast period had ended at the time the questionnaire was completed. The methodology used to correlate these measures was the Kendall Rank Correlation method.

Validity of the Questionnaire

"The validity of a test, or of any measuring instrument, depends upon the fidelity with which it measures what it purports to measure."\(^{37}\) Validity is typically measured by comparing the results obtained from one measuring instrument with the results obtained from some standard instrument of known validity. This is usually accomplished by computing the correlation between the two sets of scores; presumably, if the correlation of the two sets is high, the test is valid. This statistical approach, however, requires that some objective or standard measuring device be available.

Unfortunately, this approach could not be applied in this investigation. The validity of the forecast-induced pressure questionnaire could not be established quantitatively because no other measurement instrument of known validity, to which the results of the pressure questionnaire could be correlated existed. Accordingly, this study relied upon the "face" or surface validity of the questionnaire.

Face validity is "the quality which makes a test appear sensible for the purpose it is to serve."\(^{38}\) The forecast-induced pressure questionnaire was constructed from a list of activities, events, and statements


\(^{38}\text{Fertakis, }\textit{loc. cit.}\)
in which pressure was implied. This list was developed from the results of other questionnaire research studies (3, 4, 5, 7, 15, 20, 22, 23, 28, 40, 41) and from the conclusions deduced by others (8, 11, 13). In many cases the items were direct statements made by managers in a forecast situation. For these reasons, it is felt that the forecast-induced pressure questionnaire possessed a relatively high level of validity; equally important, however, is the fact that the results obtained from the questionnaires themselves appeared to possess validity.

The validity of the Forecast-Induced Pressure Questionnaire, however, is subject to some question in one respect. Seven pressure classifications were identified, containing from three to twenty questionnaire items. In the scoring of the pressure questionnaire, each of the items was given an equal weighting; consequently, the seven pressure classifications were given a differential weighting depending upon the number of questionnaire items each contained. The appropriateness of this differential weighting scheme was not tested. A factor analytic approach could have been utilized, however, the small number of respondents (31) prevented the use of such a technique. Therefore, given this untested differential weighting of pressure classifications, some question may be raised as to whether the pressure questionnaire measures what it purports to measure.

Reliability of the Questionnaire

The reliability of the forecast-induced pressure questionnaire was measured by means of Kuder and Richardson's equation 20 for scale reliability. Reliability, the degree of consistency in repeated measurements,
is most commonly measured by the "split-half" technique; this method was not utilized in this study because the approach fails to provide a unique value of reliability.

The results of the reliability test are important with respect to the validity of the questionnaire. According to Garrett, while reliability and validity refer to different concepts, they are essentially referring to just different aspects of the same thing, test efficiency. Therefore, if a test is shown to be highly reliable, it implies that the test is also valid; "to be valid a test must be reliable." The results of the test for reliability of the questionnaire were consequently used as an indication of the validity of the questionnaire as well; reliability is a necessary but not sufficient condition to establish validity.

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40 Ibid., p. 152.
41 Garrett, p. 360.
CHAPTER III

ANALYSIS OF THE DATA

The results of the data description are presented in the first part of this chapter. The results of the analysis of managerial forecast behavior are then presented and analyzed. The chapter is concluded with the presentation of the results of the analysis of managerial behavior subsequent to forecast disclosure.

Data Description Results

Description of Sample

A list of firms issuing prospectuses was obtained from the Extel Book of New Issues of Public Companies for years 1970 through 1972, and from The Financial Times business newspaper for 1973. The list was reviewed to determine which firms had disclosed an earnings forecast in their prospectus. The subpopulation of firms providing useable forecasts numbered 75, 87, 115, and 70 for the years 1970 through 1973 respectively. To each of the 347 firms, a letter was sent requesting a copy of their

1At the time the investigation was undertaken, the Extel publication for 1973 had not yet been published. Therefore it was necessary to find an alternative source of prospectuses for 1973, which was to be The Financial Times; however, not all firms necessarily publish their prospectuses in The Times. Hence, it is possible that the total population of firms issuing prospectuses in 1973 was not surveyed.

52.
annual statement of accounts and report of directors. The purpose for requesting the report was disguised in the letter (see Appendix B) because it was anticipated that a higher response rate could be achieved if the firms were unaware that their reported results would become part of an investigation of this nature.

From the initial 347 letters of inquiry (in some cases, one or more follow-up letters were necessary), 276 useable\(^2\) reports were received. An overall response rate of 79.5\% was attained. These returns are provided on a yearly basis in Table 1. Also, appendix C provides a listing of the sample for each of the study years.

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Reports Received</th>
<th>Response Rates</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
<td>50</td>
<td>66.7%</td>
</tr>
<tr>
<td>1971</td>
<td>68</td>
<td>78.2%</td>
</tr>
<tr>
<td>1972</td>
<td>102</td>
<td>88.7%</td>
</tr>
<tr>
<td>1973</td>
<td>56</td>
<td>80.0%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>276</td>
<td>79.5%</td>
</tr>
</tbody>
</table>

Of the 276 reports received, only 274 different firms are represented. Two firms issued a prospectus and useable forecast in more than

\(^2\)In some cases, particularly with respect to the 1970 sample firms, copies of the annual report were no longer in stock. In other cases, certain firms were eliminated because their reported results were not comparable to the forecasted results, e.g. they engaged in acquisitions and divestitures during the forecast period and failed to disclose sufficient information regarding those activities. For example, one firm sold a subsidiary, acquired two others, and included in total company profits 5 1/2 months of profit from one of the newly acquired subsidiaries and 2 1/2 months of profit from the other recent acquisition, yet in both cases failed to disclose these amounts or information sufficient to ascertain these amounts.
one year, and therefore appear in the sample twice. Additionally, several firms issued prospectuses containing more than one forecast, one for the current fiscal period and one for the following fiscal period. The double-forecasts occurred with the following frequency:

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Occurrences</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
<td>1</td>
</tr>
<tr>
<td>1971</td>
<td>2</td>
</tr>
<tr>
<td>1972</td>
<td>3</td>
</tr>
<tr>
<td>1973</td>
<td>7</td>
</tr>
</tbody>
</table>

For data analysis purposes these seven forecasts were treated as separate and distinct data observations. Consequently, instead of only 276 data points, a total of 283 data points are analyzed. The inclusion of the two second-time forecasts and the seven double-forecasts in the sample is not viewed as "polluting" the data analysis.

The sample may be described from three perspectives: (1) the type of share issue, (2) industrial classification, and (3) firm size.

There are four basic types of capital issues: (1) placing, (2) introduction, (3) offer for sale, and (4) offer for sale by tender. Table 2 displays the distribution of the prospectuses classified according to the type of share issue.

Table 2: Types of Share Issues

<table>
<thead>
<tr>
<th>Type of Issue</th>
<th>1970</th>
<th>1971</th>
<th>1972</th>
<th>1973</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Placing</td>
<td>7</td>
<td>8</td>
<td>5</td>
<td>12</td>
<td>32</td>
</tr>
<tr>
<td>Introduction</td>
<td>12</td>
<td>21</td>
<td>19</td>
<td>20</td>
<td>72</td>
</tr>
<tr>
<td>Offer for Sale</td>
<td>32</td>
<td>40</td>
<td>81</td>
<td>23</td>
<td>176</td>
</tr>
<tr>
<td>Offer for Sale by Tender</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>TOTALS</td>
<td>51</td>
<td>70</td>
<td>105</td>
<td>57</td>
<td>283</td>
</tr>
</tbody>
</table>
Table 3 provides an industrial categorization of the sample firms. The classification system is consistent with that utilized in the share price pages of The Financial Times newspaper. Where only a single observation occurred in a particular category during the four year period, that category was subsumed under the most nearly-related category, e.g., the "Machine Tool" category was subsumed under the "Miscellaneous Industrials" category.

Table 3: Industrial Classification

<table>
<thead>
<tr>
<th>Industrial Classification</th>
<th>Year of Forecast</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Banks and Hire Purchase</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Beers, Wines, and Spirits</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Building Industry, Timber and Roads</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>Chemicals, Plastics, etc.</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Cinemas, Theatres, and T.V.</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Drapery and Stores</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Electrical and Radio</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Engineering and Metal</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Food, Groceries, etc.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Hotels and Caterers</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Miscellaneous Industrials</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td>Motors, Aircraft Trades</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Newspapers, Publishers</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Paper, Printing, Advertising</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Property</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Textiles</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Trusts, Finance, Land</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td><strong>TOTALS</strong></td>
<td><strong>51</strong></td>
<td><strong>70</strong></td>
</tr>
</tbody>
</table>

Firm size can be defined in a variety of ways. Typically, size has been defined in terms of some accounting measurement, such as total assets, total revenues, or net earnings. In this study, size was defined as average total assets: 1/2 (beginning total assets + ending total
assets). As would be expected, the range of average total assets varied between the study years, consequently creating some difficulty in the selection of a consistent system of size categories. The following size classification system was chosen because it provided a reasonable subdivision of size into homogeneous categories and because it provided a useable distribution of the observations:

1. Under $1,000,000.
2. To $2,000,000.
3. To $3,000,000.
4. To $4,000,000.
5. To $7,000,000.
6. To $10,000,000.
7. To $20,000,000.
8. Above $20,000,000.

Table 4 provides the results of the subpopulation distributed according to size classification.

<table>
<thead>
<tr>
<th>Average Total Assets</th>
<th>Year of Forecast 1970</th>
<th>Year of Forecast 1971</th>
<th>Year of Forecast 1972</th>
<th>Year of Forecast 1973</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under $1,000,000</td>
<td>15</td>
<td>11</td>
<td>11</td>
<td>6</td>
<td>43</td>
</tr>
<tr>
<td>To $2,000,000</td>
<td>9</td>
<td>20</td>
<td>23</td>
<td>15</td>
<td>77</td>
</tr>
<tr>
<td>To $3,000,000</td>
<td>7</td>
<td>4</td>
<td>15</td>
<td>7</td>
<td>33</td>
</tr>
<tr>
<td>To $4,000,000</td>
<td>4</td>
<td>9</td>
<td>12</td>
<td>9</td>
<td>34</td>
</tr>
<tr>
<td>To $7,000,000</td>
<td>3</td>
<td>7</td>
<td>16</td>
<td>10</td>
<td>36</td>
</tr>
<tr>
<td>To $10,000,000</td>
<td>4</td>
<td>5</td>
<td>7</td>
<td>2</td>
<td>18</td>
</tr>
<tr>
<td>To $20,000,000</td>
<td>5</td>
<td>6</td>
<td>5</td>
<td>3</td>
<td>19</td>
</tr>
<tr>
<td>Above $20,000,000</td>
<td>4</td>
<td>8</td>
<td>6</td>
<td>5</td>
<td>23</td>
</tr>
<tr>
<td>TOTAL</td>
<td>51</td>
<td>70</td>
<td>105</td>
<td>57</td>
<td>283</td>
</tr>
</tbody>
</table>

It can be observed that in each of these tables, the sample is dominated by a particular category. In Table 2, the "Offer for Sale" category dominates the type of share offering; in Table 3, the
"Miscellaneous Industrials" category dominates the industry classifications; and in Table 4, the size category "To £2,000,000" dominates the size classifications. The significance of these dominating categories for the data analysis will be considered in later sections.

Description of Forecast Type

The forecast issued in a prospectus typically assumes one of two forms: (1) "profit will be $X," or (2) "profits will be at least $X," the distinction between these two forms appears to be important from a behavioral standpoint. The first type suggests a more explicit or exact forecast, allowing little variation either above or below. The second type appears less exact, allowing for almost unbounded levels of results above the forecast. Intuitively, a greater number of behavioral responses consistent with the theory of forecast deviation minimization would seem to characterize the first type; hence, a comparison of the behavioral responses under each form would appear appropriate. Table 5, which displays the results of a frequency count of the type of forecast, reveals that type one forecasts, "profits will be $X," account for less than 14% of the entire sample. Given this small percentage, an analysis on a year-by-year basis was not statistically feasible; therefore, due to the limited cell sizes, the analysis was not undertaken.

Table 5: Forecast Type

<table>
<thead>
<tr>
<th>Forecast Type</th>
<th>Year of Forecast</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) &quot;profits will be $X&quot;</td>
<td>12</td>
</tr>
<tr>
<td>(2) profits will be at least $X&quot;</td>
<td>39</td>
</tr>
<tr>
<td>TOTAL</td>
<td>51</td>
</tr>
</tbody>
</table>
An analysis for trend in forecast type was undertaken. The percentage of firms utilizing type one forecasts was 23.5, 8.6, 11.4, and 15.8 for the years 1970 through 1973 respectively. A trend toward the increased utilization of type two forecasts could be hypothesized in that this form would appear to allow management greater flexibility during periods of increasing uncertainty. The percentages do not indicate the existence of such a trend; a Kendall-Mann Trend Test was conducted, yielding an insignificant Kendall K statistic (K = 0, hence \( Q = 0.625 \)).

An analysis was also undertaken to determine if any relationship existed between the type of forecast issued and the success in achieving the forecast. Of the failures to achieve the forecast, two of three, five of seven, seven of nine, and two of four, for the years 1970 through 1973, utilized form two. Presumably a greater number of failures to achieve the forecast would be expected to utilize form two rather than form one because the second form appears to establish an absolute minimum level of results. A relationship between the utilization of form two and the failure to achieve the forecast was not obtained; only 7% of those firms utilizing form two failed to achieve their forecast, whereas 18% of the firms utilizing form one failed to achieve their forecast.

A final inference may be drawn from Table 5. The theory of forecast-deviation minimization presented in Chapter Two was premised in the
assumption that management possessed a symmetric loss function with respect to forecast deviations about the zone of acceptance. The overwhelming incidence of type two forecasts implies the contrary. The results of Table 5 suggest that it may be inferred that management's loss function is not symmetric, but rather asymmetric with a heavier weighting place on deviations below the zone of acceptance. This inference will be discussed further in conjunction with the data analysis relating to the theory of forecast-deviation minimization.

Description of Forecast Period

The forecast period varied between prospectuses depending upon when the prospectus was disclosed to the public in relation to the end of a firm's fiscal year. Considering all four study years, 1970 through 1973, the average length of the forecast period was 134.8 days, with a maximum forecast period of 533 days and a minimum forecast period of minus 52 days. The minus sign indicates that the prospectus was published, and therefore the earnings forecast disclosed, subsequent to the end of the firm's fiscal year. Table 6 presents the average length and range of the forecast period for each of the four years.

<table>
<thead>
<tr>
<th>Year</th>
<th>Average Length (in days)</th>
<th>Range Maximum</th>
<th>Range Minimum</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
<td>145.1</td>
<td>391</td>
<td>7</td>
</tr>
<tr>
<td>1971</td>
<td>140.4</td>
<td>533</td>
<td>-32</td>
</tr>
<tr>
<td>1972</td>
<td>150.8</td>
<td>442</td>
<td>-52</td>
</tr>
<tr>
<td>1973</td>
<td>91.0</td>
<td>461</td>
<td>-52</td>
</tr>
<tr>
<td>ALL FOUR YEARS</td>
<td>134.8</td>
<td>533</td>
<td>-52</td>
</tr>
</tbody>
</table>
It can be observed that with the exception of 1973, the average length of the forecast period is approximately five months. Consequently, in three of the four years, the forecast is issued on the average during the early or middle part of the third quarter of operations. In preparing the forecast management is typically knowledgeable of at most one-half year of current operations and earnings. The average forecast period therefore appears to be sufficiently lengthy to insure (1) that management is faced with uncertainty as to results and (2) that management has sufficient time to consider the utilization of discretionary actions as hypothesized in the theory of forecast-deviation minimization.

It has been found that the length of the forecast period is positively and significantly correlated with accuracy in forecasting. In theory, forecasting errors would be expected to increase in magnitude as the length of the forecast period increased; presumably, as the length of the period increases, the amount of uncertainty increases and the level of difficulty in forecasting increases. Further, "if it is considered important to avoid failing to meet forecasts, [the forecast] would be made more conservative as forecast intervals lengthen by increasing the contingency discount."\(^3\) This hypothesis was tested by correlating the absolute value of the relative forecast error with the length of the forecast period, measured in days. The absolute value of the forecast error must be utilized because the hypothesis refers to the relative size (accuracy) of the forecast, and not to whether it was overestimated or underestimated.

The statistical method utilized was the Kendall Rank Correlation

\(^3\)Dev and Webb, p. 31.
method. The results are displayed in Table 7.

Table 7: Results of The Kendall Rank Correlation Coefficient For The Absolute Relative Forecast Error and The Length of The Forecast Period

<table>
<thead>
<tr>
<th>Year</th>
<th>Kendall $\hat{\tau}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
<td>0.2698*</td>
</tr>
<tr>
<td>1971</td>
<td>0.1992*</td>
</tr>
<tr>
<td>1972</td>
<td>0.2386*</td>
</tr>
<tr>
<td>1973</td>
<td>0.1272</td>
</tr>
<tr>
<td>ALL FOUR YEARS</td>
<td>0.2174*</td>
</tr>
</tbody>
</table>

* significant at a level of probability less than 0.01

The results confirm the hypothesis in every case except 1973, which was nevertheless significant at a level of probability less than 0.10. Therefore, in the sample studied, it can be concluded that the size of the relative forecast error was positively and significantly correlated with the length of the forecast period.

Data Analysis of Managerial Forecast Behavior

Analysis of Overestimated and Underestimated Forecasts

The incidence of overestimated and underestimated forecasts was examined by computing the relative forecast error for each firm during the four year period. On the basis of research by Dev and Webb utilizing similar data for the years 1968 and 1969, a significant trend of underestimation was predicted. This prediction was obtained as indicated by the results of Table 8. In 1970 through 1973 respectively,
Table 8: Results of The Analysis of Overestimated and Underestimated Forecasts

<table>
<thead>
<tr>
<th>Year</th>
<th>Incidence of Forecasts Overestimation</th>
<th>Underestimation</th>
<th>Range of Relative Forecast Error</th>
<th>Distribution of Relative Forecast Error</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Maximum</td>
<td>Minimum</td>
</tr>
<tr>
<td>1970</td>
<td>4</td>
<td>47</td>
<td>+0.9025</td>
<td>-0.4858</td>
</tr>
<tr>
<td>1971</td>
<td>9</td>
<td>61</td>
<td>+1.8250</td>
<td>-0.7056</td>
</tr>
<tr>
<td>1972</td>
<td>7</td>
<td>98</td>
<td>+1.0196</td>
<td>-0.4814</td>
</tr>
<tr>
<td>1973</td>
<td>3</td>
<td>54</td>
<td>+0.8418</td>
<td>-0.1812</td>
</tr>
<tr>
<td>ALL FOUR YEARS</td>
<td>23</td>
<td>260</td>
<td>+1.8250</td>
<td>-0.7056</td>
</tr>
</tbody>
</table>
92.2\%, 87.1\%, 93.3\%, and 94.7\% of all forecasts studied were found to be underestimated. On a four year basis, 91.8\% of all forecasts examined were underestimated. The magnitude of these results imply that, \textit{ex post}, managerial behavior in the prospectus situation can be described as pessimistic or conservative, and that in nine out of ten cases, this behavior is manifested in an underestimated forecast. The implication of this conclusion is that the environmental considerations hypothesized in Figure 1 appear to be present in the prospectus situation and to strongly influence the behavior of management.

It can be noted in Table 8 that the observed forecasts were underestimated by as much as 182.5\% and overestimated by as much as 70.6\%, for a range of over 253\%. Furthermore, the distribution of the relative forecast error for each of the four years tended to center around a mean forecast error of 16\%; hence, forecasts were underestimated on an average of 16\%.

A question of validity of results arises with respect to the restatement of earnings prior to accounting changes; that is, what results would have been obtained if accounting changes had not been considered in the determination of the relative forecast error. Table 9 presents the results of an analysis of overestimation and underestimation utilizing a relative forecast error unadjusted for accounting changes. The results of Table 9 suggest a conclusion stronger than that suggested by Table 8. In 1970, over 94.1\% of all sample forecasts were underestimated; in 1971, approximately 88.6\% were underestimated; in 1972, 95.2\% were underestimated; and in 1973, 96.5\% were underestimated. On a four year basis, over 93.6\% of all sample forecasts were underestimated. The results of
Table 9: Results of the Analysis of Overestimated and Underestimated Forecasts Utilizing Unadjusted Relative Forecast Error

<table>
<thead>
<tr>
<th>Year</th>
<th>Incidence of Forecasts</th>
<th>Range of Relative Forecast Error</th>
<th>Distribution of Relative Forecast Error</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Overestimation</td>
<td>Underestimation</td>
<td>Maximum</td>
</tr>
<tr>
<td>1970</td>
<td>3</td>
<td>48</td>
<td>+0.8370</td>
</tr>
<tr>
<td>1971</td>
<td>8</td>
<td>62</td>
<td>+1.8250</td>
</tr>
<tr>
<td>1972</td>
<td>5</td>
<td>100</td>
<td>+1.0196</td>
</tr>
<tr>
<td>1973</td>
<td>2</td>
<td>55</td>
<td>+1.0097</td>
</tr>
<tr>
<td>ALL FOUR YEARS</td>
<td>18</td>
<td>265</td>
<td>+1.8250</td>
</tr>
</tbody>
</table>
the analysis utilizing the unadjusted relative forecast error more than confirm the previously reached conclusion that, ex post, managerial behavior in the prospectus situation can be described as pessimistic, and in more than 90% of the cases, the behavior resulted in an underestimated forecast.

The range and distribution statistics of the unadjusted relative forecast error are similar to those of the adjusted forecast error. Unadjusted forecasts were understated by as much as 182.5% and overstated by as much as 69.1%. The means of the yearly distributions also tended to center around 16%; the measures of standard deviation of the unadjusted distribution also closely approximated those of the adjusted distribution. In short, the distributions were remarkably similar, suggesting that any conclusions drawn on the distribution of adjusted forecast errors would also be applicable to the distribution of unadjusted forecast errors.

Table 8 indicates that with little exception there was a definite tendency to underestimate earnings forecasts in the sample studied. It may be recalled, however, that Dev and Webb presented arguments suggesting that there was a strong impetus for forecasts to be accurate. Accordingly, their argument imples that there should be neither a tendency toward overestimation nor to underestimation, and hence an equal number of occurrences in each category should be anticipated.

The hypothesis that the frequency of occurrence of overestimated and underestimated forecasts should be the same was tested by means of the Binomial One-Sample Test. The Binomial test is appropriate because the data is grouped into two discrete categories: overestimation and

---

4Wolfe and Hollander, pp. 15-22; Siegel, pp. 36-42.
underestimation. In none of the sample observations was the forecast exactly achieved. If exact estimations had been found, they would have been added to the overestimation category; this action would tend to make the test more stringent considering that Dev and Webb have previously found a tendency toward underestimation.

To operationalize this hypothesis it is presumed that the expected frequency of overestimated forecasts \( (P_1) \) is exactly equal to the expected frequency of underestimated forecasts \( (P_2) \); hence,

\[
H_0: \quad P_1 = P_2 = .5
\]

\[
H_A: \quad P_1 < P_2
\]

As a sample population increases above 25, the binomial distribution tends toward the normal distribution and therefore \( H_0 \) may be tested by computing a \( Z \) statistic:

\[
Z = \frac{X - \mu_X}{\sigma_X} = \frac{X - NP}{\sqrt{NPQ}}
\]

where

\[
X = \text{the smaller frequency of the two discrete categories}
\]

\[
N = \text{total sample size}
\]

\[
P = \text{probability of occurrence in category one (} P_1 \text{)}
\]

\[
Q = \text{probability of occurrence in category two (} P_2 \text{)}
\]

\[
Z \sim \mathcal{N}(0,1)
\]

This approximation by the normal distribution can be improved by making a correction for continuity. Such a correction is appropriate because the binomial distribution involves a discrete variable while the normal
distribution involves a continuous variable. Correcting for continuity, Z becomes:

\[ Z = \frac{(X + .5) - NP}{\sqrt{NPQ}} \], where \( Z \sim N(0,1) \)

The Binomial test was performed on the results of each year and of the entire four year period. The results of this test are presented in Table 10.

**Table 10: Results of The Binomial One-Sample Test of The Frequency of Overestimation and Underestimation**

<table>
<thead>
<tr>
<th>Period</th>
<th>Computed Z</th>
<th>Critical Z at ( p = .01 )</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
<td>-5.8811</td>
<td>-2.326</td>
<td>Reject ( H_0 ), and Accept ( H_A )</td>
</tr>
<tr>
<td>1971</td>
<td>-6.0956</td>
<td>-2.326</td>
<td>Reject ( H_0 ), and Accept ( H_A )</td>
</tr>
<tr>
<td>1972</td>
<td>-8.7832</td>
<td>-2.326</td>
<td>Reject ( H_0 ), and Accept ( H_A )</td>
</tr>
<tr>
<td>1973</td>
<td>-6.6226</td>
<td>-2.326</td>
<td>Reject ( H_0 ), and Accept ( H_A )</td>
</tr>
<tr>
<td>ALL FOUR YEARS</td>
<td>-14.064</td>
<td>-2.326</td>
<td>Reject ( H_0 ), and Accept ( H_A )</td>
</tr>
</tbody>
</table>

In every case the probability is less than one percent that the observed frequencies could have occurred if the actual frequency was 0.5 for each category. Consequently, the decision in every case is to reject the null hypothesis and accept the alternative that the probability of occurrence of an overestimated forecast is less than the probability of occurrence of an underestimated forecast. It is noteworthy that in each year the probability of observing the computed Z statistic is less than \( p = 0.00003 \).
One implication of the results of this test concerns the symmetry of the loss function attributed to management. It has been assumed for theory development purposes that managers possess a symmetric loss function with respect to forecast deviations; that is, that managers would attach equal weightings to overestimations and underestimations of equal magnitude. Consequently, it has been implicitly assumed that managers will behave in a consistent manner under conditions of either overestimation or underestimation. The finding that the probability of occurrence of an underestimated forecasts exceeds the probability of occurrence of an overestimated forecast suggests the contrary. The implication of this finding is obviously that the management loss function is more heavily weighted on the downside, i.e., not achieving the forecast. If this inference is correct, then management cannot be expected to behave consistently under conditions of overestimation or underestimation. From a behavioral standpoint, the logical extension of this finding of asymmetry is to infer that managerial behavior in the prospectus forecast situation can be described as pessimistic, resulting in the underestimation of anticipated results.

The results of Table 8 may be utilized to test the hypothesis, suggested by Ijiri,\(^5\) that estimation behavior in the forecasting process may be correlated with the aggregate strength of the stock market; that is, a high, positive correlation is hypothesized to exist between estimation behavior and the aggregate strength of the stock market. There are certain obvious factors to be considered by management in the forecasting process;\(^6\) for example, there is the economic and

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\(^5\)Ijiri, p. 167

\(^6\)Kearney, Inc. and Sidney & Austin, p. 86:
political climate, possible legislation by home and foreign governments, competition from other industries, competition from within the industry, specific events, and the availability of resources. This hypothesis, however, suggests that the preeminent factor to be considered is the strength of the stock market because by some unspecified theory, the market can be viewed as the barometer of the above factors and, hence, of the economic success of the firm.

To increase the precision of the "unspecified" theory underlying this hypothesis, the following definitions were utilized: 7

"Bull" Market: an advancing market; a market in which the primary trend or direction of security or commodity prices is upward with successive highs going above previous highs and successive reactions falling short of previous lows.

"Bear" Market: a falling market; a market in which the primary trend or direction of security or commodity prices is downward, with successive rallies falling short of previous highs and successive low points falling below previous lows.

The "bearishness" and "bullishness" of the British stock market were measured by a 200 day average (computed on the 200 days immediately preceding the date the prospectus was issued) of The Financial Times All-Share Index, an index of 651 stocks on The London Stock Exchange. This measure was then correlated with the relative forecast error for each firm by means of the Kendall Rank Correlation Statistic. 8

The Kendall Rank Correlation statistic is an appropriate approach


8 Wolfe and Hollander, loc. cit.; Siegel, loc. cit.
because both the relative forecast error and the aggregate strength of
the market measure are interval measurements, and therefore each firm
can be assigned a rank on both of these variables. The Kendall $\hat{\tau}$ yields
a measure of the degree of association or correlation between the two
sets of ranks. An interpretable estimator of $\hat{\tau}$, based on the Kendall
statistic $K$, is defined as:

$$\hat{\tau} = \frac{2K}{n(n-1)}, \text{ where } K = \text{Kendall Statistic}$$

$$n = \text{number of observations}$$

The Kendall Correlation Coefficient was computed for each of the four
study years and for all four years taken together. The results are
presented in Table 11.\(^9\)

**Table 11: Results of The Kendall Rank Correlation Coefficient For
The Relative Forecast Error and The Aggregate Strength of The Market**

<table>
<thead>
<tr>
<th>Year</th>
<th>$\hat{\tau}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
<td>-0.1835*</td>
</tr>
<tr>
<td>1971</td>
<td>0.0600</td>
</tr>
<tr>
<td>1972</td>
<td>-0.0430</td>
</tr>
<tr>
<td>1973</td>
<td>-0.0796</td>
</tr>
<tr>
<td>ALL FOUR YEARS</td>
<td>-0.0170</td>
</tr>
</tbody>
</table>

*significant at level of probability less than 0.05.

\(^9\)The correlation coefficient was also computed using a relative
forecast error unadjusted for accounting changes:

<table>
<thead>
<tr>
<th>Year</th>
<th>$\hat{\tau}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
<td>-0.2078* (significant)</td>
</tr>
<tr>
<td>1971</td>
<td>0.0981</td>
</tr>
<tr>
<td>1972</td>
<td>-0.0353</td>
</tr>
<tr>
<td>1973</td>
<td>-0.0332</td>
</tr>
<tr>
<td>ALL FOUR YEARS</td>
<td>0.0034</td>
</tr>
</tbody>
</table>

Again, 1970 is the only year with significant results, i.e. that the
probability that this result would occur by chance is less than 0.05.
As the total sample size increases above $N = 8$, the sampling distribution of $\hat{\tau}$ closely approximates the normal distribution. Consequently, for large samples the normal curve table may be utilized to determine the probability associated with the occurrence of any value as extreme as the observed $\hat{\tau}$. The statistic computed was:

$$Z = \frac{\hat{\tau} - \mu_{\hat{\tau}}}{\sigma_{\hat{\tau}}} = \sqrt{\frac{2(2N+1)}{9N(N-1)}}$$

$Z \sim N(0,1)$

Table II indicates that 1970 was the only year in which $\hat{\tau}$ was significant i.e. the probability that such a value of $\hat{\tau}$ would occur by chance is less than 0.05.

The Ijiri hypothesis may be tested in an alternative manner. According to Stewarts, the size of overestimation in forecasting may be correlated with market performance, while no such correlation need exist for the size of underestimation. This result suggests that the hypothesis should be segmented and tested as two distinct hypotheses: (1) the size of overestimation is correlated with market performance, and (2) the size of underestimation is correlated with market performance. To test these hypotheses, the sample of relative forecast errors was segmented into two groups, overestimation and underestimation. As in the initial test, the forecast errors were correlated with the measure of the market strength utilizing the Kendall Rank Correlation method. This analysis was only conducted for the total four year sample because on a yearly basis the sample sizes of overestimated forecasts were too small. Consistent with Stewart's findings, the correlation between the size of overestimation and market strength was positive ($\hat{\tau} = 0.2174$) and significant at a level of probability less than 0.07; the correlation between the size of underestimation and market strength was neither positive ($\hat{\tau} = -0.0342$) nor significant.
The results of Table 11 suggest that there is very little relationship between the aggregate strength of the stock market and the relative forecast errors of the subpopulation studied. Noteworthy is the observation that for the slight relationship that did exist, it tended to be negative (in three of the four years and in all four years taken together), which basically supports the Ijiri hypothesis in the manner tested.

Given the overwhelming incidence of underestimated forecasts, management apparently underestimated their prospectus forecasts during periods of both advancing and falling markets. This finding is important in that it suggests that the environmental considerations of Figure 1 that tend to result in an underestimated forecast were apparently the primary considerations influencing the bulk of the forecasting managers. The conclusion to be drawn from these results is: managerial behavior in the prospectus situation is not primarily guided by the aggregate strength of the stock market.

Analysis of the Coefficient of Skewness

A distribution is said to be "skewed" when two conditions are present:10 (1) the mean and the median fall at different points in the distribution and (2) the balance or center of gravity of the distribution is shifted to one side. For a symmetrical distribution, e.g. the normal distribution, the mean exactly equals the median and there is zero skewness. For distributions with a "fat" or extended right tail, skewness is

10Garrett, p. 100.
said to be positive; for distributions with a fat or extended left tail, skewness is said to be negative.

Skewness can be measured by a coefficient defined by the following expression:

\[
\text{Coefficient of Skewness} = \frac{E((X-\mu)^3)}{E((X-\mu)^2)^{3/2}} = \frac{\mu_3}{\sigma_3^3}
\]

where \( \mu_3 = \) the third moment about the mean
\( \sigma = \) standard deviation.

The coefficient of skewness can be utilized to further illuminate the tendency of management to overestimate or underestimate forecasts. Recall that in this study, a non-normal distribution with a long tail in the positive direction was hypothesized.

Table 8 presents the results of the coefficient of skewness, which are reproduced below:

<table>
<thead>
<tr>
<th>Year</th>
<th>Coefficient of Skewness</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
<td>1.1127</td>
</tr>
<tr>
<td>1971</td>
<td>1.4715</td>
</tr>
<tr>
<td>1972</td>
<td>1.3454</td>
</tr>
<tr>
<td>1973</td>
<td>1.7254</td>
</tr>
<tr>
<td>ALL FOUR YEARS</td>
<td>1.5694</td>
</tr>
</tbody>
</table>

In each case, a large, positive coefficient is found, confirming the hypothesis that a definite trend of underestimation would be found. This finding is also meaningful from the standpoint of the normality of the distribution of relative forecast errors. The size of the obtained coefficients is sufficient to conclude that the distributions of the relative forecast error are definitely non-normal. This conclusion justifies the use of nonparametric statistics in this study.

The findings concerning the coefficient of skewness may be visually
Figure 4: Histogram of the Relative Forecast Error: 1971
Figure 5: Histogram of the Relative Forecast Error: 1972
Figure 6: Histogram of the Relative Forecast Error: 1973
verified by examining the histograms for the distribution of relative forecast errors in Figures 3 through 7. It can be observed that the distributions are non-normal and skewed in a positive direction.

These findings confirm the conclusion, based on earlier results, that managerial behavior in the prospectus situation appears to be conservative and tends to result in the underestimation of forecasted earnings.

Analysis of the Relative Forecast Error Distributed By Industry Classification

An examination of overestimation and underestimation by industry classification appears desirable given the findings by Dev and Webb, Daily, and the FAF, that the level of forecast accuracy varied according to industry groupings. To illuminate any relationship between the variables, the means of the relative forecast error distributed by industry classification were calculated and the results presented in Table 12.

Table 12: Means of the Relative Forecast Error Distributed by Industry Classification

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Banks and Hire Purchase</td>
<td>0.1983</td>
<td>0.2052</td>
<td>-0.0640</td>
<td>-0.0065</td>
</tr>
<tr>
<td>Beers, Wines, and Spirits</td>
<td>0.0551</td>
<td>0.1068</td>
<td>0.1365</td>
<td>0.2013</td>
</tr>
<tr>
<td>Building Industry, Timber and Roads</td>
<td>N.A.</td>
<td>0.1878</td>
<td>0.2637</td>
<td>0.0808*</td>
</tr>
<tr>
<td>Chemicals, Plastics, etc.</td>
<td>0.3573</td>
<td>0.0828</td>
<td>-0.0713</td>
<td>0.6301</td>
</tr>
<tr>
<td>Cinemas, Theatres, and T.V.</td>
<td>0.9025</td>
<td>-0.3698</td>
<td>N.A.</td>
<td>N.A.</td>
</tr>
<tr>
<td>Drapery and Stores</td>
<td>-0.0976</td>
<td>0.0786</td>
<td>0.1983*</td>
<td>0.0583</td>
</tr>
<tr>
<td>Electrical and Radio</td>
<td>0.0189</td>
<td>0.9522</td>
<td>-0.0015*</td>
<td>0.1701*</td>
</tr>
<tr>
<td>Engineering and Metal</td>
<td>0.1021*</td>
<td>0.0671*</td>
<td>0.2008*</td>
<td>0.1214</td>
</tr>
<tr>
<td>Food, Groceries, etc.</td>
<td>0.0861</td>
<td>0.1636</td>
<td>0.0941*</td>
<td>0.1056</td>
</tr>
<tr>
<td>Hotels and Caterers</td>
<td>0.0591</td>
<td>N.A.</td>
<td>0.1161</td>
<td>0.0825</td>
</tr>
<tr>
<td>Miscellaneous Industrials</td>
<td>0.2021*</td>
<td>0.2422*</td>
<td>0.2146*</td>
<td>0.1230*</td>
</tr>
<tr>
<td>Motors, Aircraft trades</td>
<td>N.A.</td>
<td>-0.0167*</td>
<td>0.0479</td>
<td>0.1013</td>
</tr>
<tr>
<td>Newspapers, Publishers</td>
<td>N.A.</td>
<td>0.2765</td>
<td>0.0944</td>
<td>N.A.</td>
</tr>
<tr>
<td>Paper, Printing, Advertising</td>
<td>0.0424</td>
<td>N.A.</td>
<td>-0.0025</td>
<td>0.3364*</td>
</tr>
<tr>
<td>Property</td>
<td>N.A.</td>
<td>0.2237</td>
<td>0.1916*</td>
<td>0.0625*</td>
</tr>
<tr>
<td>Textiles</td>
<td>0.3796</td>
<td>0.2019</td>
<td>0.1104</td>
<td>0.1673</td>
</tr>
<tr>
<td>Trusts, Finance, Land</td>
<td>0.1599</td>
<td>0.0870*</td>
<td>0.1158*</td>
<td>0.0926</td>
</tr>
</tbody>
</table>

* Indicates 5 or more observations
N.A. indicates the absence of observations in the sample
A caveat must be issued with respect to the results of Table 12. As the asterisks in Table 12 indicate, only 20 of the 68 individual categories contain approximately five or more observations for any particular year. The non-asterisked categories contain too few observations to draw meaningful inferences. Therefore, some reservation should be held concerning conclusions reached on the basis of Table 12.

Of the twenty categories containing five or more observations, at least two fall within each of the following industrial classifications: (1) Building Industry, Timber and Roads, (2) Engineering and Metal, (3) Miscellaneous Industrials, (4) Property, and (5) Trusts, Finance, and Land. The Building Industry consistently underestimated forecasted earnings on the average of 19.08%. The Engineering and Metal industry also consistently underestimated their results, but only on the average of 13.24%. Since the Miscellaneous Industrials classification has a sufficiently large sample in each of the four years, the results are perhaps the most reliable; on the basis of 85 observations, the forecast was consistently underestimated on an average of 19.73%. The Property investment and development industry and the Trusts, Finance, and Land industries underestimated their results by an average of 15.93% and 10.25% respectively.

On the basis of these 20 interpretable categories, three observations are apparent: (1) forecasts were consistently underestimated; (2) Miscellaneous industrials tended to underestimate their results by the greatest percentage; and (3) the average range of underestimation was 6 to 33%.

Of interest is the frequency of overestimated and underestimated
forecasts by industry classification. Table 13 provides the results of a tabulation of overestimated forecasts according to industry classification. The widely dispersed incidence of overestimated forecasts suggests that no relationship exists between industry classification and the tendency to overestimate forecasts.

Table 13: Frequency of Overestimated Forecasts Distributed By Industrial Classification

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Banks and Hire Purchase</td>
<td></td>
<td></td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Beers, Wines, and Spirits</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Building Industry, Timber and Roads</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chemicals, Plastics, etc.</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cinemas, Theatres, and T.V.</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drapery and Stores</td>
<td></td>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Electrical and Radio</td>
<td>1</td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Engineering and Metal</td>
<td></td>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Food, Groceries, etc.</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Hotels and Caterers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Miscellaneous Industrials</td>
<td></td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Motors, Aircraft trades</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Newspapers, Publishers</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Paper, Printing, Advertising</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Property</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Textiles</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Trusts, Finance, Land</td>
<td>1</td>
<td></td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

The null hypothesis that there is no relationship between industry classification and overestimation or underestimation of earnings forecasts was statistically tested by means of the Kruskal-Wallis test.\(^{11}\)

\[ H_0: \ T_1 = T_2 = T_3 = \ldots = T_k, \text{ where } k = \text{industry classification} \]

\[ T = \text{treatment (i.e. industrial classification)} \]

\[ H_A: \text{the T's are not all equal.} \]

\(^{11}\)Wolfe and Hollander, p. 115.
Table 3 (under "Description of Sample") indicates that in some years certain industries were not represented in the sample, i.e. there were no observations for that particular industry. Therefore, the number of industry classifications varied between years. To insure that the results of the Kruskal-Wallis test were comparable between the years, the 17 industrial classifications were reduced to 10:

1. Miscellaneous Industrials; Chemicals, Plastics, etc.; Motor, Aircraft trades.
2. Hotels and Caterers; Food, Groceries, etc.; Beers, Wines, and Spirits; Cinemas, Theatres, and T.V.
3. Engineering and Metal
7. Drapery and Stores
8. Electrical and Radio
9. Textiles
10. Property

In cases of large samples, the Kruskal-Wallis statistic $H$ has an $\chi^2$ distribution with $k-1$ degrees of freedom. The appropriate test is:

reject $H_0$ if $H \geq \chi^2(k-1, \alpha)$

accept $H_0$ if $H < \chi^2(k-1, \alpha)$

The results of the Kruskal-Wallis test are presented in Table 14.

<table>
<thead>
<tr>
<th>Year</th>
<th>Computed Value of $H$</th>
<th>Decision $\alpha=0.05$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
<td>14.485</td>
<td>accept $H_0$</td>
</tr>
<tr>
<td>1971</td>
<td>7.012</td>
<td>accept $H_0$</td>
</tr>
<tr>
<td>1972</td>
<td>10.552</td>
<td>accept $H_0$</td>
</tr>
<tr>
<td>1973</td>
<td>4.813</td>
<td>accept $H_0$</td>
</tr>
</tbody>
</table>
In each year the null hypothesis was accepted. Consequently it can be concluded that there is no significant relationship between industrial classification and the overestimation and underestimation of earnings forecasts in prospectuses. Had the null hypothesis been rejected, a Multiple Comparisons Procedure would have been applied to determine exactly which of the industrial classifications were different; this procedure was not undertaken.

Analysis of The Relative Forecast Error Distributed by Size Classification

A relationship can be hypothesized to exist between firm size and accuracy in forecasting. As size increases, then presumably the resources available to be utilized for forecasting also increase. In larger firms, a greater number of personnel utilizing more sophisticated forecasting techniques would be expected. In smaller firms, where resources might not be so plentiful, less attention to the forecasting process would be expected. To examine for such a relationship, Table 15 displays the means of the relative forecast error distributed by firm size, where size is defined as average total assets. Table 15 does not immediately suggest any particular relationship between the relative forecast error and firm size. This fact is readily apparent by visually examining Figure 8, the graphs of the mean of the relative forecast error plotted against the size classifications. While no specific relationship is apparent, several observations can be made: (1) the mean of the relative forecast error is positive for every size classification, indicating consistent underestimation at all size levels; (2) forecasting is
most consistent in the extreme size classifications: firms under 
$1,000,000$ had a mean error range of $0.69\%$ and firms above $20,000,000$ 
had a mean error range of $4.76\%$; (3) the greatest variability in fore-
casting occurred in the middle size classes: classes 3 through 7 had 
mean error ranges of $13.82\%, 7.49\%, 21.44\%, 31.16\%, \text{and} 22.52\%$ respec-
tively; (4) the limits of the range of the mean forecast error over all 
sizes and all years was $1.25\% \text{to} 39.39\%$ underestimated.

Table 15: Means of the Relative Forecast Error
Distributed by Firm Size

<table>
<thead>
<tr>
<th>Size Classification (Average Total Assets)</th>
<th>1970</th>
<th>1971</th>
<th>1972</th>
<th>1973</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under $\leq 1,000,000$</td>
<td>0.1366</td>
<td>0.1313</td>
<td>0.1320</td>
<td>0.1382</td>
</tr>
<tr>
<td>To $\leq 2,000,000$</td>
<td>0.1285</td>
<td>0.1959</td>
<td>0.2007</td>
<td>0.1578</td>
</tr>
<tr>
<td>To $\leq 3,000,000$</td>
<td>0.2541</td>
<td>0.1440*</td>
<td>0.1365</td>
<td>0.1159</td>
</tr>
<tr>
<td>To $\leq 4,000,000$</td>
<td>0.1074*</td>
<td>0.1610</td>
<td>0.1823</td>
<td>0.1308</td>
</tr>
<tr>
<td>To $\leq 7,000,000$</td>
<td>0.1359*</td>
<td>0.3302</td>
<td>0.1158</td>
<td>0.1518</td>
</tr>
<tr>
<td>To $\leq 10,000,000$</td>
<td>0.3623*</td>
<td>0.0833</td>
<td>0.2337</td>
<td>0.0507*</td>
</tr>
<tr>
<td>To $\leq 20,000,000$</td>
<td>0.2237</td>
<td>0.1805</td>
<td>0.3939</td>
<td>0.1697*</td>
</tr>
<tr>
<td>Above $\geq 20,000,000$</td>
<td>0.0601*</td>
<td>0.0162</td>
<td>0.0304</td>
<td>0.0125</td>
</tr>
</tbody>
</table>

* indicates less than $5$ observations

The implication of these observations is that while managers in 
firms of all sizes apparently underestimate their forecasts, the behavior 
of the managers in the smallest and largest firms is most consistent.

The hypothesis that firm size is correlated with overestimation or 
underestimation of the forecast was statistically tested utilizing the 
Kendall Rank Correlation method. Firm size, defined as average total 
assets, was correlated with the relative forecast error. The results of 
the test are presented in Table 16. Table 16 confirms the conclusion 
that the relationship between firm size and the relative forecast error 
is neither significant nor consistent; two of the four correlations differ
in sign and only one correlation coefficient, 1973, was significant at a probability of less than 0.10. In order to substantiate whether a relationship may exist between firm size and the magnitude of the forecast error, a second test was conducted correlating size with the absolute value of the relative forecast error; the results were slightly worse: none of the correlations were significant, even at a probability of 0.10.

Table 16: Results of the Kendall Rank Correlation Coefficient For the Relative Forecast Error and Firm Size.

<table>
<thead>
<tr>
<th>Year</th>
<th>τ</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
<td>0.0431</td>
</tr>
<tr>
<td>1971</td>
<td>-0.0534</td>
</tr>
<tr>
<td>1972</td>
<td>0.0179</td>
</tr>
<tr>
<td>1973</td>
<td>-0.1378*</td>
</tr>
<tr>
<td>ALL FOUR YEARS</td>
<td>-0.0248</td>
</tr>
</tbody>
</table>

*significant at a probability of 0.07.

Allowing for the possibility that the definition of size (average total assets) may have been incorrect, the hypothesis was retested utilizing size defined as (1) current year revenues and (2) current year earnings. With respect to revenues, the results were again inconsistent and insignificant. With respect to earnings, the results were more significant. In three cases, 1972, 1973, and all four years taken together, the Kendall τ was significant at a probability of less than 0.10.

Data Analysis of Managerial Behavior Subsequent to the Forecast: The Annual Statement of Accounts

According to proposition one of the theory of forecast-deviation
minimization, the managers of forecasting firms will be motivated to 
insure that actual reported results fall within some accepted range of 
values around the forecast. When actual results deviate from the zone 
of acceptable values, accounting procedures may be implemented to mini-
mize the deviation. The use of accounting procedures in this manner was 
labelled "artificial" in Chapter Two. The purpose of the current section 
is to determine, by analyzing the annual statement of accounts, whether 
the management of the forecasting firms utilized artificial responses in 
a manner consistent with proposition one.

In order to test this proposition a quantitative measure of the zone of 
acceptance was developed from the questionnaire results. The 31 firms 
completing the questionnaire were requested to indicate an acceptable 
range of values for their own firms (see question 4, section A, and 
questions 14 and 18, section B). The median value of these responses 
was taken to represent the zone of acceptable values for all other firms 
in the sample. The questionnaire responses to the zone of acceptance are 
displayed in Table 17.

Table 17: Distribution of the Zone of Acceptance

<table>
<thead>
<tr>
<th>Acceptable Zone Above The Forecast</th>
<th>Acceptable Zone Below The Forecast</th>
</tr>
</thead>
<tbody>
<tr>
<td>Numerical Response</td>
<td>Frequency of Response</td>
</tr>
<tr>
<td>----------------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td>33.3%</td>
<td>1</td>
</tr>
<tr>
<td>12.0</td>
<td>1</td>
</tr>
<tr>
<td>10.0</td>
<td>11</td>
</tr>
<tr>
<td>8.0</td>
<td>1</td>
</tr>
<tr>
<td>7.0</td>
<td>1</td>
</tr>
<tr>
<td>5.0</td>
<td>13</td>
</tr>
<tr>
<td>2.5</td>
<td>1</td>
</tr>
<tr>
<td>2.0</td>
<td>1</td>
</tr>
<tr>
<td>1.0</td>
<td>1</td>
</tr>
</tbody>
</table>

| Total                | 31                    | Total                | 31                    |
The range of the responses was 43.3%, from 33.3% above the forecast to 10% below. The mean response was 7.77% above and 1.7% below. The median response, i.e. the zone of acceptance, was 5% above the forecast and 0% below.

One implication of the median zone of acceptance of 0 to 5% is that both forecast type one ("profits will be \( \mathbf{X} \)") and type two ("profits will be at least \( \mathbf{X} \)") are operationally interpreted as "profits will be at least \( \mathbf{X} \), but no more than \( \mathbf{X} + .05X \)." This interpretation suggests an important behavioral point; that is, in the case of prospectuses for the issue of capital, the stated forecast is actually meant to represent only the lower boundary of the distribution of probable actual results. Consequently, while in fact using a point estimate of the actual results, managers behave as if the forecast were a lower boundary of a probability distribution.

For the 31 firms completing the questionnaire, the zone of acceptable values reported in the questionnaire was utilized; for the remaining 252 observations the median zone was utilized.

The success of the approach in generating a zone can be evaluated in part by examining the distribution of actual forecast errors. Considering the total sample of 283 observations, only 22.9% reported results falling within the median zone of acceptance. If the limits of the zone are extended to 10% above and 0% below, 19.8% more observations would fall within the zone, for a cumulative total of 42.7%. Extending the zone to 15% above and 0% below adds 12.4% more observations, totalling 55.1%; and, increasing the zone to 20% above and 0% below would add another 6.4%, for a cumulative total of 61.5% of the observations falling within the zone.
of acceptance. The median zone thus appears to be relatively "tight" in
that only 1/5 of all firms "successfully" forecasted results within the
hypothetical range of acceptable values. These actual results, however,
cannot be used to generate a zone for data analysis purposes; it is not
possible to determine the extent to which the reported results have been
influenced by managerial discretionary actions ("real" responses)
associated with the forecast disclosure situation.

After establishing the zone of acceptance, the total subpopulation
was examined for observations supporting proposition one, i.e., results
within either the median or reported zone of acceptance. Of the 283
observations, only 70 firms reported results within the zone of acceptance.
Consequently, only 24.7% of the total subpopulation reported results that
tended to confirm proposition one. Everyone of the 70 observations was
an underestimated forecast. The 70 observations are distributed accord-
ing to industrial classification in Table 18 and according to firm size
in Table 19. The tables indicate a large incidence of small firms (44.3%),
i.e. "under $2,000,000," and industrial firms (37.1%), i.e. "Miscellaneous
Industrials," among those firms tending to confirm proposition one.
Table 18: Distribution of Firms Confirming Proposition One by Industrial Classification

<table>
<thead>
<tr>
<th>Industrial Classification</th>
<th>1970</th>
<th>1971</th>
<th>1972</th>
<th>1973</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Banks and Hire Purchase</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Beers, Wines, and Spirits</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Building Industry, Timber and Roads</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>Chemicals, Plastics, etc.</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Cinemas, Theatres, and T.V.</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Drapery and Stores</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Electrical and Radio</td>
<td>2</td>
<td>0</td>
<td>3</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>Engineering and Metal</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Food, Groceries, etc.</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Hotels and Caterers</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Miscellaneous Industrials</td>
<td>4</td>
<td>5</td>
<td>10</td>
<td>7</td>
<td>26</td>
</tr>
<tr>
<td>Motors, Aircraft trades</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Newspapers, Publishers</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Paper, Printing, Advertising</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Property</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Textiles</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Trusts, Finance, Land</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td><strong>TOTALS</strong></td>
<td>12</td>
<td>13</td>
<td>27</td>
<td>18</td>
<td>78</td>
</tr>
</tbody>
</table>

Table 19: Distribution of Firms Confirming Proposition One by Firm Size

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Under £ 1,000,000</td>
<td>5</td>
<td>3</td>
<td>5</td>
<td>1</td>
<td>14</td>
</tr>
<tr>
<td>To £ 2,000,000</td>
<td>3</td>
<td>3</td>
<td>8</td>
<td>3</td>
<td>17</td>
</tr>
<tr>
<td>To £ 3,000,000</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>To £ 4,000,000</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>To £ 7,000,000</td>
<td>1</td>
<td>0</td>
<td>6</td>
<td>4</td>
<td>11</td>
</tr>
<tr>
<td>To £ 10,000,000</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>To £ 20,000,000</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Above £ 20,000,000</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>12</td>
<td>13</td>
<td>27</td>
<td>18</td>
<td>70</td>
</tr>
</tbody>
</table>

The total sample was then segmented according to whether or not accounting adjustments were present. During the years 1970 through 1973 17.6% (9 firms), 20.0% (14 firms), 21.9% (23 firms), and 15.8% (9 firms), respectively, of the sample firms experienced accounting adjustments. Table 20 displays the types and frequency of accounting adjustments present in the sample results.
Of the 55 firms experiencing accounting adjustments, only seven cases confirming proposition one were found. The types of accounting adjustments present in the seven cases were: (1) change in the method of depreciation (3 cases), (2) change in the method of inventory valuation, (3) change in the method of accounting for investment grants, (4) treatment of loss on the sale of inventory, and (5) treatment of director compensation items. Three of these adjustments had the effect of raising reported profit from below the zone of acceptance to within it; the remaining four resulted in a reduction of reported profit from above to within the zone. The incidence of these supporting observations was:

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Observations Confirming Proposition One</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
<td>1</td>
</tr>
<tr>
<td>1971</td>
<td>2</td>
</tr>
<tr>
<td>1972</td>
<td>3</td>
</tr>
<tr>
<td>1973</td>
<td>1/7</td>
</tr>
</tbody>
</table>

Further, no relationship was found to exist between the seven observations and either industrial classification\textsuperscript{12} or size classification\textsuperscript{13}.

\textsuperscript{12}Six industrial classifications are represented: (1) Beers, Wines, and Spirits, (2) Building Industry, Timber and Roads, (3) Drapery and Stores, (4) Food, Groceries, etc. (2 firms), (5) Motor, Aircraft trades, and (6) Paper, Printing, and Advertising.

\textsuperscript{13}Five size classifications are represented: (1) Under £1,000,000, (2) To £2,000,000 (2 firms), (3) To £4,000,000, (4) To £10,000,000, and (5) To £20,000,000 (2 firms).
Table 20: Types of Accounting Adjustments

<table>
<thead>
<tr>
<th>Type of Adjustment</th>
<th>Frequency of Occurrence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1970 (9 Firms)</td>
</tr>
<tr>
<td>1. Change in method of depreciation and/or estimated useful life of assets</td>
<td>1</td>
</tr>
<tr>
<td>2. Change in method of depreciation in subsidiaries</td>
<td>1</td>
</tr>
<tr>
<td>3. Change in method of inventory valuation</td>
<td></td>
</tr>
<tr>
<td>4. Change in basis of accounting for income</td>
<td>1</td>
</tr>
<tr>
<td>5. Change in consolidated accounting method</td>
<td>1</td>
</tr>
<tr>
<td>6. Change in capitalization of assets policy</td>
<td>1</td>
</tr>
<tr>
<td>7. Change in method of accounting for interest</td>
<td></td>
</tr>
<tr>
<td>8. Change in method of accounting for investment grants</td>
<td>2</td>
</tr>
<tr>
<td>9. Change in accounting for warranty repairs, sales returns, and discounts allowed</td>
<td>1</td>
</tr>
<tr>
<td>10. Treatment of surplus on sale of subsidiary</td>
<td></td>
</tr>
<tr>
<td>11. Treatment of surplus on sale of investments</td>
<td>2</td>
</tr>
<tr>
<td>12. Treatment of surplus on sale of marketable securities</td>
<td></td>
</tr>
<tr>
<td>13. Treatment of surplus on sale of fixed assets</td>
<td>3</td>
</tr>
<tr>
<td>14. Treatment of loss on sale of fixed assets</td>
<td></td>
</tr>
<tr>
<td>15. Treatment of surplus on redemption of loan stock</td>
<td></td>
</tr>
<tr>
<td>16. Treatment of loss on sale of inventory</td>
<td></td>
</tr>
<tr>
<td>17. Treatment of surplus on assets resulting from revaluation of exchange rates</td>
<td></td>
</tr>
<tr>
<td>18. Treatment of fixed asset write-off</td>
<td></td>
</tr>
<tr>
<td>19. Treatment of provision write-off</td>
<td></td>
</tr>
<tr>
<td>20. Treatment of insurance proceeds</td>
<td></td>
</tr>
<tr>
<td>21. Treatment of director compensation items</td>
<td></td>
</tr>
</tbody>
</table>
Of the total sample, only 70 firms reported results falling within the zone of acceptance. Of the 70 firms, only seven, or 10%, appeared to report results within the zone as a consequence of artificial responses. These findings suggest that proposition one, viewed only from the standpoint of artificial behavioral responses, is not consistent with real world behavior.

The primary observation to be drawn from this analysis is that there was an unexpected, low incidence of accounting adjustments; only 19.4% of the total sample of firms experienced accounting adjustments. The implication of this absence of accounting adjustments is that there were very few artificial managerial responses among the sample firms. The appropriate conclusion would appear to be that management does not utilize artificial responses to reduce forecast deviations. Perhaps one reason why accounting adjustments were not more prevalent is because the use of accounting procedures is readily observable; and where such procedures are observed, there tends to be the immediate imputation that management is trying to achieve the forecast. Essentially, there may be a question of public image or integrity involved. Another possible explanation for the absence of accounting adjustments is that management is capable of sufficiently controlling operating results by the use of real responses that they have no need to revert to the use of artificial responses.

In the case of overestimated forecasts, the ability of management to control operating results by internal decisions may be somewhat lessened, possibly forcing them to utilize artificial responses. This possibility was considered by examining for a relationship between the
use of accounting adjustments and the overestimation of forecasts. Of the 23 forecasts that were not achieved, ten or 43.5% were influenced by accounting adjustments. This result is insufficient to conclude that a relationship exists between the failure to achieve the forecast and the use of accounting adjustments.

The results of the analysis of proposition one suggest a trend of behavior somewhat contrary to the proposition. Table 21 displays the percentage of forecasts falling within various zones of acceptance.

<table>
<thead>
<tr>
<th>Upper Limit of Zone of Acceptance</th>
<th>Year of Forecast</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-5%</td>
<td>21.6%</td>
</tr>
<tr>
<td>5-10%</td>
<td>25.5%</td>
</tr>
<tr>
<td>10-15%</td>
<td>11.8%</td>
</tr>
<tr>
<td>15-20%</td>
<td>9.8%</td>
</tr>
<tr>
<td>Above 20%</td>
<td>23.5%</td>
</tr>
</tbody>
</table>

In each of the four years, nearly 1/4 to 1/3 of all forecasts studied fall beyond a zone of acceptance of 20% above the forecast. One implication of this finding is that there may be no upper limit to the zone of acceptance. This inference tends to be supported by the overwhelming use of the forecast type "profits will be at least $X" (see table 5). Of the 283 forecasts examined, 244 utilized the "profits will be at least" form. Furthermore, of the 55 instances of forecasts with accounting adjustments, 46 of those cases resulted in reported earnings being increased as a consequence of the adjustment; therefore, in the majority of cases, where accounting adjustments were undertaken they resulted in an increase in reported profits.
Depending upon the results of the questionnaire analysis, it may become necessary to revise proposition one to read: management will be motivated to insure that reported results fall within an acceptable range of values, bounded only at the lower extreme by the forecast itself. The revised proposition is more consistent with the observed ex post managerial behavior.

**Data Analysis of Managerial Behavior Subsequent to the Forecast:**

**Questionnaire Survey**

The initial population of firms for the questionnaire survey numbered 70. These firms, obtained from The Financial Times newspaper, published prospectuses containing useable forecasts during the period December, 1972 through December, 1973. From the prospectus, the name and address of the managing director and financial director, when available, of each firm was obtained. In November, 1973, an initial letter of inquiry (see appendix D) was sent to this group of managers to ascertain whether or not they would be willing to participate in a questionnaire study concerning the effects of financial forecasting on managerial behavior. The letter was accompanied by a supporting letter from the dissertation chairman and a return reply post card with International Reply Coupon attached.\(^{14}\) A total of 112 letters of inquiry were mailed and 68

\(^{14}\)For this initial mailing, British postage stamps for the return correspondence were not obtained, and therefore it was necessary to utilize International Reply Coupons obtained from the U. S. Post Office. For the return mailing of the questionnaire, however, postage stamps from the appropriate foreign countries were obtained and employed.
responses were received, for a total response rate of 60.7%. Of this total return, 28 negative responses and 40 positive responses were received, yielding a positive response rate of 35.7%.

The 40 positive replies came from approximately an equal number of managing directors and financial directors. Inquiries were sent to both managing and financial directors because it was anticipated that at least one of these two individuals would have been deeply involved in the forecasting process and at least one would consent to participate in the study. In those firms where the name and address of the financial director was not available in the prospectus, the managing director often transferred the letter of inquiry to the financial director when the financial director had had more intimate experience with the forecasting process; therefore, the letter of inquiry was ultimately answered by the manager with the greatest expertise and involvement in the forecasting process.

In January, 1974, a second letter was mailed to each of the 40 respondents, informing them that the questionnaire would be sent within the next month and inquiring whether they were still interested in participating in the study. No negative responses were received in regard to this letter, and in March, 1974, the questionnaire, with covering letter (see appendix D) and self-addressed, stamped envelope, were mailed. Two follow-up letters, accompanied by additional copies of the questionnaire, were subsequently necessary to obtain the desired number of completed questionnaires.

Previous research,\textsuperscript{15} utilizing similar types of questionnaire items,

\textsuperscript{15}Fertakis, p. 67.
ascertained that 30 questionnaires was the minimum acceptable sample size. Of the 40 initial respondents, 33 completed questionnaires were received, of which 31 were utilized in the study. Five respondents simply failed to return their questionnaire; subsequently, a third follow-up letter was sent soliciting reasons why they had decided not to complete the questionnaire, but none of the five letters were answered. Two other respondents returned their questionnaires unanswered and their reasons for doing so are interesting:

Unfortunately, my time is very limited for so extensive a survey, and also this appears to be rather too confidential ... (underlining added).

Unfortunately, I am not of a mind to provide any information to you concerning my company until such time as the shareholders are in possession of not less than the same facts.

The final two respondents did return a completed questionnaire but were eliminated from the survey because their results were duplicated by another respondent from the same firm. In several firms, questionnaires had been sent to both the managing director and the financial director to insure that at least one completed questionnaire was obtained from each firm. In two of these cases both directors returned their questionnaires completed, and since the information was nearly identical, one of the questionnaires from each of the firms was omitted.

Description of Questionnaire Sample

The questionnaire survey sample is composed of 31 respondents representing 31 different firms. A listing of these firms is not provided, consistent with the agreement that the respondents would provide the necessary information on the condition that neither their name nor that
of their company be disclosed. The respondents were composed of 15
Financial Directors, 7 Managing Directors, 7 Managing Directors and
Chairman, 1 Chief Accountant, and 1 Chief Executive. The results of
question three, section A, indicated that in all but one case, the indi-
vidual completing the questionnaire had been deeply involved in the fore-
casting process. In the one case, the respondent indicated that his
involvement had been only on a limited basis, primarily final approval.

The questionnaire sample can be described from three perspectives:
(1) the type of share issue, (2) industrial classification, and (3) firm
size.

Table 22 displays the sample classified according to the type of
share issue.

Table 22: Types of Share Issues for the Questionnaire Sample

<table>
<thead>
<tr>
<th>Type of Issue</th>
<th>Number of Firms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Placing</td>
<td>7</td>
</tr>
<tr>
<td>Introduction</td>
<td>10</td>
</tr>
<tr>
<td>Offer for Sale</td>
<td>14</td>
</tr>
<tr>
<td>Offer for Sale by Tender</td>
<td>0</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>31</strong></td>
</tr>
</tbody>
</table>

In comparison with the sample for the entire study, the distribu-
tion of the 31 firms by type of share issue is relatively evenly distrib-
uted.

Table 23 provides an industrial categorization of the sample firms.
Again, this distribution is much more evenly distributed than the entire
study sample.
Table 23: Industrial Classification of the Questionnaire Sample

<table>
<thead>
<tr>
<th>Industrial Classification</th>
<th>Number of Firms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beers, Wines, and Spirits</td>
<td>1</td>
</tr>
<tr>
<td>Building industry, Timber and Roads</td>
<td>5</td>
</tr>
<tr>
<td>Chemicals, Plastics, etc.</td>
<td>1</td>
</tr>
<tr>
<td>Electrical and Radio</td>
<td>2</td>
</tr>
<tr>
<td>Engineering and Metal</td>
<td>2</td>
</tr>
<tr>
<td>Food, Groceries, etc.</td>
<td>2</td>
</tr>
<tr>
<td>Miscellaneous Industrials</td>
<td>7</td>
</tr>
<tr>
<td>Motor, Aircraft trades</td>
<td>2</td>
</tr>
<tr>
<td>Paper, Printing, Advertising</td>
<td>2</td>
</tr>
<tr>
<td>Property</td>
<td>5</td>
</tr>
<tr>
<td>Trusts, Finance, Land</td>
<td>2</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>31</strong></td>
</tr>
</tbody>
</table>

Table 24 displays the sample classified according to firm size, defined as average total assets. As in the case with the total sample, the questionnaire sample is somewhat dominated by the size category "to £2,000,000." This domination does not suggest a response bias.

Table 24: Size Classification of the Questionnaire Sample

<table>
<thead>
<tr>
<th>Average Total Assets</th>
<th>Number of Firms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under £1,000,000</td>
<td>1</td>
</tr>
<tr>
<td>To £2,000,000</td>
<td>8</td>
</tr>
<tr>
<td>To £3,000,000</td>
<td>3</td>
</tr>
<tr>
<td>To £4,000,000</td>
<td>6</td>
</tr>
<tr>
<td>To £7,000,000</td>
<td>5</td>
</tr>
<tr>
<td>To £10,000,000</td>
<td>2</td>
</tr>
<tr>
<td>To £20,000,000</td>
<td>3</td>
</tr>
<tr>
<td>Above £20,000,000</td>
<td>3</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>31</strong></td>
</tr>
</tbody>
</table>

A Comment on Response Bias

According to Oppenheim,16 "response bias" occurs when those who

answer a questionnaire differ from those who do not and consequently "the returns are not representative of the original sample drawn." One method of determining whether response bias has been introduced into a study is to compare the respondents with the nonrespondents on some known attribute.

Reaching a conclusion regarding the presence or absence of response bias in this particular investigation is somewhat difficult. From the total population of firms issuing a prospectus during the period December, 1972 through December, 1973, a sample of 70 firms was selected; these firms had provided useable earnings forecasts. Of this subpopulation of firms, published data was obtained on 57. Questionnaire data was obtained on 31 of these 57 firms. Therefore, any statement concerning response bias is limited to the final 1973 sample of 57 firms and says nothing about the initial subpopulation of 70 firms.

Recognizing this limitation, the respondents to the questionnaire may be compared to the nonrespondents on three attributes: (1) the average length of the forecast period, (2) the average relative forecast error, and (3) the incidence of overestimation and underestimation of forecasts. Other attributes could equally well have been utilized for this comparison; these three attributes appeared to be the most relevant in respect to the purposes of this study.

The average length of the forecast period for the total 1973 sample was 91.0 days. For the questionnaire respondents, the average length was 90.1 days; and, for the remaining 26 nonrespondents, the average length was 92.1 days. The 31 respondents were subject to a slightly shorter forecast period than the nonrespondents; however, the difference between
the two periods is insufficient to suggest that a response bias was present.

The average relative forecast error for the 1973 sample was 0.1361. For the questionnaire respondents the average error was 0.1561, and for the nonrespondents the average error was 0.1124. The difference (0.0437) between the average errors is unexpectedly large. A slight variation would naturally be expected, particularly since the average length of the forecast period varied; however, this finding suggests that the respondents tended to underestimate their forecasts by a greater percentage than did the nonrespondents. To a degree, a response bias by a more conservative element is suggested. Intuitively, a response bias from a conservative element would not be anticipated because it would appear logical that a conservative element would be less likely to divulge "sensitive" information about their company.

For the entire 1973 sample, the incidence of overestimated forecasts was three and of underestimated forecasts 54. For the questionnaire respondents, one overestimated and 30 underestimated forecasts were observed. For the nonrespondents, the incidence was two overestimated and 24 underestimated forecasts. These results also suggest a slight bias toward conservatism by the respondents. Since the average forecast error was largest for the respondent group, it would be anticipated that this group would have the largest percentage incidence of underestimated forecasts.

It is apparent that the two samples differ, but are the observed differences sufficient to conclude that a response bias was present. On two attributes the samples appear to differ slightly and on the third
attribute they are very similar. At worst, it can be concluded that the questionnaire respondents tended to be more conservative in their forecasting behavior than the nonrespondents, and therefore response bias is present to a slight degree. Additional evidence on this question appeared desirable, and subsequently another approach to measure response bias was undertaken.

Oppenheim states that "it has been found that respondents who send in their questionnaires very late are roughly similar to nonrespondents." The 31 questionnaires utilized in this study were received over a four month period. It is possible to determine whether or not bias has been introduced by comparing the results of the early respondents with the results of the late respondents. If the results are found to be significantly different, then it can be concluded that a response bias is present. The scores reported on the forecast-induced pressure questionnaire were believed to be the best available basis of comparison. Consequently, the pressure index scores were correlated with the order in which they were received; for example, the index score for the first questionnaire returned was paired with the number one and the index score for the last questionnaire returned was paired with the number thirty-one. The Kendall Rank Correlation method was utilized to correlate the variables.

A finding of a significant correlation coefficient would indicate the presence of response bias. The significance of the coefficient would indicate that a difference existed between the pressure index scores depending upon the order in which the questionnaires were returned. A

17 Oppenheim, loc. cit.
significant, positive coefficient could be hypothesized, implying that the later the questionnaire was returned, the higher the pressure index score, because the nonrespondents tended to be less conservative in their forecasting; and, since they were less conservative, they might be less certain of successfully attaining the forecast, implying higher felt pressure.

This approach resulted in an estimate of the Kendall tau of 0.0344, which was not significant even at a level of probability of 0.40. This result implies that there is no correlation between the pressure index scores and the order in which the questionnaires were returned. Consequently, it is concluded that on the basis of this test, the late respondents were no different from the earlier respondents, and therefore the early respondents were no different from the non-respondents, implying the absence of response bias.

The findings of this approach tend to contradict the findings of the first approach; however, since the findings of the first approach indicated only slight bias, the appropriate conclusion is that response bias is probably not present.

Reliability of the Questionnaire Results

The reliability of a test is the degree of consistency in repeated measurements. A test result is said to be "reliable" if the result is stable, i.e. free of chance error. 18

The most common approach to estimating the reliability of a

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18 Garrett, p. 337.
measurement instrument is the "split-half" method.\textsuperscript{19} Under this method, an instrument is arbitrarily divided into two parts, and the scores from each part are correlated to arrive at a measure of reliability. The correlation coefficient arrived at by this method, however, is not a unique value.

there are \[ \frac{n!}{2 \left( \frac{n}{2} \right)!^2} \] different ways of dividing a test of \( n \) items into two halves. Each one of these ways of splitting the test gives its own estimate of the reliability coefficient.\textsuperscript{20}

Given this limitation, the reliability of the forecast-induced pressure questionnaire was measured by means of Kuder and Richardson's equation \textsuperscript{20} for scale reliability, which provides a unique measure of reliability. The reliability coefficient obtained from equation \textsuperscript{20} is defined as:\textsuperscript{21}

\[ r_{tt} = \frac{n}{n-1} \cdot \frac{\sigma_t^2 - n \overline{pg}}{\sigma_t^2} \]

where \( n = \text{number of questionnaire items} \)
\( \sigma_t^2 = \text{variance of the questionnaire scores} \)
\( \overline{pg} = \text{average variance of the questionnaire items} \)

Unlike the split-half Spearman-Brown Coefficient, which may produce reliability estimates that are either too high or too low, the reliability estimate obtained from equation \textsuperscript{20} is never overestimated. Therefore, the questionnaire is at least as reliable as the coefficient indicates, and perhaps even more reliable.

\textsuperscript{19}Kuder and Richardson, loc. cit.
\textsuperscript{20}ibid.
\textsuperscript{21}ibid.
The reliability estimate computed from equation 20 was 0.849. With respect to the question of how high must the reliability estimate be, there is no answer; however, a reliability measure of 0.849 is generally taken to indicate a relatively high degree of reliability.

This high estimate of reliability has additional significance in that the measure of test reliability often serves as an indication of the validity of the test instrument. Therefore, on the basis of the obtained measure of reliability, a high level of validity may be presumed for the forecast-induced pressure questionnaire. This finding confirms the conclusion reached in Chapter Two that on the basis of face validity, the questionnaire was a valid instrument.

The reliability of part one of the questionnaire cannot be measured so readily; the results of part one cannot be quantified in the manner that the results of the pressure questionnaire were quantified. Another approach to reliability that can be applied to part one is an examination of the consistency of responses. If the responses to a particular set of questions are found to be consistent with the responses to a similar set of questions, or with known fact, the questionnaire results are said to be reliable.

Question eleven, section B, of the questionnaire requested that the respondent indicate how the forecast compared with actual results, or where the forecast period had not yet ended, how he perceived the forecast would compare with actual results. The responses to this question could then be compared with known fact: the actual results as published

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22 The Spearman-Brown reliability estimate was 0.886.
23 Oppenheim, p. 71.
in the annual statement of accounts. Twenty-five of the 31 respondents were able to factually state how the forecast compared with actual results because the period covered by their forecast had been completed; the remaining six respondents stated how they perceived actual results would compare with the forecast. In twenty-nine instances, the response provided by the respondent exactly equaled or closely approximated the results reported in the annual statement of accounts. This finding is interpreted as indicating reliability of the questionnaire responses.

Question eight, section A, requested that the respondent indicate the extent to which he agreed that "there are significant pressures existing upon [his] company to insure that the forecasted level of results is achieved." The distribution of responses to question eight was:

<table>
<thead>
<tr>
<th>Descriptive Statement</th>
<th>Number of Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly agree</td>
<td>23</td>
</tr>
<tr>
<td>Agree</td>
<td>7</td>
</tr>
<tr>
<td>Undecided</td>
<td>1</td>
</tr>
<tr>
<td>Disagree</td>
<td>0</td>
</tr>
<tr>
<td>Strongly disagree</td>
<td>31</td>
</tr>
</tbody>
</table>

If a weighting scheme of 5, 4, 3, 2, 1 is assigned to the responses "strongly agree," "agree," "undecided," "disagree," "strongly disagree," respectively, a quantitative measure of the responses to question eight can be obtained. This measure, 146, can then be compared to the mean of the forecast-induced pressure index, 156.71. Such a comparison provides yet another basis for evaluating the reliability of the questionnaire results by means of consistency in responses. Since the pressure questionnaire has previously been shown to be reliable, and the quantitative measure of question eight is relatively close to the mean value of the pressure index scores, the appropriate conclusion is that the results of
part one of the questionnaire are substantially reliable.

Analysis of Some Consequences of Forecast Disclosure

The public disclosure of corporate financial forecasts is often challenged on the grounds that there are certain undesirable consequences associated with it. Most notably, public disclosure of forecasts is said to be detrimental because it allows competitors to discover the operating plans of the forecasting firm. The questionnaire respondents were requested to indicate the extent to which their company utilized the profit forecasts of other companies in an effort to uncover their future operating plans (question five, section A). The distribution of their responses was:

<table>
<thead>
<tr>
<th>Descriptive Statement</th>
<th>Number of Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequently</td>
<td>1</td>
</tr>
<tr>
<td>Fairly often</td>
<td>0</td>
</tr>
<tr>
<td>Occasionally</td>
<td>9</td>
</tr>
<tr>
<td>Rarely</td>
<td>5</td>
</tr>
<tr>
<td>Never</td>
<td>16</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>31</td>
</tr>
</tbody>
</table>

These results indicate that approximately 50% of the responding firms do actually attempt to discover what their competitors are planning to do by utilizing forecasted information.

A related issue is whether or not such disclosures are actually detrimental to the firm. The respondents were requested to indicate their agreement with the statement that the publication of profit forecasts in the news media damages a company's competitive position (question six, section A). The distribution of responses to this question was:
<table>
<thead>
<tr>
<th>Descriptive Statement</th>
<th>Number of Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly agree</td>
<td>0</td>
</tr>
<tr>
<td>Agree</td>
<td>3</td>
</tr>
<tr>
<td>Undecided</td>
<td>6</td>
</tr>
<tr>
<td>Disagree</td>
<td>21</td>
</tr>
<tr>
<td>Strongly disagree</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>31</strong></td>
</tr>
</tbody>
</table>

Twenty-two of the thirty-one respondents indicated that the publication of forecasts is not detrimental to a company's market position. This result is somewhat unexpected when considered in conjunction with the responses to the previous question concerning the use of forecasted information to uncover the competition's future operations. If the disclosure of earnings forecasts does not damage a firm's competitive position, as the responses suggest, and yet 50% of the responding firms indicated that they had used forecasts to determine their competitors' plans, then the obvious conclusion is that the use of forecasts to determine a competitor's future operating plans is not very successful.

Another frequently mentioned consequence of forecast disclosure is that the publication of a forecast tends to reduce the motivational effectiveness of internal budgets (question seven, section A). If the published forecast is set below the internal forecast, as occurred in thirteen of the thirty-one firms, then management may not be motivated to achieve the internal levels, excluding considerations where achieving the internal budget is tied to compensation. If the published forecast is set above the internal forecast, as occurred in four firms, some question among management may arise as to exactly which figure is the real company objective. To examine this potential consequence, the respondents were requested to indicate their agreement with the statement that publishing profit forecasts undermines the motivational effectiveness of
internal budgets. The responses were quite consistent as the distribution indicates:

<table>
<thead>
<tr>
<th>Descriptive Statement</th>
<th>Number of Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly agree</td>
<td>0</td>
</tr>
<tr>
<td>Agree</td>
<td>1</td>
</tr>
<tr>
<td>Undecided</td>
<td>4</td>
</tr>
<tr>
<td>Disagree</td>
<td>22</td>
</tr>
<tr>
<td>Strongly disagree</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>31</td>
</tr>
</tbody>
</table>

Twenty-six respondents believed that the publication of forecasts did not affect the motivational aspects of internal budgets.

The results of these three questions imply that the publication of forecasts does not undermine the motivational effects of internal budgets, nor does it damage a firm's competitive position. Therefore, two commonly cited reasons for opposing the publication of forecasts were discounted by the majority in the sample studied.

Analysis of the Overestimation and Underestimation of Forecasts

In a previous section the results of the analysis of overestimation and underestimation of forecasts in the annual statement of accounts was presented. The finding of this analysis was an extremely high incidence of underestimated forecasts, approximately 92% of all forecasts examined. On the basis of this finding it was inferred that managerial forecast behavior in the prospectus situation tended to be conservative and was manifested in the underestimation of forecasted results. The data underlying this inference was considered insufficient, however, to conclude that management intentionally underestimated the forecasts. A series of questions in section B of the questionnaire examined the behavioral intentions of management.
Question five requested that the respondents comment upon the degree of optimism or pessimism of the forecast at the time that it was published. The distribution of responses to this question was:

<table>
<thead>
<tr>
<th>Descriptive Statement</th>
<th>Number of Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very optimistic</td>
<td>0</td>
</tr>
<tr>
<td>Optimistic</td>
<td>1</td>
</tr>
<tr>
<td>Realistic</td>
<td>16</td>
</tr>
<tr>
<td>Pessimistic</td>
<td>14</td>
</tr>
<tr>
<td>Very pessimistic</td>
<td>0</td>
</tr>
</tbody>
</table>

The majority (16) of the respondents considered their firm's forecast to be realistic; however, one respondent indicated that his firm's forecast had been optimistic and fourteen respondents indicated that theirs had been pessimistic. Thirteen of the fourteen "pessimistic" respondents and the sole "optimistic" respondent, indicated in question six that their firms had intentionally overestimated or underestimated the forecast. Therefore, only fourteen firms responded that their forecasts had been intentionally manipulated. With respect to this result, while only thirteen firms indicated that they had intentionally underestimated the forecast, all but one of the thirty-one firms was found to have an underestimated forecast. The degree of

---

24One possible explanation for the overestimation or underestimation of a forecast is that the assumptions underlying the forecast are unrealistic. The distribution of responses to question ten tends to discount this possibility:

<table>
<thead>
<tr>
<th>Descriptive Statement</th>
<th>Number of Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very optimistic</td>
<td>0</td>
</tr>
<tr>
<td>Optimistic</td>
<td>1</td>
</tr>
<tr>
<td>Realistic</td>
<td>24</td>
</tr>
<tr>
<td>Pessimistic</td>
<td>6</td>
</tr>
<tr>
<td>Very Pessimistic</td>
<td>0</td>
</tr>
</tbody>
</table>

31
underestimation for the thirteen "pessimistic" respondents ranged from 4 to 20%, with an average underestimation of the forecast of 9.7%.

Some of the divergence between the reported and observed results can perhaps be explained by the fact that question six was misinterpreted or misunderstood by at least seven of the respondents. Question fifteen asked the respondent whether or not his company had utilized a "contingency discount" in the determination of the prospectus forecast. Seventeen respondents indicated that their firm had used such a discount. The range of the reported discount was 2.5 to 20% of the initial forecast, with a mean discount of 8.2%. Presumably, seven of the seventeen responding firms did not view the use of a contingency discount as equivalent to intentionally underestimating the forecast; a comparison of the respondents on questions six and fifteen indicated that seven of the respondents to question fifteen did not indicate "intentional" manipulation of the forecast in question six. Nevertheless, the conclusion that must be deduced is that twenty-one of the thirty-one firms did in fact manipulate the forecast that was ultimately published in the prospectus.

Question eight of section B examined one of the most interesting facets of the entire study: the reasons why management had intentionally overestimated or underestimated the forecast. The majority of these

25A "contingency discount" is a discount that is applied to the initial, and presumably the realistic forecast to produce the figure that is ultimately published in the prospectus.

26Another approach that can be utilized to compromise a forecast is to include "correction factors" in the forecast, i.e. factors intended to prevent any deviation of the actual results from the forecasted results. The majority (24) of the firms indicated that they had not utilized this technique. One respondent who did acknowledge the use of correction factors illustrated his firm's method: the sale of a piece of property with the correct profit margin.
responses are presented in their quoted form; the main reasons for intentionally underestimating the forecast included:

(1) ... to insure that the forecast would be bettered, because British investors traditionally expect results slightly in excess of [the] forecast.

(2) ... loss of investment status if [the forecast is] not achieved.

(3) ... to provide for hyperinflation which is causing unforeseen escalation of costs.

(4) ... to cover any unforeseen contingencies, and to satisfy the reporting accountants, stockbrokers, etc.

(5) ... prudence

(6) ... conservative professional advisors [to the firm].

(7) We considered that investors would expect us to exceed our forecast and if we failed to do so our share price would be adversely affected.

(8) The ensuing year was likely to produce difficult trading conditions due to raw material shortages and fluctuating raw material prices, therefore it was prudent to underestimate.

(9) Failure to achieve comfortably the prospectus forecast is considered to reflect badly upon the company and its management by the investor and the financial world generally.

In the single case where the respondent indicated that his firm had intentionally overestimated the forecast, the explanation given was that "it was anticipated that a number of further [planned] acquisitions would make the original forecast a low one."

The above responses suggest that, without exception, underestimation of prospectus forecasts is a function of two factors: (1) a learned attitude of conservatism, and (2) a concern for the reaction of the business community to forecast failures, typically conveyed as a "loss of investment status," the "share price...adversely affected," and a general
reduction in confidence and credibility in the firm. If management was not concerned over the market's reaction to forecast failure, it is highly unlikely that statements similar to the above would be made.

It should also be observed that the reasons offered by management to explain their forecast behavior are consistent with the environmental considerations hypothesized in the model of chapter one (Figure 1). Therefore, this finding suggests that the part of the model relevant to this investigation is consistent with the real world.

The results obtained from the previously discussed three questions all tend to support the findings of the analysis of the annual statement of accounts, although they are not as significant. The analysis of annual reports found 91.8% of all forecasts examined to be underestimated. Of the 31 questionnaire respondents, only 68% admitted to some form of forecast manipulation. The average relative forecast error for the entire study sample was 0.1607; yet the questionnaire respondents admitted to underestimating forecasts by only an average of 0.0970. One explanation for this divergence between observed and reported results is the presence of unexpected events, i.e. of the failure of the assumptions underlying the forecast to hold.

In question eleven, section A, nineteen of the thirty-one respondents indicated that "significant" events, which affected profits and were not accounted for in the forecast, had occurred during the forecast period. This same group of respondents indicated that, on the average, 22% of the total deviation between forecasted and actual results could be attributed
to these significant, unanticipated events. Consequently, the presence of these unexpected events can explain the majority of the difference (0.0637) between the observed mean error of underestimation (0.1607) and the reported mean error of underestimation (0.0970).

The presence of these events, however, does not appear to be sufficient to explain the total deviation between the observed percentage of underestimated forecasts (91.8%) and the reported percentage of intentionally underestimated forecasts (65%). Two possible alternative explanations exist. Either the respondents were not willing to admit to the intentional manipulation of the forecasts, or the forecasting skills and techniques of management were not adequate; either one of these explanations appears equally possible.

Notwithstanding the unexplained differences between the observed and reported results, the appropriate conclusion to be drawn from the analysis of this section is that management does, in some cases, intentionally underestimate and overestimate the forecast in the prospectus situation.

A final consideration in this section is whether or not the intentional manipulation of a published forecast constitutes ethical behavior on the part of management. The questionnaire respondents were requested to indicate whether or not they viewed such behavior as conflicting with

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27 The range of the total deviation between forecasted and actual results that could be explained by the failure of the assumptions underlying the forecast was indicated to be from zero to 100%.

28 The observed mean deviation between forecasted and actual results is 0.1607; twenty-two percent of this deviation, or 0.0354, can be attributed to the unanticipated events. The reported mean forecast error was 0.0970, hence the total mean explained error is 0.1324.
their own managerial code of ethics. A conclusion cannot be reached, however, because the results are inconclusive. The distribution of responses to the question was:

<table>
<thead>
<tr>
<th>Descriptive Statement</th>
<th>Number of Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly agree</td>
<td>3</td>
</tr>
<tr>
<td>Agree</td>
<td>3</td>
</tr>
<tr>
<td>Undecided</td>
<td>3</td>
</tr>
<tr>
<td>Disagree</td>
<td>6</td>
</tr>
<tr>
<td>Strongly disagree</td>
<td>3</td>
</tr>
<tr>
<td>(No response: 13)</td>
<td>18</td>
</tr>
</tbody>
</table>

Analysis of The Use of Accounting Adjustments to Minimize Forecast Deviations

Proposition one of the theory of forecast-deviation minimization states that the management of forecasting firms will be motivated to report results falling within an acceptable zone of values around the forecast. One approach to this problem is to utilize accounting adjustments when actual results deviate from the zone of acceptable values. The analysis of annual reports found that only 55 firms in the total sample of 283 had experienced accounting adjustments during the forecast period. Of these 55 observations, accounting adjustments resulted in an increase to reported earnings in 46 cases and a decrease to reported earnings in nine cases. Only seven cases were found to confirm proposition one. Two primary observations were made in that section: (1) there was an unexpected, low incidence of accounting adjustments, and (2) the observed accounting adjustments did not appear to be utilized for the purpose of minimizing forecast deviations.

Two possible explanations for these observations may be offered: (1) the management of forecasting firms do not utilize accounting
adjustments to reduce forecast deviations, but rather they use discretionary actions; and (2) the management of forecasting firms are not motivated to reduce forecast deviations. The first explanation will be considered in the following section.

Proposition one is premised in the idea that management will in fact be motivated to (1) achieve the forecast and (2) report results within a zone of acceptance. It has been previously reported (see "Reliability of the Questionnaire Results") that 30 of the 31 questionnaire respondents felt that there were significant pressures existing upon their firms to insure that the forecasted level of results was achieved. To the extent that these pressures are viewed as motivating, then the premise of proposition one would appear in part verified, at least for the sample studied. The question was more directly approached in question one, section C, in which the respondents were requested to indicate how important they felt that it was to achieve the forecast. The distribution of responses to this question was:

<table>
<thead>
<tr>
<th>Descriptive Statement</th>
<th>Number of Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extremely important</td>
<td>26</td>
</tr>
<tr>
<td>Somewhat important</td>
<td>2</td>
</tr>
<tr>
<td>Important</td>
<td>3</td>
</tr>
<tr>
<td>Not very important</td>
<td>0</td>
</tr>
<tr>
<td>Extremely unimportant</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>31</td>
</tr>
</tbody>
</table>

The consensus is clear: management believes that achieving the forecast is relatively important. This finding appears representative of a comment made by one of the respondents: "Public Forecasts must be achieved." The results of questions one and eight provide sufficient evidence to infer that management is motivated to achieve the forecast. But is management motivated to report results within a zone of acceptable values? The ex
post results of the analysis of annual reports suggest a negative response, i.e. that managers are not motivated to report results within a zone of acceptance. This question was not explicitly considered in the questionnaire, and therefore a conclusion will be inferred from the analysis of this and the following sections.

Question four posed the question: Has your company ever utilized alternative accounting methods for the express purpose of reducing the expected deviation between actual and forecasted results? The distribution of responses to this question was:

<table>
<thead>
<tr>
<th>Descriptive Statement</th>
<th>Number of Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequently</td>
<td>0</td>
</tr>
<tr>
<td>Fairly often</td>
<td>0</td>
</tr>
<tr>
<td>Occasionally</td>
<td>1</td>
</tr>
<tr>
<td>Rarely</td>
<td>6</td>
</tr>
<tr>
<td>Never</td>
<td>24</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>31</strong></td>
</tr>
</tbody>
</table>

Seven of the responding firms, or 22.6%, indicated that they had utilized accounting methods for the express purpose of reducing forecast deviations. Several of these firms indicated the accounting methods that were utilized: (1) a change in the basis of depreciation, (2) a stock write-off of materials which would be used at a later date, and (3) capitalizing certain reorganization expenses that would normally have been immediately written-off. One of the respondents commented that his firm would never utilize accounting adjustments to reduce forecast deviations because the adjustments would have to be detailed in the annual statement of accounts, in accordance with the Companies Act of 1973. One implication of this comment is that accounting adjustments are viewed by some managers as being "too obvious" an approach to forecast deviation reduction; this view would readily explain the low incidence of observed and reported accounting
adjustments.

The results of question four suggest that seven firms operated in a manner basically consistent with proposition one. It cannot be inferred that the firms performed exactly in the manner hypothesized by proposition one because question four did not explicitly inquire whether the firms had utilized accounting adjustments to report results within a zone of acceptable values, but only whether they had utilized accounting adjustments to reduce forecast deviations.

Nevertheless, seven of the 31 firms did utilize accounting adjustments for the purpose of reducing forecast deviations. These results are insufficient to infer the generalization that forecasting firms tend to utilize accounting adjustments to reduce forecast deviations. The low incidence of reported usage of accounting adjustments tends to confirm the finding of the analysis of annual reports that, ex post, very few accounting adjustments were utilized to reduce forecast deviations.

Another type of potential "artificial response" is the failure to undertake planned or desirable accounting changes because of their effect upon forecast deviations. Question five stated: Has your company ever failed to undertake a change in accounting method because of the adverse effect of such a change on the expected deviation between actual and forecasted results? The distribution of the responses to this question was:
<table>
<thead>
<tr>
<th>Descriptive Statement</th>
<th>Number of Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequently</td>
<td>0</td>
</tr>
<tr>
<td>Fairly often</td>
<td>0</td>
</tr>
<tr>
<td>Occasionally</td>
<td>2</td>
</tr>
<tr>
<td>Rarely</td>
<td>3</td>
</tr>
<tr>
<td>Never</td>
<td>26</td>
</tr>
<tr>
<td></td>
<td><strong>31</strong></td>
</tr>
</tbody>
</table>

The results indicate that in only five firms were accounting changes ever avoided because of their effect upon forecast deviations. Combining the results of questions four and five yields twelve instances of artificial responses; however, only ten different firms are represented because two firms indicated that they had both undertaken and avoided accounting changes on the basis of their effect upon forecast deviations. Therefore, the cumulative results suggest that approximately 32.2% of the sample studied utilized artificial responses in the forecast disclosure situation.

The results of question five also suggest another potential explanation for the low incidence of accounting adjustments: accounting adjustments are avoided because they can adversely affect forecast deviations.

The use of artificial responses to influence forecast deviations was considered from yet another perspective in question six: Has your company ever attempted to adjust any accounting records for the express purpose of reducing the expected deviation between actual and forecasted results? The distribution of responses was:

<table>
<thead>
<tr>
<th>Descriptive Statement</th>
<th>Number of Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequently</td>
<td>0</td>
</tr>
<tr>
<td>Fairly often</td>
<td>0</td>
</tr>
<tr>
<td>Occasionally</td>
<td>3</td>
</tr>
<tr>
<td>Rarely</td>
<td>2</td>
</tr>
<tr>
<td>Never</td>
<td>26</td>
</tr>
<tr>
<td></td>
<td><strong>31</strong></td>
</tr>
</tbody>
</table>
The results again indicate that a small percentage of firms resorted to the use of artificial responses for the purpose of reducing forecast deviations. Of the five firms which indicated that they had resorted to the adjustment of accounting records, two had previously indicated utilization or avoidance of accounting changes because of their effect on forecast deviations. Consequently, the total incidence of firms utilizing artificial responses (defined as the use of alternative accounting methods, the avoidance of the use of alternative accounting methods, and the adjustment of accounting records) was 13 firms, or 41.7% of the total sample studied.

The results of the questionnaire analysis of the use of artificial responses tends to confirm the results of the ex-post analysis. In both analyses, the use of artificial responses is observable but not overwhelming. In the questionnaire analysis, 41.7% of the firms studied reported that they had utilized artificial responses. In the ex-post analysis, only artificial responses defined as changes in accounting methods were considered, and consequently only 6.4% of the total sample was found to utilize accounting adjustments to reduce forecast deviations.29 The combined results of the analyses do not support the generality that management utilizes artificial responses for the purpose of reducing forecast deviations. Consequently, it cannot be concluded that the managers of forecasting firms behave in a manner consistent with proposition one, viewed only from the standpoint of artificial responses.

A final consideration was the effect of the reported artificial

29 Of the 55 firms experiencing accounting adjustments, 18 or 32.7% were found to have adjustments which reduced the forecast deviation; therefore, in 67.3% of the cases, the use of accounting adjustments actually increased the forecast deviation.
responses on actual results. Two questions were directed at this issue. Question seven inquired: Has your company ever adjusted profit upward in an effort to achieve a forecast? The distribution of responses was:

<table>
<thead>
<tr>
<th>Descriptive Statement</th>
<th>Number of Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequently</td>
<td>0</td>
</tr>
<tr>
<td>Fairly often</td>
<td>0</td>
</tr>
<tr>
<td>Occasionally</td>
<td>0</td>
</tr>
<tr>
<td>Rarely</td>
<td>3</td>
</tr>
<tr>
<td>Never</td>
<td>28</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>31</td>
</tr>
</tbody>
</table>

Question eight inquired: Has your company ever adjusted profit downward in an effort to achieve a forecast? The distribution of responses was:

<table>
<thead>
<tr>
<th>Descriptive Statement</th>
<th>Number of Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequently</td>
<td>1</td>
</tr>
<tr>
<td>Fairly often</td>
<td>0</td>
</tr>
<tr>
<td>Occasionally</td>
<td>8</td>
</tr>
<tr>
<td>Rarely</td>
<td>2</td>
</tr>
<tr>
<td>Never</td>
<td>20</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>31</td>
</tr>
</tbody>
</table>

The results indicate that in three firms profits had been adjusted upward while in eleven firms profits had been adjusted downward. This finding suggests several inferences: (1) firms tend to over-achieve their forecast and consequently find it necessary to adjust profits downward to a realistic level; (2) an upper limit on the zone of acceptance is suggested for at least those eleven firms which adjusted profit downward; and (3) a nearly symmetric loss function is suggested for the managers of the eleven firms.

Analysis of The Use of Discretionary Actions To Minimize Forecast Deviations

While management may utilize accounting procedures as a means to
insure that forecasts are achieved, a less obvious and perhaps more efficient approach is the use of discretionary actions. Discretionary actions refer to internal operating decisions, policies, and strategies that may be planned or altered to reduce forecast deviations. The use of discretionary actions in this manner was previously labelled "real responses."

The respondents were asked (question two, section C): Did your concern for achieving the forecast ever consciously influence the operating decisions that you made during the period covered by the forecast? The distribution of responses to this question was:

<table>
<thead>
<tr>
<th>Descriptive Statement</th>
<th>Number of Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequently</td>
<td>5</td>
</tr>
<tr>
<td>Fairly often</td>
<td>6</td>
</tr>
<tr>
<td>Occasionally</td>
<td>9</td>
</tr>
<tr>
<td>Rarely</td>
<td>6</td>
</tr>
<tr>
<td>Never</td>
<td>5</td>
</tr>
</tbody>
</table>

The results indicate that in the sample studied, 26 of 31 firms did in fact consciously allow their operating decisions to be influenced by the forecast disclosure situation. It will be recalled from the previous section that (1) all 31 firms indicated that achieving the forecast was relatively important, and (2) only 13 firms indicated that they had utilized artificial responses. The conclusion suggested by these results is that for the sample studied, managers preferred to utilize discretionary actions rather than accounting adjustments for the purpose of forecast achievement.

To gain a better perspective of the extent to which forecast achievement influenced operating decisions, the respondents were requested to provide one or more examples of the type of operating decision that was
influenced by the disclosure situation. Some of the examples cited included:

(1) During the last month of the fiscal period, when deciding which piece of property to sell, the decision was made solely on the basis of profit margins, i.e. which property would give the correct profit margin [to insure the forecast was achieved].

(2) The decision was made not to sell a building that we had planned to sell.

(3) Large repairs to a factory roof were deferred.

(4) Revenue was recognized in one accounting period rather than another.

(5) We declined to take on risky business which we would have normally accepted.

(6) A decision on the possible acquisition of loss making companies which would have been included in consolidated results was deferred.

(7) Normally inventory is taken during the first two working days of the new year; this year, stock was taken prior to the end of year holiday, thereby cutting production and sales by two days.

(8) The hiring of additional selling staff was delayed eight weeks.

(9) Every decision during the forecast period was considered in relation to its effect on the forecast.

(10) Quite frankly, virtually all decisions are based on achieving or exceeding the forecasts.

The results of question two indicate that the internal operating decisions of over 83.8% of the firms studied were influenced by the forecast disclosure situation; however, to what extent were these decisions influenced in a manner consistent with the behavior hypothesized by proposition one.

Question three inquired: Has your company ever consciously attempted to alter any decision or activity for the purpose of reducing the expected
deviation of actual results from the forecasted results? The distribution of responses was:

<table>
<thead>
<tr>
<th>Descriptive Statement</th>
<th>Number of Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequently</td>
<td>1</td>
</tr>
<tr>
<td>Fairly often</td>
<td>3</td>
</tr>
<tr>
<td>Occasionally</td>
<td>10</td>
</tr>
<tr>
<td>Rarely</td>
<td>8</td>
</tr>
<tr>
<td>Never</td>
<td>5</td>
</tr>
</tbody>
</table>

\[31\]

Of the 26 firms that responded that their operating decisions had been influenced by their concern for achieving the forecast, only 22 firms consciously allowed their decisions or actions to be altered for the purpose of reducing forecast deviations. Presumably, the remaining four firms allowed their decisions and actions to be altered only for the purpose of exceeding the forecast.

This result cannot be interpreted as explicitly confirming proposition one; question three inquired only whether decisions and actions were altered to reduce forecast deviations, not whether they were altered to reduce forecast deviations to within some zone of acceptable values. Nevertheless, the result can be interpreted as indicating that the managements of the firms studied do tend to behave in a manner implicitly consistent with proposition one.

The respondents were also requested to cite examples of the type of decision or activity that was altered in their firm. Some of the examples given were:

1. Delaying the agreement of a claim against a client and thereby moving profit into a later accounting period.

2. Billing customers for services rendered in the next fiscal year, rather than at the end of the current year.

3. Accepting some work at lower than normal profit margins to hold down the reported results.
(4) Delaying the installation of computers until the following financial period.

(5) Instituting an extra sales effort.

(6) Increasing prices one month before the local management team deemed it sensible.

(7) Making a larger than planned investment in a new business gaining activity.

Question three was revised slightly to consider real responses from the standpoint of operating policies or strategies. The question stated: Has the management ever pursued any operating policies expressly directed at minimizing the expected deviation between actual and forecasted results? The distribution of responses to the question was:

<table>
<thead>
<tr>
<th>Descriptive Statement</th>
<th>Number of Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequently</td>
<td>1</td>
</tr>
<tr>
<td>Fairly often</td>
<td>3</td>
</tr>
<tr>
<td>Occasionally</td>
<td>6</td>
</tr>
<tr>
<td>Rarely</td>
<td>6</td>
</tr>
<tr>
<td>Never</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>31</td>
</tr>
</tbody>
</table>

On the question of policies, 16 firms responded that they had pursued operating policies expressly directed at forecast-deviation minimization. Consequently, approximately 51.6% of the firms studied actively planned and pursued operating strategies designed to manipulate the reported results.

A final refinement of the issue concerning the use of real responses was expressed in question ten: Has there ever been any attempt to suppress profits or avoid expenditures in an effort to reduce expected deviations between actual and forecasted results? The distribution of responses was:
Sixteen of the 31 respondents indicated that at some time during the forecast period, profits had been suppressed or expenditures avoided for the purpose of reducing forecast deviations.

Aggregating the results of the previous four questions suggests several observations. Of the 31 firms in the questionnaire sample, 26 responded that their operating decisions had been consciously influenced by their concern for achieving the forecast. Of the 26 firms, 22 indicated that they had consciously engaged in some type of real response: (1) 22 firms manipulated their operating decisions and activities for the purpose of reducing forecast deviations; (2) 16 pursued operating policies expressly directed at minimizing expected forecast deviations; and (3) 16 attempted to suppress profits or avoid certain expenditures in order to reduce anticipated forecast deviations. Consequently, over 71% of the sample studied utilized some type of real behavioral response.

Further, on the basis of reasons mentioned to justify the overestimation or underestimation of forecasts (see "Analysis of the Overestimation and Underestimation of Forecasts"), it can be concluded that the real responses reported in the questionnaire survey were motivated by the environmental considerations hypothesized in Figure 1.

Further, considering the high percentage of real responses reported in the survey, and the low incidence of both observed and reported artificial responses, it can be concluded that managers utilize discretionary
actions rather than accounting adjustments to reduce anticipated forecast deviations.

And finally, while proposition one was not explicitly considered in the questionnaire survey, the results implicitly confirm the conclusion that managers utilize real responses in a manner consistent with the proposition; that is, managers are motivated to report results within some zone of acceptable values by employing real behavioral responses, and not artificial responses. Consequently, the results imply that, contrary to the inference made on the basis of the results of the *ex post* data analysis, the upper limit of the zone of acceptance is defined for at least a majority of the firms studied, although the zone does not appear to be constant across firms.

Analysis of The Forecast-Induced Pressure Questionnaire

The forecast-induced pressure questionnaire attempted to quantify the level of pressure to reduce forecast deviations that was felt or perceived by the management of forecasting firms. The pressure index was a necessary measure in order to directly test proposition two of the theory of forecast-deviation minimization. Proposition two states: the greater the actual or perceived deviation of operating results from the zone of acceptance, the greater the felt forecast-induced pressure to minimize those deviations.

The distribution statistics of the forecast-induced pressure index scores are presented in Table 25.
Table 25: Statistics of the Distribution of The Forecast-Induced Pressure Index

<table>
<thead>
<tr>
<th>Sample Size</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Observed Range</th>
<th>Observed Maximum Value</th>
<th>Observed Minimum Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>31</td>
<td>156.710</td>
<td>18.585</td>
<td>74.000</td>
<td>196.000</td>
<td>122.000</td>
</tr>
</tbody>
</table>

The theoretical range of the pressure index was 200, from a maximum value of 250 to a minimum value of 50. Although the observed mean of 156.710 appears very close to the theoretical mean of 150.000, the distribution of scores does not approximate a normal distribution. The absence of normality is observable in Figure 9, a histogram of the forecast-induced pressure questionnaire scores.

Proposition two was tested by correlating the pressure index scores with the actual or anticipated deviation of operating results from the zone of acceptance, using the Kendall Rank Correlation method. Question eleven, section B, asked the respondents to indicate the actual or anticipated deviation of results from the forecast. The test of proposition two was conducted twice; in the first test, the "actual or anticipated deviation" was defined as the numerical deviation of results from the zone of acceptance; in the second test, the "actual or anticipated deviation" was defined as the percentage deviation of results from the zone of acceptance. The second test was undertaken in an effort to avoid any biases caused by firm size.
Figure 9: Histogram of the Forecast-Induced Pressure Index Scores

The results of both tests were insignificant at a level of probability of 0.10. The results were also inconsistent with the hypothesized result. A positive correlation had been hypothesized on the belief that as the actual or perceived deviation increases, the level of felt forecast-induced pressure would also increase; however, a negative correlation was obtained in both tests, suggesting that as the deviation increased, the felt pressure decreased.

The results of the ex post data analysis inferred the possibility that an upper limit to the zone of acceptance might not exist; or if it did exist, it was not constant across firms. To consider this possibility, proposition two was retested assuming no upper limit on the zone of acceptance. Consequently, the pressure index scores were correlated with (1) the numerical deviation of actual or anticipated results from the forecast, and (2) the percentage deviation of actual or anticipated results from the forecast. Results significant at a level of probability of 0.10 were obtained; however, the correlation coefficient was again
negative. The results of the second test also failed to confirm proposition two.

The conclusion suggested by these results is that the level of forecast-induced pressure does not increase with either the numerical or the percentage deviation of results from either the zone of acceptance or the forecast. Consequently, proposition two cannot be held to be valid.

This conclusion must be qualified in three respects. First, the questionnaire attempted to measure felt pressure _ex post_; hence, for most respondents, the questionnaire requested them to indicate the degree of pressure that they perceived at some earlier date. Second, the test correlated an _ex post_ measure of pressure with operating results that may have been compromised by discretionary actions on the part of management; therefore, while the test was conducted with the best available data, the data itself may not have been very reliable. Finally, four of the firms indicated that they had revised their forecast during the forecast period; consequently, the forecast-induced pressure may very well have been reduced or even eliminated for these four firms.

The results of the forecast-induced pressure questionnaire were also used to test several secondary hypotheses. The first hypothesis concerned the potential relationship between forecast-induced pressure and firm size. On the one hand, since larger firms could presumably devote greater

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30 The presence of discretionary actions could reduce the forecast error and consequently produce misleading results; that is, if a high level of pressure is felt, management may undertake discretionary actions, thereby causing the forecast error to be reduced and consequently producing a negative correlation between felt pressure and forecast deviation. A more desirable approach, though generally not feasible, would involve measuring the felt forecast pressure and the anticipated forecast deviation prior to the utilization of discretionary actions by management.
resources to the forecasting process, less pressure would be expected because greater accuracy is more probable; on the other hand, for the very reason that greater resources were devoted to the forecasting process, the business community is likely to demand greater accuracy from larger firms, and consequently instill greater pressures. Utilizing the Kendall Rank Correlation method, the pressure index scores were correlated with firm size, defined in three ways: (1) average total assets, (2) current year revenues, and (3) current year profits.

Under each of the definitions a negative correlation coefficient was obtained, suggesting that as size increases, felt pressure decreases. The correlation coefficient was significant at a level of probability of 0.10 for size defined as average total assets and current year profits. The coefficient was significant at a level of probability of 0.05 for size defined as current year revenue.

The second hypothesis tested concerned the potential relationship between forecast-induced pressure and the length of the forecast period. Presumably, the correlation would be significantly positive. As the length of the forecast period increases, so increases forecast error; and hence, in the short run forecast accuracy should be greatest, with consequently less forecast-induced pressure. This hypothesis was tested by correlating the forecast-induced pressure index score with the length of the forecast period measured in days. The correlation coefficient was both negative and insignificant.
A final Comment on Questionnaire Result Validity

One of the greatest concerns in evaluating an investigation of this nature is the validity of the questionnaire responses. Some of the questionnaire items utilized in the study requested sensitive, and even damaging information from the respondents. Undoubtedly, public knowledge of some of the responses to the questionnaire items could have had serious repercussions for certain of the responding firms.

Perhaps the best indication of the validity of the questionnaire responses is the very nature of responses themselves. Consequently, the responses are, for the most part, believed to be true statements of reality.
CHAPTER IV

SUMMARY, CONCLUSIONS, AND RESEARCH RECOMMENDATIONS

The purpose of the descriptive survey is to count. When it cannot count everyone, it counts a representative sample and then, makes inferences about the population as a whole.¹

Summary of Results

During the period January, 1970 through December, 1973, well in excess of 600 prospectuses for the issue of capital were released by firms listed on the United Kingdom stock exchange system. The population of prospectuses containing a forecast of future earnings numbered only about 347. From this population, a subpopulation of 274 different firms was obtained. Consequently, approximately 79% of the total population of prospectuses containing earnings forecasts issued during this time period was examined in the study.

According to the model of anticipated behavioral responses to the forecast disclosure situation (Figure 1), managerial behavior during the forecast specification process may be described as pessimistic, realistic, or optimistic. Depending upon the nature of this behavior, the forecast issued in the prospectus may be underestimated, realistic, or overestimated. Based upon the previous research of Dev and Webb, a significant

¹Oppenheim, p. 8.

133.
trend of underestimation in the forecasted results was hypothesized. The underestimation or overestimation of results was measured by a relative forecast error, in which the actual forecast error, adjusted for accounting changes, was expressed as a percentage of forecasted earnings. Of the 283 forecasts examined, 260 were found to be underestimated. The percentage of forecasts underestimated in the years 1970 through 1973 was 92.2%, 87.1%, 93.3%, and 94.7% respectively. For the total sample, 91.8% of all forecasts examined were found to be underestimated. The forecast error was found to range from 182.5% underestimated to 70.6% overestimated, with a mean forecast error of 16% underestimated.

Since the relative forecast error was an ex post data item, and was subject to many influences in addition to the initial managerial behavioral intent, meaningful conclusions regarding managerial behavior in the forecast disclosure situation could not be reached on the basis of this data item alone. Therefore, a questionnaire survey of 31 firms from the 1973 sample was conducted. The questionnaire was examined for reliability and response bias. Using Kuder and Richardson's equation 20 for scale reliability, a reliability coefficient of 0.849 was obtained, indicating a high degree of reliability. Response bias was tested for by several approaches and in only one approach was even a slight indication of bias found.

Fourteen of the 31 respondents to the questionnaire indicated that their firm's forecast had been intentionally overestimated or underestimated; seventeen responded that their firm had utilized a contingency

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2The total of 283 forecasts is obtained by adding the 274 different firms plus the seven double-forecasts plus the two second-time forecasts.
discount in the determination of the forecast. A comparison of the respondents on the two questions indicated that 21 different firms, or 68% of the sample studied, published forecasts that had been manipulated. Part of the difference between the reported results and the observed results was found to be attributed to unanticipated events that had occurred during the forecast period and that had not been accounted for in the forecast; the unexplained portion of the difference might be attributed to two factors: (1) a reluctance on the part of some managers to admit to manipulating the forecast, and (2) inadequate forecasting skills and techniques.

The results of the ex post data analysis and of the questionnaire analysis both tended to confirm the hypothesized trend of underestimation. An examination of the distribution of relative forecast errors provided further confirmation. In every year and as a total sample, the distribution was observed to be non-normal with a fat, extended tail in the positive direction. The observed finding of underestimation was verified by computing the coefficient of skewness, which was found to be large and positive in every year.

A final statistical examination of the trend in forecasting was made by conducting a Binomial One-Sample Test to compare the probability of occurrence of an underestimated forecast with the probability of occurrence of an overestimated forecast. At a level of probability of 0.01, the probability of occurrence of an underestimated forecast was found to exceed the probability of occurrence of an overestimated forecast.

Several hypotheses were also tested to determine if the tendency to overestimate or underestimate the forecast was associated with any of
several quantifiable variables. A Kruskal-Wallis test was conducted to determine if a relationship existed between the relative forecast error and the industrial classification of the forecasting firm. A classification scheme consistent with the system utilized in The Financial Times was used. In every year, at a level of probability of 0.05, the result was found to be insignificant, suggesting that no relationship existed in the sample studied between the tendency to overestimate or underestimate the forecast and firm industry classification.

The Kendall Rank Correlation method was utilized to determine if a relationship existed between firm size and the relative forecast error. For size defined as average total assets and current year revenues, the correlation coefficient was found to be neither significant nor consistent in sign between the years; however, for size defined as current year earnings, a significantly positive coefficient at a level of probability of 0.10 was obtained for 1972, 1973, and all years taken together.

A final hypothesis tested concerned the relationship between the aggregate strength of the stock market and the size of the relative forecast error; that is, it was hypothesized that the magnitude of the relative forecast error would be correlated with the aggregate stock market performance. At a level of probability of 0.05, the Kendall Rank Correlation was found to be significant only for the 1970 results. The hypothesis was then segmented into two separate hypotheses and retested. The previous research results of Stewarts appeared to be confirmed; at a level of probability of 0.07, a significantly positive correlation coefficient was obtained between the size of the overestimated forecasts and the strength of the market, suggesting that overestimation in forecasting tends to be
correlated with the aggregate strength of the market.

The model of anticipated behavioral responses to the forecast disclosure situation indicated that managerial behavior subsequent to forecast disclosure may take one of two directions: (1) attempt to revise anticipated or reported results, or (2) do not attempt to revise the results. To explain managerial behavior under the first direction, where an attempt to revise the results is undertaken, a theory of forecast-deviation minimization was suggested. The theory, composed of two propositions, stated:

Proposition One: Management will be motivated to insure that actual reported results fall within some acceptable range of values around the forecast.

Proposition Two: The greater the actual or perceived deviation of actual results from the acceptable range of values, the greater the felt forecast-induced pressure to minimize those deviations.

Two types of managerial responses could be utilized to insure that the results fall within the zone of acceptance: (1) artificial behavioral responses, and (2) real behavioral responses. Artificial responses refer to the use of accounting adjustments, i.e. the use of alternative accounting methods, the avoidance of the use of alternative accounting methods, and the adjustment of accounting records. Real responses refer to the discretionary actions of management, such as operating decisions, policies and strategies.

Proposition one was examined from both the artificial and real response standpoints; that is, did management utilize artificial responses to report results within the zone of acceptance, and did management utilize real responses to report results within the zone of acceptance.
A numerical zone of acceptance was determined by requesting the 31 questionnaire respondents to indicate the acceptable range of values for their own firms. For the 31 respondents, the zone indicated in their questionnaire was utilized; for the remaining 252 observations, the median of the 31 questionnaire responses was used to define the zone. The median zone of acceptance was 5% above the forecast to 0% below.

An analysis of the annual statement of accounts for the entire sample indicated that only 70 firms (24.7%) reported results within the zone of acceptance, and therefore tended to confirm proposition one. Additionally, only 55 firms experienced accounting adjustments during the four year period. Of that number, only seven instances were found to support proposition one. Therefore, of the 70 firms which reported results within the zone of acceptance, only seven, or 10%, reported results within the zone because they had apparently utilized artificial responses. For the 70 firms confirming proposition one, a large incidence of small firms and industrial firms was observed; no relationship could obviously be found between the seven firms and industrial classification or size classification.

The results of the annual statement of accounts analysis of proposition one were basically confirmed by the questionnaire analysis of the use of artificial responses. Thirteen of the 31 respondents, or 41.7% of the sample studied, indicated that they had utilized some type of artificial response to reduce anticipated or actual forecast deviations. On the basis of the results of both analyses, it was inferred that proposition one could not be confirmed, at least from the standpoint of artificial responses. From the standpoint of real responses, however, the proposition did appear confirmed, at least for the majority of the questionnaire sample. Twenty-six of the 31 respondents indicated that their operating decisions had been consciously influenced by their concern for
achieving the forecast. Twenty-two of the respondents indicated that they had consciously utilized some type of real response to reduce forecast deviations: (a) 22 had altered their operating decisions or activities; (b) 16 had pursued operating policies directed at deviation minimization; and (c) 16 had suppressed profits or avoided expenditures. Therefore, 71% of the firms examined responded that they had utilized real responses in a manner implicitly consistent with proposition one.

Proposition two was tested by correlating a measure of felt pressure with the actual or perceived deviation of results from the zone of acceptance. Part two of the questionnaire was the forecast-induced pressure questionnaire, which attempted to quantify the level of pressure to reduce forecast deviations that was felt or perceived by the managers of the forecasting firms. The pressure questionnaire was quantified in such a manner as to yield a numerical forecast-induced pressure index. The pressure index was correlated with the actual or perceived deviation of results from the zone of acceptance utilizing the Kendall Rank Correlation method. The test of proposition two was conducted twice; in the first test, the pressure index was correlated with the numerical deviation of results from the zone of acceptance, and in the second test, the pressure index was correlated with the percentage deviation of results from the zone of acceptance. The correlation coefficient of both tests was found to be insignificant at a level of probability of 0.10, suggesting that proposition two could not be confirmed for the sample studied.

Conclusions

The purpose of this investigation was to describe managerial behavior
in the prospectus forecast disclosure situation. According to the model in Figure 1, managerial behavior can be analyzed and described at two separate instances: (1) during the forecast specification process, and (2) subsequent to forecast disclosure in the prospectus. Therefore, the purpose of this study was to present findings indicating the behavior of management at these two points in time.

During the data analysis phase of this investigation, annual reports from approximately 79% of the total population of firms issuing prospectuses with earnings forecasts in 1970 through 1973 were examined. Additionally, questionnaires from approximately 8.9% of the total population were received and analyzed. Considering the large percentage of annual reports studied and the absence of response bias in the questionnaire survey, it is concluded that the findings of this study are generalizable to the total population of firms issuing prospectuses containing earnings forecasts.

With respect to managerial forecast behavior, i.e. behavior during the forecast specification process, it is concluded that managerial behavior may be described as pessimistic, or conservative, and that this behavior is manifested in the underestimation of forecasted results. In 91.8% of the forecasts examined, underestimation of results was found; also 68% of the questionnaire respondents indicated that they had intentionally manipulated the forecast prior to publication. Therefore, it is concluded that the majority of firms in the United Kingdom stock exchange system that issue forecasts in prospectuses, issue a forecast that has been the subject of manipulative managerial behavior.

Where managerial forecast behavior can be described as pessimistic, it is typically not a function of the aggregate strength of the market.
Where managerial forecast behavior can be described as optimistic, the behavior appears to be, in part, a function of the general market strength.

Managerial forecast behavior is not a function of industrial classification, nor is it a function of size, where size is defined as average total assets or current year revenues; however, where size is defined as current year earnings, managerial forecast behavior does appear to be, in part, a function of firm size.

With respect to managerial behavior subsequent to forecast disclosure, it is concluded that proposition one of the theory of forecast-deviation minimization is valid only in relation to real responses. The analysis of the annual reports and of the questionnaire results indicated a very low incidence of accounting adjustments, suggesting that managers do not utilize artificial responses for the purpose of reducing forecast deviations; however, on the basis of the questionnaire survey results, it is concluded that managers do utilize real responses for the purpose of reducing forecast deviations.

Further, proposition two is concluded to be invalid for the sample studied.

To recapitulate, the two main findings of this investigation are:

1. In the majority of cases, managers intentionally manipulate the published prospectus forecast in order to insure forecast achievement.

2. Managers intentionally utilize discretionary actions, rather than accounting adjustments, to insure that prospectus forecasts are achieved within acceptable limits.

A Revised Theory of Managerial Behavior in the Prospectus Forecast Disclosure Situation

The theory of managerial behavior posited in this investigation was
that managers would intentionally underestimate the forecast to insure forecast achievement and, following forecast disclosure, behave in a manner consistent with the two propositions of the theory of forecast-deviation minimization.

On the basis of the obtained findings, a revised theory of managerial behavior may be presented. The revised theory also provides that managers will intentionally underestimate the forecast; however, following forecast disclosure, management will behave in a manner consistent with the revised theory of forecast-deviation minimization, which states:

Management will attempt to report results within a zone of acceptable values around the forecast by utilizing internal operating adjustments, i.e. by managing earnings through the use of real responses.

The revised theory consists of only a single proposition.

The revised theory reflects the finding that the two primary reasons for the observed managerial behavior, as reported by the respondents to the questionnaire, are: (1) a learned attitude of conservatism, and (2) a concern over the reaction of the business community and of the stock market if forecasts are not achieved. The implication is that environmental considerations suggested as characterizing the prospectus forecast disclosure situation are perceived by management as present and are considered to be important. A final implication concerns the "hypothesis that reported results are frequently adjusted upwards if otherwise they would fall below the forecast, but rarely downward if the forecast is exceeded;" the obtained findings indicate that the hypothesis is valid to only a slight degree and only with respect to accounting adjustments, i.e. artificial responses.

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3 Dev and Webb, p. 33.
Under the revised theory, the zone of acceptance is not taken to be constant across all firms; this result is evident from Table 21. The zone is bounded, however, as the questionnaire survey results indicated. The upper limit appears to range from 5 to 20% for the majority of firms; and the lower limit is almost certainly zero for most firms, reflecting the attitude that "public forecasts must be achieved." The implication for the managerial loss function is that, for most firms, the loss function is not symmetrical about the forecast; the lower side of the function, i.e. failure to achieve the forecast, is more heavily weighted.

Concluding Remarks and Research Recommendations

The initial impetus for this investigation can be directly traced to an earlier publication of Cooper, Dopuch, and Keller. In this article, the authors advocate budgetary disclosure on a relatively large scale, defining budgetary disclosure as "the published projection of next-period balance sheet, income and fund-flow statements and its critical comparison with actual results in a stockholders' report at the end of each period." The article was concluded by a series of recommendations, one of which suggested that an investigation be undertaken on the effects of various kinds and degrees of budgetary disclosure on managerial behavior.

The purpose of this study has been to consider one facet of the much larger investigation recommended by Cooper, et. al. Having examined the behavioral implications of but one number, earnings, from an extremely

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4Cooper, Dopuch, and Keller, P. 641.
large set of numbers, the set of financial statement numbers, the future research possibilities seem endless. Perhaps the most immediate research issue, however, is the functionality of the behavior associated with forecast disclosure.

The one indisputable conclusion that can be drawn from this study is that managers do behave differently under forecast disclosure conditions. But is this behavior functional or dysfunctional from an investor standpoint? from a firm standpoint? My own opinion is that in the short run, the type of managerial behavior observed and reported in this study will tend to be dysfunctional; the behavior is certainly not profit maximizing behavior. An investigation of the functionality of this behavior is desirable because it is not clear at this time whether the benefits of forecast disclosure outweigh the accompanying disutility in managerial behavior.

Another potential investigation concerns the manipulation of the director compensation account for the purpose of achieving the forecast. In the examination of the annual statement of accounts, an oddly recurring phenomena was observed in more than a few instances. Where reported earnings were found to be relatively numerically equal to the forecasted level of earnings, the director's emoluments account was often found to have decreased from the previous year's level; that is, where the reported results appeared too close to the forecasted level or where possibly the reported results were even below the forecasted level, the directors' emoluments account was found to be diminished from the previous year's level, perhaps for the purpose of insuring that the forecast was achieved or exceeded by the proper amount. Thus it appeared, at least superficially,
that in some firms the managers went so far as to reduce their own salaries and remuneration, at least on paper, to insure that the forecast was achieved. The probability of this occurring does not appear ridiculously low for several reasons: (1) an adjustment of this nature is not likely to be readily noticed, or if noticed, to be correlated with forecast achievement efforts; and (2) if such an adjustment were noticed, it would appear as a more noble attempt to manipulate results than the utilization of alternative accounting methods. It is possible that the observed instances of reductions in the managerial compensation accounts were merely coincidental; however, this study has shown that managers are willing to operate in unusual ways to achieve the forecast, therefore the possibility may not be so remote.
APPENDIX A

SAMPLE PROSPECTUS FORECAST
The Company and Windsor

The profits of the Company and Windsor in recent years have followed the cyclical fluctuations of the commodity markets. Rubber prices during 1959 maintained satisfactory levels, but thence declined until October, 1972. Palm oil prices also declined during this period. As a result of the decline in rubber prices, profit margins on plantations fell substantially between 1959 and 1972. Increased investment income and higher royalties from the tin tributes helped to offset the fall in plantation income in 1970 and 1971. The Company's investments were realised in 1971 and 1972 to assist in financing the construction of the new rubber factory, and the method of assessing the tin tribute was changed in 1972 from a production levy to a fixed royalty based on the acreage of land damaged. Rubber and palm oil prices have considerably improved during the last nine months. The Directors have forecast a consolidated profit of the Company and Windsor, before taxation and before charging interest on the Stock, for the year to 31st December, 1973, of £300,000. This forecast has been based on a rubber price of 50.00 Malaysian cents per lb. F.O.B. and a palm oil price of £34.50 per ton of oil palm meal. Forecasts of profits in the plantation industry are subject to fluctuations in commodity prices which can differ from month to month and to the effect of weather conditions on the crops. The assumptions on which this forecast is based are set out in full in the Section headed "Profit Forecasts" below.

BWP and BWNZ

BWP and BWNZ have maintained steady profits over the last five years. The profitability of both companies was adversely affected in the last financial year by a loss on the sale of a trade investment of BWP and by a gratuity payment to a retiring Director of BWNZ. More buoyant conditions in Australia are expected to lead to improved profits for the year to 30th June, 1973. The Directors of BWP have forecast that the consolidated profit before taxation of BWP for the year to 30th June, 1973 will be £160,000 (AS$338,000) representing an increase of approximately 44 per cent. over the profit before taxation for the year ended 30th June, 1972. In New Zealand, increased financial costs and higher taxes are expected to depress profit and the Directors of BWNZ have forecast that the consolidated profit before taxation of BWNZ for the year to 30th June, 1973, will be approximately £54,000 (NZ$103,500) representing a decrease of approximately 13 per cent. compared with the profit before taxation for the year ended 30th June, 1972.

Boustead Singapore Group

The profits of the Boustead Singapore group have benefited from the general economic progress achieved throughout South East Asia over the last five years. In 1972, the Boustead Singapore group earned a profit before taxation of approximately $250,000 (AS$514,000) of which an estimated $100,000 (AS$205,000) was exceptional profit resulting from non- recurring export business, which has not recurred in 1971. Furthermore, in 1971, profit margins on export sales increased and Boustead Engineering Pte. Limited recorded a profit of approximately $20,000 (AS$41,000) compared with a loss in 1970 of approximately $42,000 (AS$85,000). The profit before taxation for the year to 31st December, 1973, has been forecast by the Directors of BSSG at approximately $200,000 (AS$414,000).

The Group

On the basis of the above forecasts the combined profits before tax for the Group for the year ending 31st December, 1973, have been calculated at £575,000, after taking into account a half year's interest on the Stock and a tax at the prevailing rate of 60 per cent. on the proceeds of the Rights Issue, and on the basis that the rate of profit forecast for BWP and BWNZ for the year to 30th June, 1974 is maintained to 31st December, 1973.
PROFIT FORECASTS—ASSUMPTIONS AND REPORTS

The Company and Windsor

(1) Assumptions

Profit forecasts in the rubber industry (as particular businesses) as prices of the product vary considerably from month to month while the yield of revenue from crops can also be subject to unexpected variations. As an example, the net realisation of the anticipated profit for 1932 will be based on a large proportion of the 1932 crop being delivered by 31st March. Variations in the price of rubber in the forecast period may or may not be of substantial magnitude in the event that the forecast is carried out. The forecast period is a period of approximate 24 months from 1st January, 1932. The forecast is based on the latest available information and assumptions having regard to the state of demand at the different price levels.

In arriving at the forecast of profits carry forward above for the year to 31st December, 1933, of $210,000, the Directors of the Company have made the following assumptions:

1. The estimated import of rubber into the United Kingdom for 1933 will be 200,000 tons, with an average price of 40s. 6d. per pound. This assumption is based on the latest available figures and information from the rubber market.
2. In respect of the above import, 30% of the quantity will be delivered by 31st March 1933, with the remaining 70% delivered by 31st October 1933. This assumption is based on the latest available figures and information from the rubber market.
3. The price of rubber in the above import period will vary between £135 and £140 per ton, with an average price of £137.50 per ton. This assumption is based on the latest available figures and information from the rubber market.
4. The estimated export of rubber from the United Kingdom for 1933 will be 150,000 tons, with an average price of 40s. 6d. per pound. This assumption is based on the latest available figures and information from the rubber market.
5. In respect of the above export, 20% of the quantity will be delivered by 31st March 1933, with the remaining 80% delivered by 31st October 1933. This assumption is based on the latest available figures and information from the rubber market.
6. The price of rubber in the above export period will vary between £135 and £140 per ton, with an average price of £137.50 per ton. This assumption is based on the latest available figures and information from the rubber market.

(2) Report

The following is a copy of a report received from the joint Reporting Accountants, Ridley, Marsh & Co., the Company's Auditors, and Turquiss, Buxton & May, Co. Ltd.:

The Directors,

TAPING RUBBER PLANTATIONS, LIMITED.

Gentlemen,

We have had the opportunity of reviewing the forecasts of profits for the current year and the forecast for the year ending 31st December, 1933, and are able to report that the assumptions made in the forecasts appear to be reasonable. However, the Directors should be aware that the forecasts are based on certain assumptions and that the actual results may vary significantly from these forecasts.

Yours faithfully,

Ridley, Marsh Co.
TURQUISS BUXTON & MATTHEW CO.
Chartered Accountants.

London, 32nd July, 1933.

BWP

(1) Assumptions

The business is sensitive to changes in world conditions, on account of the fluctuation in prices of rubber and the corresponding exchange rates. The assumptions made in this forecast have been based on the following:

1. The world price of rubber for the year 1933 will be £135 per ton, with an average price of £137.50 per ton. This assumption is based on the latest available figures and information from the rubber market.
2. In respect of the above price, 30% of the quantity will be delivered by 31st March 1933, with the remaining 70% delivered by 31st October 1933. This assumption is based on the latest available figures and information from the rubber market.
3. The estimated export of rubber from the United Kingdom for 1933 will be 150,000 tons, with an average price of £137.50 per ton. This assumption is based on the latest available figures and information from the rubber market.
4. In respect of the above price, 20% of the quantity will be delivered by 31st March 1933, with the remaining 80% delivered by 31st October 1933. This assumption is based on the latest available figures and information from the rubber market.
5. The estimated export of rubber from the United Kingdom for 1933 will be 150,000 tons, with an average price of £137.50 per ton. This assumption is based on the latest available figures and information from the rubber market.

(2) Report

The following is a copy of the report received from Arthur Anderson & Co., BWP's Auditors:

The Directors,

BOUSETAGWOOD PROPRIETARY LIMITED.

Gentlemen,

We have had the opportunity of reviewing the forecasts of profits for the current year and the forecast for the year ending 30th June, 1932, and are able to report that the assumptions made in the forecasts appear to be reasonable. However, the Directors should be aware that the forecasts are based on certain assumptions and that the actual results may vary significantly from these forecasts.

Yours faithfully,

ARThUR ANDERSON & CO.,
Chartered Accountants.

Melbourne, 22nd July, 1932.

BWNZ

(1) Assumptions

In arriving at the forecast of profits carried forward above for the year to 30th June, 1932, of NZ$135,300 (arrival date NZ$135,000), the Directors have made the following assumptions:

1. The volume of output forecast for the financial year ended 30th June, 1933, will be 150,000 tons, with an average price of 40s. 6d. per pound. This assumption is based on the latest available figures and information from the rubber market.
2. The estimated export of rubber from New Zealand for 1933 will be 150,000 tons, with an average price of 40s. 6d. per pound. This assumption is based on the latest available figures and information from the rubber market.
3. The estimated export of rubber from New Zealand for 1933 will be 150,000 tons, with an average price of 40s. 6d. per pound. This assumption is based on the latest available figures and information from the rubber market.
4. The estimated export of rubber from New Zealand for 1933 will be 150,000 tons, with an average price of 40s. 6d. per pound. This assumption is based on the latest available figures and information from the rubber market.

(2) Report

The following is a copy of the report received from the joint Reporting Accountants, BWNZ's Auditors:

The Directors,

BOUSETAGWOOD PROPRIETARY LIMITED.

Gentlemen,

We have had the opportunity of reviewing the forecasts of profits for the current year and the forecast for the year ending 30th June, 1932, and are able to report that the assumptions made in the forecasts appear to be reasonable. However, the Directors should be aware that the forecasts are based on certain assumptions and that the actual results may vary significantly from these forecasts.

Yours faithfully,

ARThUR ANDERSON & CO.,
Chartered Accountants.

Melbourne, 22nd July, 1932.
(C) Report
The following is a copy of the Report received from Hutchinson, Hull & Co., SWNZ's Auditors—

The Directors,

BOUSTEAD WOOD (NZ) LIMITED,

Dear Sirs,

We have audited the accompanying balance sheet and profit and loss account and the notes on the accounts for the year ended 31st December 1972, and have expressed an opinion on the affairs of the company. In our opinion, the accounts have been prepared in accordance with the accounting practices normally adopted by the company and are true and fair.

Yours sincerely,

HUTCHISON, HULL & CO.
Chartered Accountants (NZ).


Boustead Singapore Group

(1) Audited Financial Statement

In accordance with the requirements of the Companies Act 1975, the Directors of Boustead Singapore Group Limited, have prepared the following accounts—

1. The accounts have been prepared in accordance with the accounting standards for the year ended 31st December 1972.

2. The accounts have been prepared in accordance with the accounting standards for the year ended 31st December 1972.

3. Goodwill has been amortized in an amount which is a reasonable amount of certain export margins of other being available.

Boustead Singapore Group Limited,
Chartered Accountants.


(2) Report

The following is a copy of the Report received from Tuckwood, Youngs & Co., the Certified Accountants on the Boustead Singapore Group.

The Directors,

BOUSTEAD TRADING (SINGAPORE) LIMITED,

Gentlemen,

We have audited the accounts and are satisfied that they present fairly the financial position of the company for the year ended 31st December 1972.

Yours faithfully,

TUCKWOOD, YOUNGS & CO.,
Certified Accountants.


The Group

The Directors,

TAIPING RUBBER PLANTATIONS LIMITED,

Gentlemen,

We refer to our letter dated 23rd July, 1973, to be published in connection with an offer of 8% preference shares.


We have audited the accounts and are satisfied that they present fairly the financial position of the company for the year ended 31st December 1972.

Yours sincerely,

ARBUCKLE & CO., LIMITED,
N. A. EDEMENT.

Director.


New Zealand.

Leaves, 149.
APPENDIX B

FORM LETTER REQUESTING ANNUAL
STATEMENT OF ACCOUNTS
Dear Sir:

My accounting classes at this university are currently studying international approaches to accounting. As such, they are interested in certain foreign companies. Shortly, we will be studying the various approaches to the issuance of new capital or the relisting of existing capital. We obtained your company's name from the Extel Book of New Issues, a publication containing copies of prospectuses. I am writing to inquire whether we may obtain a single copy, or Xerox copy, of the financial report for your company for the fiscal year ending . We will gladly repay your mailing costs if you would consider sending me the above report at your earliest convenience.

Thank you for your consideration of this request.

Sincerely,

Kenneth R. Ferris
Department of Accounting
Hagerty Hall
Ohio State University
Columbus, Ohio 43210
U. S. A.

KRF:evw
1. A. G. B. RESEARCH LIMITED
2. LEON BERNER GROUP LIMITED
3. COURT HOTELS (LONDON) LIMITED
4. HEPWORTH CERAMIC HOLDINGS LIMITED
5. J. H. VA VASSEUR AND COMPANY LIMITED
6. WILKINSON WARBURTON LIMITED
7. NORCREN SHIPSTON INTERNATIONAL LIMITED
8. DELYN LIMITED
9. WESTFORTH ELECTRICAL AND AUTOMATION LIMITED
10. VITA-TEX LIMITED
11. N. BROWN INVESTMENTS LIMITED
12. UNITED ENGINEERING INDUSTRIES LIMITED
13. KINGSLEY AND KEITH CHEMICAL GROUP LIMITED
14. NOVA (JERSEY) KNIT LIMITED
15. FEEDEX LIMITED
16. CHARLES SPRECKLEY INDUSTRIES LIMITED
17. M. K. REFRIGERATION LIMITED
18. HUNTING GIBSON LIMITED
19. BUTTERFIELD-HARVEY LIMITED
20. TEXTURED JERSEY LIMITED
21. T. P. T. LIMITED
22. HIGHLIGHT SPORTS LIMITED
23. HIGHCROFT INVESTMENT TRUST LIMITED
24. NORMAND ELECTRICAL HOLDINGS LIMITED
25. L. LIPTON LIMITED
26. SCOT MEAT PRODUCTS LIMITED
27. UNIVERSAL UNDERWEAR LIMITED
28. EXCESS HOLDINGS LIMITED
29. TRIDENT TELEVISION LIMITED
30. PILKINGTON BROTHERS LIMITED
31. JAMES NEILL HOLDINGS LIMITED
32. H. P. BULMER LIMITED
33. ABERCOM INVESTMENTS LIMITED
34. ECONOMIC GROUP LIMITED
35. BSR LIMITED
36. HUNTELEIGH INVESTMENT COMPANY LIMITED
37. CHANCEWARES LIMITED
38. PLASTIC CONSTRUCTIONS LIMITED
39. GEORGE WHITEHOUSE (ENGINEERING) LIMITED
40. TREMLETTS LIMITED
41. THE ROBERT STEWART GROUP LIMITED
42. ROBERT Mc BRIDE (MIDDLTON) LIMITED
43. BRITISH BENZOL CARBONIZING LIMITED
44. REFUGE SECURITIES LIMITED
45. OVERSEAS FINANCIAL TRUST LIMITED
46. GREENFIELD MILLETS LIMITED
47. MYSON GROUP LIMITED
48. RAY TURNER GROUP LIMITED
49. G. R. BODYCOTE (HOLDINGS) LIMITED
*50. WINTRUST LIMITED
| 1. | AMALGAMATED DISTILLED PRODUCTS LIMITED |
| 2. | BLUE CIRCLE AGGREGATES LIMITED |
| 3. | LEOPOLD JOSEPH HOLDINGS LIMITED |
| 4. | CEDAR HOLDINGS LIMITED |
| 5. | LLOYDS AND SCOTTISH LIMITED |
| 6. | BRITISH DEBT SERVICES LIMITED |
| 7. | SANDHURST MARKETING LIMITED |
| 8. | TRICOVILLE LIMITED |
| 9. | GEORGE CLARKE (MOTORS) LIMITED |
| 10. | ARMOUR TRUST LIMITED |
| 11. | FAIRVIEW ESTATES LIMITED |
| 12. | THE BURSTON GROUP LIMITED |
| 13. | M. F. I. WAREHOUSES LIMITED |
| 14. | TRANMER GROUP LIMITED |
| 15. | THE COLEY-ROTIOLN GROUP LIMITED |
| 16. | BERWICK TEMPO LIMITED |
| 17. | EVANS OF LEEDS LIMITED |
| 18. | COSALT LIMITED |
| 19. | MATTHEWS WRIGHTSON HOLDINGS LIMITED |
| 20. | NSS NEWSAGENTS LIMITED |
| 21. | LAWDON LIMITED |
| 22. | HOTHLYN CORPORATION LIMITED |
| 23. | CARBON COMPANY (HOLDINGS) LIMITED |
| 24. | RAWLINGS BROS. LIMITED |
| 25. | DAVIES & NEWMAN HOLDINGS LIMITED |
| 26. | FRANCIS PARKER LIMITED |
| 27. | ROGAN GROUP LIMITED |
| 28. | CONTINUOUS STATIONARY LIMITED |
| 29. | PORK FARMS LIMITED |
| 30. | DUNDEE, PERTH, AND LONDON SECURITIES LIMITED |
| 31. | FIDELITY RADIO LIMITED |
| 32. | BERNARD MATTHEWS LIMITED |
| 33. | OIL EXPLORATION (HOLDINGS) LIMITED |
| 34. | ARTHUR BELL & SONS LIMITED |
| 35. | LONGTON TRANSPORT (HOLDINGS) LIMITED |
| 36. | JOHN M. HENDERSON & COMPANY (HOLDINGS) LIMITED |
| 37. | TEX ABRASIVES LIMITED |
| 38. | ARLINGTON MOTOR HOLDINGS LIMITED |
| 39. | GREENBANK INDUSTRIAL HOLDINGS LIMITED |
| 40. | CRITALL-IOPE ENGINEERING LIMITED |
| 41. | MINDEN INVESTMENT TRUST LIMITED |
| 42. | CARLESS, CAPEL, AND LEONARD LIMITED |
| 43. | PEAK TRAILORS LIMITED |
| 44. | THE BRITISH STEEL PILING COMPANY (HOLDINGS) LIMITED |
| 45. | G. R. FRANCIS GROUP LIMITED |
| 46. | R. KELVIN WATSON LIMITED |
| 47. | KETTERING MOTOR SERVICE GROUP LIMITED |
| 48. | McINNERNEY PROPERTIES LIMITED |
| 49. | PLYSU LIMITED |
| 50. | ALIDA PACKAGING COMPANY LIMITED |
| 51. | EMPRESS SERVICES (HOLDINGS) LIMITED |
52. ALLIED POLYMER GROUP LIMITED
53. TOWER ASSETS LIMITED
54. M. P. KENT LIMITED
55. THE JOHN STAIT GROUP LIMITED
56. JEVONS COOPER LIMITED
57. COMMODORE SECURITIES LIMITED
58. RYAN-TRADERS DISTRIBUTION LIMITED
59. RUSH & TOMPKINS GROUP LIMITED
60. MARSHALL, MORGAN AND SCOTT LIMITED
61. REED EXECUTIVE LIMITED
62. YULE CATTO AND COMPANY LIMITED
63. HOLLAS TEXTILE HOLDINGS LIMITED
64. THE TIGON GROUP LIMITED
65. WHITE CHILD AND BENY LTD
66. FIRST UNION GENERAL INVESTMENT TRUST LIMITED
67. ORME DEVELOPMENTS LIMITED
68. N. B. H. C. HOLDINGS LIMITED
1972 FIRMS

1. GALLIFORD ESTATES LIMITED
2. McINTYRE AND SONS LIMITED
3. THOMAS LINNELL AND SONS LIMITED
4. ROYCO GROUP LIMITED
5. ANTHONY GIBBS AND SONS LIMITED
6. DARTMOUTH INVESTMENTS LIMITED
7. GARTON COOPER LIMITED
8. LIGHTING AND LEISURE INDUSTRIES LIMITED
9. HORIZON MIDLANDS LIMITED
10. MITCHELL COTTS TRANSPORT LIMITED
11. PETROCON GROUP LIMITED
12. FEDERATED LAND AND BUILDING COMPANY LIMITED
13. SILVERTHORNE GROUP LIMITED
14. EDINBURGH AND GENERAL INVESTMENTS LIMITED
15. HAWKINS AND TIPSON LIMITED
16. GLAXO HOLDINGS LIMITED
17. PEUREULA INVESTMENTS LIMITED
18. REUNION PROPERTIES COMPANY LIMITED
19. CAPLAN PROFILE GROUP LIMITED
20. THE REO STAKIS ORGANIZATION LIMITED
21. S. LYLES LIMITED
22. FORD AND SLATER HOLDINGS LIMITED
23. GREENSQUARE PROPERTIES LIMITED
24. LEISURE CARAVAN PARKS LIMITED
25. INTER-CITY INVESTMENT GROUP LIMITED
26. ALBERT MARTIN HOLDINGS LIMITED
27. COMBEN AND WAKELING LIMITED
28. J. F. NASH SECURITIES LIMITED
29. MOTHERCARE LIMITED
30. SLYTONE LIMITED
31. GOUGH BROTHERS LIMITED
32. JOHN STEPHEN OF LONDON LIMITED
33. KCA DRILLING GROUP LIMITED
34. AUDIOTRONIC HOLDINGS LIMITED
35. STAG FURNITURE HOLDINGS LIMITED
36. BOOTH (INTERNATIONAL HOLDINGS) LIMITED
37. NEWARTHILL LIMITED
38. BRIDGEND INVESTMENTS LIMITED
39. UNERMAN HOLDINGS LIMITED
40. THE STIRLING CREDIT GROUP LIMITED
41. HARTLEY INDUSTRIAL TRUST LIMITED
42. WRENSONS STORES LIMITED
43. GRAY ELECTRONICS LIMITED
44. LUIS GORDON GROUP LIMITED
45. STATUS DISCOUNT LIMITED
46. J. W. PICKLES AND SONS LIMITED
47. FOOTWEAR INDUSTRY INVESTMENTS LIMITED
48. ANSTON HOLDINGS LIMITED
49. W. W. HALL LIMITED
1972 FIRMS (CONTINUED)

50. MONTAGUE BURTON PROPERTY INVESTMENTS LIMITED
51. LION INTERNATIONAL LIMITED
52. PETBOW HOLDINGS LIMITED
53. ALDERMAN SECURITIES GROUP LIMITED
54. CHRISTIE-TYLER LIMITED
55. HAROLD PERRY MOTORS LIMITED
56. THE BEAUFORD GROUP LIMITED
57. DOM HOLDINGS LIMITED
58. KNOTT MILL HOLDINGS LIMITED
59. ROSGILL HOLDINGS LIMITED
60. DALE ELECTRIC INTERNATIONAL LIMITED
61. THE CAWENDISH LAND COMPANY LIMITED
62. AMALGAMATED INDUSTRIALS LIMITED
63. COHEN BROS. (ELECTRICAL) LIMITED
64. PETERS STORES LIMITED
65. VICTOR PRODUCTS (WALLSEND) LIMITED
66. GOUGH COOPER AND COMPANY LIMITED
67. PETER PLACK HOLDINGS LIMITED
*68. JOVIEL PROPERTIES LIMITED
69. COUNTRYSIDE PROPERTIES LIMITED
70. BATLEYS OF YORKSHIRE LIMITED
71. CARR'S MILLING INDUSTRIES LIMITED
72. COUNTRY AND DISTRICT PROPERTIES LIMITED
73. THE SOLICITOR'S LAW STATIONARY SOCIETY LIMITED
74. HOME CHARM LIMITED
75. ORCHARD HOUSE PROPERTY HOLDINGS LIMITED
76. STANNEYLANDS GROUP LIMITED
*77. THE GRAHAM WOOD STEEL GROUP
78. CRANLEYGH GROUP LIMITED
79. ALPINE SOFT DRINKS LIMITED
80. REGALIAN PROPERTIES LIMITED
81. WESTERN BOARD MILLS LIMITED
82. FORUM PROPERTIES LIMITED
83. PERCY BILTON LIMITED
84. ELSWICK-HOPPER LIMITED
85. THE WOODMILL PROPERTY GROUP LIMITED
86. GRANLEY SECURITY GROUP LIMITED
87. CHARLES HURST LIMITED
88. MARSHALL CAVENDISH LIMITED
89. LONDON, AUSTRALIAN AND GENERAL EXPLORATION COMPANY LIMITED
90. CAMFORD ENGINEERING LIMITED
91. GRIMSHAW HOLDINGS LIMITED
92. JANELLE LIMITED
93. PERCY LANE GROUP LIMITED
94. READY MIX LIMITED
95. A. G. STANLEY HOLDINGS LIMITED
96. NORMAN HAY LIMITED
97. BELLMOOR INVESTMENT TRUST LIMITED
*98. WARD HOLDINGS LIMITED
99. HAMMA INVESTMENTS LIMITED
100. I. J. DEWHIRST HOLDINGS LIMITED
101. COMET RADIOVISION SERVICES LIMITED
102. R. T. INVESTMENTS LIMITED
| 1.  | COMPTON PARTNERS LIMITED                      |
| 2.  | LYNDALE ENGINEERING LIMITED                 |
| 3.  | W. VINTEN LIMITED                           |
| 4.  | KWIKFORM LIMITED                            |
| 5.  | EDWARD BATES AND SONS (HOLDINGS) LIMITED    |
| 6.  | AMALGAMATED DISTILLED PRODUCTS LIMITED       |
| 7.  | GRAFF DIAMONDS LIMITED                      |
| 8.  | STIRLING KNITTING GROUP LIMITED             |
| 9.  | LONDON BRIDGE SECURITIES LIMITED            |
| 10. | FRATERNAL ESTATES LIMITED                   |
| 11. | ALPINE HOLDINGS LIMITED                     |
| 12. | WOODROW WYATT HOLDINGS LIMITED              |
| 13. | SILENTNIGHT HOLDINGS LIMITED                |
| 14. | CENTREWAY SECURITIES LIMITED                |
| 15. | TYSONS (CONTRACTORS) LIMITED                |
| 16. | GOLDRING LIMITED                            |
| 17. | CRELLON HOLDINGS LIMITED                    |
| 18. | TRANWOOD LIMITED                            |
| 19. | PARTRIDGE AND LOVE (HOLDINGS) LIMITED       |
| 20. | AMBERDAY HOLDINGS LIMITED                   |
| 21. | FERGUSON INDUSTRIAL HOLDINGS LIMITED         |
| 22. | RENNIES CONSOLIDATED HOLDINGS LIMITED       |
| 23. | COX INDUSTRIES LIMITED                      |
| 24. | STRoud RILEY DRUMMOND LIMITED               |
| 25. | R. P. MARTIN AND COMPANY LIMITED            |
| 26. | PARK PLACE INVESTMENTS LIMITED              |
| 27. | VIBROPLANT HOLDINGS LIMITED                 |
| 28. | THE DERRITRON GROUP                         |
| 29. | MANSON FINANCE TRUST LIMITED                |
| 30. | W. low AND COMPANY LIMITED                  |
| 31. | BEJAM GROUP LIMITED                         |
| 32. | SMITH BROS., LIMITED                        |
| 33. | C. H. BEAZER (HOLDINGS) LIMITED             |
| 34. | B. G. SECURITIES LIMITED                    |
| 35. | ADDA HOTELS (LONDON) LIMITED                |
| 36. | ADDA INTERNATIONAL LIMITED                  |
| 37. | ANDREW R. FINDLAY GROUP LIMITED             |
| 38. | LOOKERS LIMITED                             |
| 39. | LEY'S FOUNDRARIES AND ENGINEERING LIMITED   |
| 40. | CHRISTIES INTERNATIONAL LIMITED             |
| 41. | ROLLS-ROYCE MOTORS HOLDINGS LIMITED         |
| 42. | THE JONES GROUP LIMITED                     |
| 43. | FARM FEED HOLDINGS LIMITED                  |
| 44. | WINSTON ESTATES LIMITED                     |
| 45. | MACFARLANE GROUP (CLANSHAN) LIMITED          |
| 46. | KAPP AND MAISTER HOLDINGS LIMITED           |
| 47. | MORE O'FERRALL LIMITED                      |
| 48. | POPE AND PEARSON LIMITED                    |
| 49. | GOLD CROSS HOSPITAL SUPPLIES LIMITED        |
50. ALGINATE INDUSTRIES LIMITED
51. DWEK GROUP LIMITED
52. A. R. V. HOLDINGS LIMITED
53. PRINCE OF WALES HOTEL COMPANY
54. HANOVER GRAND LIMITED
55. TAIPING RUBBER PLANTATIONS LIMITED
56. HUNTLIEGH INVESTMENTS COMPANY LIMITED

*indicates that the firm made two forecasts of earnings, one for the current fiscal period and one for the following fiscal period.
APPENDIX D

FORM LETTERS FOR QUESTIONNAIRE SURVEY
The Ohio State University

November 16, 1973

Dear Sir:

As part of my dissertation for the Doctor of Philosophy degree in Accounting at the Ohio State University, U.S.A., I am conducting a study of the effects of financial forecasting on managerial behavior. This study entails a survey of companies that have made public financial forecasts within the past year. Your company was selected because of the financial forecast provided in the prospectus published in the Financial Times on

The purpose of this letter is to inquire as to whether you would be willing to participate in this study. Participation entails simply the completion of a questionnaire which will be mailed to you at a later date. Should you decide to participate, I can guarantee that your responses will be held in absolute confidentiality and that neither your name nor that of your company will appear in any way in the final written product of this survey.

It is doubtful that you or your company will derive any material benefits from this study; however, your participation may lead to an enlightenment of some of the real and potential problems that managements may be facing as a consequence of public financial forecasting. The only certain remuneration for your participation that I can guarantee is a copy of the results.

In an effort to establish the legitimacy of this letter and my research efforts, I have enclosed a brief letter of verification from my advisor, Professor Thomas J. Burns.

Before closing I would like to emphasize one point: your participation in this study is essential to its success in that only those persons actually subject to a forecast situation, like yourself, can provide the data necessary for the study. Regardless of your decision as to participation, please fill-out and return to me the enclosed, self-addressed card; the attached International Reply Coupon may be exchanged for a first-class postage stamp at any postal station.
November 12, 1973

To Whom It May Concern:

This is to certify that Mr. Kenneth Ferris, a doctoral candidate in accounting at this institution is undertaking his dissertation research on the subject of earnings forecasts.

Very truly yours,

Thomas J. Burns
Professor and Dissertation Advisor

TJB:gi
Mr. Kenneth R. Ferris  
Department of Accounting  
Hagerty Hall  
The Ohio State University  
Columbus, Ohio 43210

Dear Mr. Ferris:

In November 1973, I wrote inquiring whether or not you would be willing to participate in a questionnaire study that I would be conducting as part of my dissertation for the Doctor of Philosophy degree in Accounting at The Ohio State University, U.S.A. Your response was affirmative.

The questionnaire has now been completed and a copy is enclosed. As you may recall, the study is an attempt to examine the effects of financial forecasting on managerial behavior in companies that have made public financial forecasts within the past year. Your company was selected because of the financial forecast provided in the prospectus published in The Financial Times on March 1, 1974.

Your responses will be held in absolute confidentiality and neither your name nor that of your company will appear in any way in the final written product of this survey.

I have tried to make the questions as clear in meaning as possible. Some questions, however, may request information that you may not immediately recall. Please feel free to consult others on these questions, but I sincerely hope that you will fill out the questionnaire yourself.

If possible, I would very much appreciate receiving the completed questionnaire within the next three weeks.

Thank you for your help in this research effort.

Sincerely,

Kenneth R. Ferris  
Department of Accounting  
The Ohio State University

KRF/evw

Enclosure
Dear Sir:

On March 8, 1974, I sent to you a copy of a questionnaire that you previously agreed to complete. I have not yet received your completed questionnaire, hence I am writing to remind you. It is possible that either the questionnaire has gotten lost in the mails or you may have mislaid it. In either case, I have enclosed another copy of the questionnaire for your convenience.

I would very much appreciate receiving your completed questionnaire at your earliest possible convenience. I have enclosed a self-addressed envelope and, upon receipt of your questionnaire, will send you a draft for your postage costs.

I thank you for your time and consideration in this research effort.

Sincerely,

Kenneth R. Ferris
Department of Accounting
Ohio State University

KRF: eww

encl. 1. questionnaire
2. letter of March 8
APPENDIX E

QUESTIONNAIRE

165.
Introduction

The following questionnaire is part of a larger research project concerning financial forecasts and the effects of financial forecasting on managerial behavior. This questionnaire is concerned only with financial forecasts as provided in prospectuses; hence, while your organization may engage in other forms of financial forecasting, please restrict your responses to your organization's prospectus forecasting practices. Your company was selected for participation in this study because of the financial forecast that it provided in the prospectus published in The Financial Times during this past year.

It is important that you complete all of the questions. Pretesting of the questionnaire indicated that it can be completed in 40 to 60 minutes.

The questionnaire consists of two parts. Part one requests general and specific information about the company. Part two addresses itself to specific activities regarding the forecast and to your own attitudes and opinions. Should you desire to comment further on any of the questions, please write on the reverse side and indicate the question number to which your comments apply.

If for any reason a question is unclear, please so indicate in the margin beside the question number.

In a very few questions, a written response is requested; please write or print as legibly as possible.

Your replies will remain strictly anonymous, so please do not identify yourself on the questionnaire or on the envelope enclosed for its return.

For this survey, a "financial forecast" is defined as follows:

a projection or estimate of next period's profit from operations; such forecasts need not be stated as an exact amount, but merely need imply to a reasonable person some specific amount.

Your cooperation is earnestly requested to make the research successful and useful. Please consider each question carefully and separately.

Thanking you in advance,

Kenneth R. Ferris
Department of Accounting
The Ohio State University
Columbus, Ohio, 43210
U.S.A.
CONFIDENTIAL QUESTIONNAIRE

PART I

Section A: Background Information (Please legibly print your responses!)

1. What is the title of your current position in the company? (Fill-in)

2. Under which of the following categories would you classify your company?

   - Beers, Wines, and Spirits
   - Building Industry, Timber and Roads
   - Chemicals, Plastics, etc.
   - Cinemas, Theatres, and T.V.
   - Drapery and Stores
   - Electrical and Radio
   - Engineering and Metals
   - Food, Groceries, etc.
   - Hotels and Caterers
   - Industrials - Miscellaneous
   - Machine Tools
   - Motor, Aircraft Trades
   - Newspapers, Publishers
   - Paper, Printing, Advertising
   - Property
   - Shipbuilders, Repairers
   - Shipping
   - Shoes and Leather
   - Textiles
   - Tobaccos
   - Trusts, Finance, Land
   - Oils
   - Rubber and Sisal

   Other (please specify)

3. List all persons (please identify by job title and not name), including yourself if appropriate, that participated in the development of the prospectus forecast:

1. 
2. 
3. 
4. 
5. 
6. 
7. 
8. 
9. 
10. If this space is insufficient, please continue on reverse side.
4. It is virtually impossible to forecast exactly the results of the future; what range of accuracy does your company consider acceptable?

Check one:  

\[\begin{array}{cccc}
\downarrow & 1\% & \uparrow & 11\% \\
\downarrow & 2\% & \uparrow & 12\% & \text{Other (Please specify)} \\
\downarrow & 3\% & \uparrow & 13\% \\
\downarrow & 4\% & \uparrow & 14\% \\
\downarrow & 5\% & \uparrow & 15\% \\
\downarrow & 6\% & \uparrow & 16\% \\
\downarrow & 7\% & \uparrow & 17\% \\
\downarrow & 8\% & \uparrow & 18\% \\
\downarrow & 9\% & \uparrow & 19\% \\
\downarrow & 10\% & \uparrow & 20\% \\
\end{array}\]

5. Does your company utilize the profit forecasts of other companies in an effort to uncover their future operating plans?

Check one:  

\[\begin{array}{c}
\text{Frequently} \\
\text{Fairly often} \\
\text{Occasionally} \\
\text{Rarely} \\
\text{Never} \\
\end{array}\]

6. Do you agree that the publication of profit forecasts in the news media damages your company's competitive position?

Check one:  

\[\begin{array}{c}
\text{Strongly agree} \\
\text{Agree} \\
\text{Undecided} \\
\text{Disagree} \\
\text{Strongly disagree} \\
\end{array}\]

7. Do you agree that publishing profit forecasts undermines the motivational effects of internal budgets?

Check one:  

\[\begin{array}{c}
\text{Strongly agree} \\
\text{Agree} \\
\text{Undecided} \\
\text{Disagree} \\
\text{Strongly disagree} \\
\end{array}\]
8. Do you agree that there are significant pressures existing upon your company to insure that the forecasted level of results is achieved?

Check one: _____ Strongly agree
           _____ Agree
           _____ Undecided
           _____ Disagree
           _____ Strongly disagree

9. Did your company publicly update or revise the forecast originally issued with the prospectus?

Check one: _____ No
           _____ Yes; please specify the number of revisions: __________.

If your answer was NO, skip to question 11.

10. What was the revised forecast?

(If a specific level of profits was stated in the revised forecast, please indicate that number.)

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

11. Did any significant events affecting profits occur during the period which were not accounted for in the prospectus forecast?

Check one: _____ None
           _____ Few
           _____ Many

Section B:

1. Does your company prepare an operating budget on a periodic basis (annual, semi-annual, bi-annual, etc.)?

Check one: Yes _____
           No _____

If your answer was NO, skip to question 5.
2. Was the forecast provided in the prospectus numerically equivalent to the internal forecast contained in the operating budget?

Check one: Yes _____
No _____

If your answer was Yes, skip to question 5.

3. How did the prospectus forecast compare to the internal forecast?

The prospectus forecast was _______________ the internal forecast.

Check one: _____ significantly greater than
            _____ slightly greater than
            _____ slightly less than
            _____ significantly less than

4. By what percent (%) did the prospectus forecast deviate from the internal forecast?

Check one: 1% _____ 6% _____ 11% _____
           2% _____ 7% _____ 12% _____
           3% _____ 8% _____ 13% _____
           4% _____ 9% _____ 14% _____
           5% _____ 10% _____ 15% _____

    Other (please specify) ____________%.

5. At the time the forecast was published in the prospectus, did you consider the prospectus forecast to be

Check one: _____ Very optimistic
            _____ Optimistic
            _____ Realistic
            _____ Pessimistic
            _____ Very pessimistic

If your answer was REALISTIC, skip to question 10.

6. At the time the forecast was made, was the forecast intentionally over or under-stated?

Check one: Yes _____
No _____
7. At the time the forecast was made, by what percent (%) was the forecast over or under-stated?

Check one: 1% ___ 13% ___ 25% ___
2% ___ 14% ___
3% ___ 15% ___ More than 25% ___
4% ___ 16% ___
5% ___ 17% ___
6% ___ 18% ___
7% ___ 19% ___
8% ___ 20% ___
9% ___ 21% ___
10% ___ 22% ___
11% ___ 23% ___
12% ___ 24% ___

8. What was the main reason(s) for intentionally over or under-stating the prospectus forecast?

(Please be specific and please print legibly.)

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

9. Do you agree that there is a conflict between management ethics and the over or under-statement of financial forecasts?

Check one: ___ Strongly agree
___ Agree
___ Undecided
___ Disagree
___ Strongly disagree

10. At the time the forecast was published in the prospectus, did you consider the assumptions underlying the forecast to be

Check one: ___ Very optimistic
___ Optimistic
___ Realistic
___ Pessimistic
___ Very Pessimistic
11. If the period covered by the forecast issued in the prospectus has ended, answer questions A and B; if the period covered by the forecast has not ended, answer questions C and D.

The forecast period has ended:

A. How did the forecast compare with actual results?
   Check one: ____ Forecast exceeded actual results.
   ____ Forecast equaled actual results.
   ____ Actual results exceeded forecast.

B. What, if any, was the numerical difference between the forecasted level and the actual level of results?

The forecast period has not ended:

C. How do you feel that actual results will compare with the forecast?
   Check one: ____ Forecast will exceed actual results.
   ____ Forecast will equal actual results.
   ____ Actual results will exceed forecast.

D. What, if any, numerical difference do you expect to occur between actual results and forecasted results?

If your answer to question 11 part A was "Forecast equaled actual result," OR if your answer to question 11 part C was "Forecast will equal actual results," please skip to question 14.

12. On the scale below, please indicate (by placing an X on the line) the extent to which you feel that the failure of the assumptions underlying the prospectus forecast to be fulfilled was the reason why the forecast did not (or will not) equal the actual results?

   0 1 2 3 4 5 6 7 8 9 10

   The failure of the assumptions underlying the forecast were not (will not be) the cause of the forecast deviation.
   The failure of the assumptions underlying the forecast were (will be) the cause of the forecast deviation.

13. What percentage of the deviation between forecasted and actual results do you feel can be attributed to the failure of the assumptions underlying the forecast?

   %
14. My company would consider the forecast to have been achieved if actual results are no more than ____% above the forecasted level of results. (please fill in)

15. Did your company utilize a "contingency discount" in the determination of the prospectus forecast, i.e., a discount that is applied to the realistic forecast to produce the figure that will actually be issued in the prospectus?

Check one: Yes ____
No ____

If your response was NO, skip to question 17.

16. What percent was the "contingency discount"

______% 

17. Did your company include "correction factors" in the forecast, i.e., factors intended to prevent any deviation of the actual results from the forecasted levels?

Check one: Yes ____
No ____

18. My company would consider the forecast to have been achieved if actual results are no more than ____% below the forecasted level of results. (please fill in)

Section C:

1. How important do you feel it is to achieve the forecast?

Check one: ____ Extremely important
____ Somewhat important
____ Important
____ Not very important
____ Extremely unimportant

2. Did your concern for achieving the forecast ever consciously influence the operating decisions that you made during the period covered by the forecast?

Check one: ____ Frequently
____ Fairly often
____ Occasionally
____ Rarely
____ Never

If your response was not NEVER, please give one example:
3. Has your company ever consciously attempted to alter any decision or activity for the purpose of reducing the expected deviation of actual results from the forecasted results?

Check one: 

- Frequently
- Fairly often
- Occasionally
- Rarely
- Never

If your response was not NEVER, please give one example:

________________________________________________________________________________________

________________________________________________________________________________________

________________________________________________________________________________________

4. Has your company ever utilized alternative accounting methods for the express purpose of reducing the expected deviation between actual and forecasted results?

Check one: 

- Frequently
- Fairly often
- Occasionally
- Rarely
- Never

If your response was not NEVER, please give one example:

________________________________________________________________________________________

________________________________________________________________________________________

________________________________________________________________________________________

5. Has your company ever failed to undertake a change in accounting method because of the adverse effect of such a change on the expected deviation between actual and forecasted results?

Check one: 

- Frequently
- Fairly often
- Occasionally
- Rarely
- Never
6. Has your company ever attempted to adjust any accounting records for the express purpose of reducing the expected deviation between actual and forecasted results?

Check one: _____ Frequently
_____ Fairly often
_____ Occasionally
_____ Rarely
_____ Never

7. Has your company ever adjusted profit upward in an effort to achieve a forecast?

Check one: _____ Frequently
_____ Fairly often
_____ Occasionally
_____ Rarely
_____ Never

8. Has your company ever adjusted profit downward in an effort to achieve a forecast?

Check one: _____ Frequently
_____ Fairly often
_____ Occasionally
_____ Rarely
_____ Never

9. Has the management ever pursued any operating policies expressly directed at minimizing the expected deviation between actual and reported results?

Check one: _____ Frequently
_____ Fairly often
_____ Occasionally
_____ Rarely
_____ Never

If your response was not NEVER, please give one example:

_________________________________________________________________________
_________________________________________________________________________
_________________________________________________________________________
_________________________________________________________________________
10. Has there ever been any attempt to suppress profits or avoid expenditures in an effort to reduce expected deviations between actual and forecasted results?

Check one:  

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequently</td>
<td>Fairly often</td>
<td>Occasionally</td>
</tr>
<tr>
<td></td>
<td>Rarely</td>
<td>Never</td>
<td></td>
</tr>
</tbody>
</table>

PART II

The following part of the questionnaire consists of a list of statements. You are requested to indicate the extent to which you agree with those statements; your response will be one of the following:

Agree strongly
Agree
Undecided
Disagree
Disagree strongly

Throughout this section of the questionnaire the term "Forecast Variance" is frequently used; to avoid confusion over its meaning, a commonly utilized definition is provided.

**Forecast Variance:** A difference between forecasted results and actual results, i.e., either the forecast is greater than actual results, or vice versa.

Place a mark in the box (to the right of each statement) which best describes your belief regarding the statement. Be sure to complete all the items. Your responses cannot be used if any items are not marked.

<table>
<thead>
<tr>
<th></th>
<th>Strongly</th>
<th>Agree</th>
<th>Undecided</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I was responsible for developing the forecast.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. I played a major role in the preparation of the forecast.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Special problems that I mentioned received special treatment during the preparation of the forecast.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. The forecast included changes that I suggested.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. The forecast was completely consistent with my own beliefs about the company's future operations.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. The forecast was easily achievable.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. The forecast was set too high to achieve without special effort by the management.</td>
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8. It is difficult to forecast future activity levels in this company.

9. The forecast was or could be changed to reflect unexpected changes in the company's operating conditions.

10. I have attended company meetings where the importance of achieving the forecast was discussed.

11. I have attended company meetings in which a discussion of ways to avoid forecast variances was conducted.

12. I have received reports comparing actual operating results with the forecasted operating results.

13. Forecast variances have been mentioned during performance evaluation interviews.

14. I have expressed dissatisfaction to some of my subordinate members of management concerning apparent forecast variances.

15. I have received telephone calls on forecast variance matters from other members of the company management.

16. I have consulted other members of the company management about increasing or decreasing output in order to achieve the forecasted goal.

17. I have spoken to the company's top advisors on matters concerning forecast variances.

18. Stockholders will evaluate my performance by comparing the company's actual performance with the forecasted performance.

19. The investing public views a forecast revision as a sign of poor management.

20. Forecast variances adversely affect the credibility of management in the eyes of the investing public.
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<tr>
<td>21. It is difficult to explain forecast variances to investors.</td>
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<td>22. Investors misinterpret forecasts.</td>
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<td>23. Investors will react unfavorably to intentional overstatement of forecasts.</td>
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<td>24. Investors will react unfavorably to intentional understatement of forecasts.</td>
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<td>25. Investors will criticize management when forecasts variances occur.</td>
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<td>26. Investors regard forecasts as guarantees of performance by the company.</td>
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<td>27. Investors evaluate management on their ability to achieve forecasts.</td>
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<td>28. The company has an obligation to investors to insure that forecasts are attained.</td>
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<td>29. A failure to attain a forecast would severely reduce the investing public's confidence in the company.</td>
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<td>30. I have received letters from stockholders regarding forecast variances.</td>
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<td>31. Investors place unwarranted confidence in the accuracy of prospectus forecasts.</td>
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<td>32. The forecast is an extremely important factor in the investor's investment decision.</td>
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<td>33. Investors will misinterpret any forecast variance.</td>
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<td>34. Forecast variances will result in a loss of reputation for the company and management.</td>
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<td>35. Investors view the ability to achieve forecasts as more important than the company's previous operating record.</td>
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<td>Statement</td>
<td>Strongly Agree</td>
<td>Agree</td>
<td>Undecided</td>
<td>Strongly Disagree</td>
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<td>--------------------------------------------------------------------------</td>
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<td>36. If the forecast is not met, the company may be subject to legal proceedings by investors.</td>
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<td>37. Forecast variances adversely affect the price of a company's stock.</td>
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<td>38. Minimizing forecast variances is important to maintain a stable stock price.</td>
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<td>39. Failure to achieve forecasts will affect the cost of raising capital in the future.</td>
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<td>40. Forecast variances are certain to lead to critical comments by financial analysts regarding the effectiveness of this company's management.</td>
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<td>41. I have made operating decisions on the basis of their effect on forecast variances.</td>
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<td>42. I have suggested that the short-run performance of the company be altered to help reduce forecast variances.</td>
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<td>43. I have suggested the use of alternative accounting methods as a means to reduce potential forecast variances.</td>
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<td>44. I am reluctant to undertake certain risks that might otherwise be undertaken because of my concern for minimizing the forecast variance.</td>
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<td>45. I am responsible for forecast compliance.</td>
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<td>46. Minimizing the forecast variance is extremely important to me.</td>
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<td>47. Forecast variances adversely affect my job security.</td>
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<td>48. It is extremely important to insure that actual results do not significantly fall below the forecasted level of results.</td>
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<tr>
<td>49. It is extremely important to insure that actual results do not significantly exceed the forecasted level of results.</td>
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50. Forecasting limits management flexibility and prerogatives in operations.
APPENDIX F

ANALYSIS OF ACCOUNTING CHANGES

Under British accounting practices there is considerable flexibility as to where certain items are reported. Exceptional or non-recurring items and the effects of changes in accounting bases may be reported in the Profit and Loss Account or as a direct adjustment to reserves\(^1\) on the Balance Sheet. The Companies Act of 1967, however, requires that any such change or adjustment be separately disclosed and that "particulars" be given regarding the item.

Given this flexibility in reporting, if a firm desired to report a certain profit figure, it could exercise its discretion as to where to report such items or whether to change its basis of accounting. It is difficult, though, to discern the true managerial intention or motivation behind such accounting treatment. Therefore it was necessary to assume that such accounting changes were not part of management's operating plan at the time of forecast preparation. Operationally, accounting adjustments and changes documented in the prospectus were not considered in determining reported earnings prior to adjustment; only those adjustments

\(^1\) For example, a firm could charge an exceptional loss straight to reserves, thus bypassing the Profit and Loss Account.
and changes not indicated in the prospectus, and therefore presumably not part of the operating plans at the time of forecast specification, were considered in the restatement of earnings.

The process of examining the reported results for evidence of adjustments aimed at reducing forecast deviations proceeded as follows. First, those companies whose reported and forecasted profits were not comparable due to mergers or take-overs not allowed for in the forecast were eliminated from the study. For each of the remaining firms the following annual report items were examined: auditor's report, listing of accounting principles followed, Profit and Loss Account, Balance Sheet, and notes to the financial statements. Evidence for primarily two types of accounting "adjustments" was examined for: (1) changes in accounting basis, i.e., inventory valuation method or depreciation method; and (2) inconsistent treatment of special items, i.e., exceptional, non-recurring, and prior-year items. Since the basic data unit was "profits," only adjustments that could affect that number were considered.

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2 The terminology "forecast deviation" is used to refer to any numerical difference between actual and forecasted results, regardless of whether actual exceeded forecasted results, or vice versa.

3 "Inconsistent treatment" refers to handling an item in one manner one period and handling the same or similar item in a different fashion in the next period. For example, accounting for an item through the Profit and Loss Account one period and through reserves in the following period. In a few cases no basis of comparison existed. In those cases an arbitrary decision was made as to whether the adjustment could have been handled in a more "appropriate" manner; the decision as to "appropriateness" was made in light of the materiality of the item, the effect of the item on forecast deviation, and the manner in which the item was most commonly handled by British firms according to the Survey of Published Accounts 1971-1972, The Institute of Chartered Accountants in England and Wales.
APPENDIX G

ANALYSIS OF PART ONE OF QUESTIONNAIRE

This appendix contains an explanation of the purpose of each individual question in part one of the questionnaire.

Section A

Question one was aimed at describing the questionnaire respondent, while question two sought to describe the respondent's firm; the information provided by question two was used for the purpose of describing the questionnaire sample. Question three attempted to ascertain exactly who was responsible for developing the forecast; when combined with question one, it was possible to determine whether or not the questionnaire was completed by an individual involved in the forecast development process. Question four was directed at establishing the zone of acceptance for each firm; this information was also used in generating a zone of acceptance that was generalized across the other firms of sample years 1970 through 1972. Questions five, six, and seven examined three commonly suggested consequences of forecast disclosure; the questions were not totally relevant to the study but served the end of stimulating respondent interest and emotion. Question eight provided a means to validate the measurement obtained in part two of the questionnaire; by correlating 184.
the response in question eight with the index produced in part two, some indication regarding the consistency of the respondent's answers throughout the questionnaire could be obtained.

Questions nine, ten, and eleven were directed at possible alternative explanations of the findings. If a revision of the forecast occurred (questions nine and ten), there may exist little need for management to alter either accounting policies or operating decisions, and hence the pressures to adjust results may be radically diminished. Or, if forecast deviations are present, to what extent are they perceived to be caused by uncontrollable external events (question eleven).

Section B

Questions one through four attempted to determine how the published prospectus forecast compared to management's own expectations, presumably represented by the internal forecast of operations; such information could suggest the extent to which management felt it wise to overestimate or underestimate the forecast, for whatever underlying purpose. Questions five through eight openly confronted the respondent with the questions raised in phase one of the study methodology: did management intentionally overestimate or underestimate the forecast, and by how much? This information was used to confirm or reject the findings of phase one. Question nine closely followed in logic the previous four questions by asking management to indicate whether they perceived such managerial behavior to be ethically acceptable or not.

Questions ten, twelve, and thirteen essentially repeated the intent of questions five and six but from the standpoint of the assumptions underlying the forecast, i.e. to what extent were the assumptions
manipulated. Question eleven generated the data to test proposition two (by correlating that response with the measure of forecast-induced pressure obtained in part two); also, by comparing the response to question eleven with the actual ex post data obtained from the annual statement of accounts, another consistency check of the respondent's answers was available. Questions fourteen and eighteen provided a verification check on the response to question four of Section A, the zone of acceptance for the firm. And questions fifteen, sixteen, and seventeen were directed at further developing the results to questions six through eight.

Section C

Section C had but one purpose: to determine whether management utilized any accounting expediences or discretionary actions for the purpose of minimizing forecast deviations. Questions one through three, nine and ten inquired about the effect of forecast deviations on operating policies and decisions. Questions four through eight examined the use of accounting adjustments.
SELECTED BIBLIOGRAPHY


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