

FOREWORD

The Securities Commission commissioned Mr Y T Mak of the Accountancy Group, Victoria University of Wellington to carry out a comprehensive study of profit forecasts in prospectuses for equity securities registered with the Registrar of Companies since the Securities Regulations 1983 came into force on 1 September 1983.

Initially, the intention was to investigate the accuracy and bias of the profit forecasts. However, it soon became clear that focussing on these characteristics of profit forecasts alone would be too narrow. The study was therefore broadened to examine formally the level of detail of profit forecast information and the extent to which management provided explanations for deviations between forecast and actual profit.

We have found that profit forecasts in prospectuses were often highly optimistic and in many cases quite inaccurate. However, other problems with the disclosure of profit forecasts also became apparent. Some companies failed to disclose adequately the accounting policies used in preparing profit forecasts. Others included forecasts for periods which did not correspond to formal reporting periods. Assumptions were often unclear. Many companies did not explain deviations between forecast and actual profit in their annual reports.

The report is first and foremost a research report of an empirical study of profit forecasts in New Zealand equity prospectuses. The suggestions on reform reflect the author's views only and are not necessarily the views of the Commission. Nevertheless it is intended to provide a useful starting point for policy makers, including the Commission, contemplating the need for reform.

The report is divided into two parts. Part I summarises the major findings and policy recommendations of the study and is written in a non-technical manner. Part II contains the full report and requires some knowledge of statistics and the research process.

The Commission would like to thank Mr Mak and his colleagues at the University for their considerable efforts in producing the report.

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**AN EXAMINATION OF PROFIT FORECAST DISCLOSURE
IN NEW ZEALAND PROSPECTUSES**

PART I

SUMMARY REPORT

1. SUMMARY AND DISCUSSION OF MAJOR FINDINGS

This study examined the disclosure of profit forecasts in N.Z. prospectuses for initial public offerings of equity securities issued by companies which subsequently listed on the N.Z Stock Exchange. Using a comprehensive sample of 82 prospectuses (141 forecasts) published from 1 September 1983 through to late 1987, the accuracy and bias of profit forecasts, level of detail of profit forecast information, and the extent to which management explained deviations between forecast and actual profit in annual reports, were examined. The major findings are:

1.1. Forecast Accuracy and Bias

1.1.1. About 14% of N.Z. forecasts had forecast deviations (i.e. differences between forecast profit and actual profit) of less than $\pm 10\%$, while more than 35% of these forecasts had forecast deviations of greater than $\pm 100\%$. The average deviation was just under $\pm 70\%$. Therefore, on average, N.Z. forecasts were not very accurate. A comparison with the findings from a recent Australian study shows that N.Z. forecasts were less accurate than Australian forecasts.

1.1.2. The percentage of forecasts not achieved was just under 50% (that is, about as expected if there is an equal probability of a forecast being exceeded or not achieved). However, a relatively large proportion of actual results fell **below** forecast profits by more than 100%.

1.1.3. While the significant changes in the economic environment in N.Z. in recent years may have contributed to the large proportion of highly inaccurate and optimistic forecasts, it is doubtful that these alone can explain away the large forecast errors. Many forecasts which turned out to be inaccurate were for financial periods ending less than one year after their publication dates. Economic conditions were unlikely to have changed so dramatically over such short time periods. More likely, the forecasts were based on inappropriate assumptions.

1.1.4. Not surprisingly, the longer the time between the date of the prospectus and the end of the financial period being forecast (forecast horizon), the less accurate the forecast tended to be. In addition, the longer the forecast horizon, the more optimistic the forecast tended to be (that is, the more likely the forecast would not be achieved). However, these relationships, while statistically significant, were not as strong as one might have expected. Forecast horizon is but one factor which is likely to be related to forecast accuracy and bias.

1.1.5. Forecasts for manufacturing companies were the most accurate. However, differences in forecast accuracy across industry groups were not statistically significant. Forecasts by investment, financial services, property and manufacturing companies were pessimistic (that is, tended to be exceeded by actual profits), while those for tourism and leisure, retail and distribution and farming, fishing and horticulture companies tended to be optimistic (under-achieved). One possible explanation for the pessimistic forecasts for some

industry groups could be a greater ability to “manage” actual results (for example, through the structuring of transactions or the accounting treatment of transactions and events) to ensure that forecast profits are achieved or exceeded. However, again, differences in forecast bias across industry groups were not significant.

1.1.6. Forecasts published in 1984 were the most accurate while those published in 1983 were the most pessimistic. Although forecasts published in 1985, 1986 and 1987 appeared to be less accurate and more optimistic than forecasts published in 1983 and 1984, these differences in accuracy and bias were not statistically significant.

1.2. Level of Detail of Forecast Information

1.2.1. Just under half the prospectuses which included profit forecasts disclosed information on revenue and net profit before and after tax. About a quarter of the prospectuses went beyond this level of disclosure to include some information on the breakdown of expenses.

1.2.2. Larger companies (in terms of shareholders’ funds immediately on completion of issue of ordinary shares) tended to disclose less detail with their forecasts. However, this finding of a relationship between company size and level of detail was only marginally significant.

1.2.3. There were significant differences in level of detail of forecast information across different industries, with farming, fishing and horticulture companies on average disclosing significantly more detail with their profit forecasts.

1.3. Explanation for Forecast Deviation in Annual Report

1.3.1. About 47% of the relevant annual reports (that is, the annual reports covering financial periods being forecast) did not contain any reference to the original forecasts. About 32% of these annual reports referred to the forecasts but did not explain the deviations, while the remaining 21% referred to and explained forecast deviations.

1.3.2. There was a significant relationship between the provision of explanations for a forecast deviation and whether the forecast was achieved. Where a forecast was not achieved, management tended to either not refer to the forecast at all, or if they did, went on to explain why the forecast was not achieved. However, the greater tendency was to make no reference to the forecast at all. That is, management was generally unwilling to disclose bad news.

1.4. Other Observations

1.4.1. Twenty-one prospectuses which included forecasts were excluded from the study because the forecasts were for twelve-month periods beginning from the date of the

prospectus. These periods did not correspond to formal reporting periods. They were not instances of balance date changes after the publication of the prospectus, but were cases where management would have been fully aware that there would not be reporting periods corresponding to the forecasts.

1.4.2. There was considerable variation in the disclosure of assumptions and accounting policies. Although variation per se is not unexpected because of differences in operating environments faced by different companies, some disclosures were extremely vague.

1.4.3. It was sometimes unclear as to whether the assumptions reflect future events expected to take place and the actions management expects to take (best-estimate assumptions), or future events and management actions which are not necessarily expected to take place (hypothetical assumptions). Further, there is currently no requirement for the auditor to comment on the reasonableness of the assumptions underlying a forecast.

1.4.4. The Regulations do not require disclosure of accounting policies adopted in the preparation of profit forecasts (according to this author's interpretation), and although some disclosure of accounting policies was normally made, in many cases they were insufficient for determining how a forecast profit figure was calculated.

1.4.5. The maximum number of financial years covered by profit forecasts was 10, and a number of prospectuses included profit forecasts for 5 or more financial years. The uncertainty associated with forecasts for such distant periods must be extremely high, and these forecasts are likely to be highly speculative.

2. POLICY RECOMMENDATIONS

Detailed recommendations on possible legislative reform are beyond the scope of this study. However, possible ways of improving the quality of profit forecasts in prospectuses are hereby proposed, the objective being to highlight the important issues which should be considered in legislative reform. In considering reform, the need to guard against misleading forecasts must be balanced against the need to allow the dissemination of potentially useful information to investors. The author believes that the proposals outlined below are not overly-onerous and should not prevent the publication of well-founded profit forecasts.

2.1. Review of Assumptions by the Auditor

2.1.1. Currently, the auditor is only required to comment on whether the accounting policies and calculations are consistent with the stated assumptions. Therefore, the auditor's statutory responsibility in relation to forecasts is very limited. The current requirement that forecasts be reviewed (clause 42(2) of the First Schedule to the Securities Regulations) is unsatisfactory. The review is so restricted that it does little to increase the reliability of forecasts. Requiring such a restricted review may lead to forecasts being

perceived as being more reliable than they really are. ED/AG 19 issued by the NZSA contemplates placing a greater degree of responsibility on the auditor undertaking reviews of profit forecasts.

2.1.2. Clause 42(2) should be amended to require the auditor to comment that the assumptions are not clearly unrealistic, and that to his knowledge, no significant assumptions have been omitted.

2.2. Nature of Assumptions

2.2.1. Professional standards overseas have drawn distinctions between forecasts and projections - forecasts being based on best-estimate assumptions and projections being based on hypothetical assumptions. In the N.Z. prospectuses surveyed, it was sometimes unclear as to whether the assumptions adopted were best-estimate or hypothetical assumptions. The poor accuracy of N.Z. forecasts found in the study may be because many of these were more in the nature of projections.

2.2.2. The Regulations should require the uncertainty associated with forecasts to be emphasised in the prospectus. It may also require that assumptions adopted for preparing forecasts should be best-estimate, rather than hypothetical, assumptions. If projections (which are based on hypothetical assumptions) are to be allowed in prospectuses, they should be heavily qualified.

2.3. Disclosure of Significant Accounting Policies

2.3.1. Another problem which emerged was the difficulty in interpreting some of the profit forecasts because of the lack of information on accounting policies used in their preparation. The Regulations require the auditor to ensure that the accounting policies are consistent with those normally adopted by the company (group), without explicitly requiring their disclosure. Many companies making initial public offerings of securities to the public have no financial statements for periods prior to the issue of the prospectus. In such cases, the current practice adopted by auditors is to comment that the accounting policies are consistent with those to be adopted by the company (group). The author believes that this is unsatisfactory. For these companies, there is currently no assurance that the same accounting policies are actually adopted for both the calculation of the forecast profit and actual profit. There is considerable scope for managers to alter accounting policies to ensure that the actual profit falls close to the forecast profit.

2.3.2. The Regulations should be amended to explicitly require all significant accounting policies to be disclosed in the prospectus. Significant differences in accounting policies applied in determining actual profit and forecast profit, and the monetary effect of these differences, should be disclosed in the annual report.

2.4. Clarifying the Period of the Forecast

2.4.1. Some prospectuses surveyed included profit forecasts for periods which did not correspond to formal reporting periods. The usefulness of such forecasts is questionable because they cannot be directly compared to actual results, making it difficult to evaluate how reliable they have been.

2.4.2. The Regulations should require that profit forecasts and actual results be prepared for comparable periods. This may take the form of a requirement to provide a reconciliation between forecast and actual profit in the appropriate annual report.

2.5. Increasing Accountability for Unachieved Forecasts

2.5.1. At present, directors have little formal accountability for forecasts. This, coupled with the incentive for directors to paint a highly favourable picture of the company to try to ensure a successful issue of securities, may have contributed to the highly optimistic profit forecasts in N.Z.

2.5.2. Directors should be made more accountable for forecasts which are significantly under-achieved, for example, by requiring them to explain such deviations in the annual report or to the Stock Exchange or other agency. One possible desirable effect of such a requirement is that it should increase the care which directors put into the preparation of forecasts.

2.6 Restricting the Number of Years Covered by Forecasts

2.6.1. In N.Z., it was not uncommon for forecasts to span a considerable length of time (up to 10 years). While such forecasts may be useful, they are also likely to be highly speculative. Generally, the same reliance cannot be placed on a 5-year forecast compared to a 1-year forecast. However, it is not desirable to prohibit the publication of forecasts which extend beyond a certain number of years since the activities of some companies are necessarily long-term in nature (e.g. forestry companies). For these companies, forecasts for longer time periods may be justifiable, or even desirable.

2.6.2. Legislation should require companies wishing to include longer-term forecasts (for example, beyond two years) to seek permission from the Securities Commission.

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PART II

DETAILED REPORT

1. INTRODUCTION

Profit forecasts are now a common feature of prospectuses for initial public offerings of equity securities in New Zealand.¹ The majority of these prospectuses issued since the Securities Regulations (hereafter "the Regulations") became law on 1 September 1983 included profit forecasts although they are not mandatory. This is likely to be due to clause 9(1) of the First Schedule to the Regulations and the adoption of the Regulations by the N.Z. Stock Exchange as part of its listing requirements. This clause stipulates that the prospectus should include: "A statement as to the trading prospects of the issuing group, together with any material information that may be relevant thereto."

Given their preponderance, a natural question to ask is "How reliable are these profit forecasts?" There have been concerns that profit forecasts in N.Z. prospectuses have been too optimistic. In their submission to the Law Commission's Review of Company Law, the N.Z. Society of Accountants (NZSA) claimed that "financial forecasts may be 'wildly optimistic to the point of absurdity'."² In addition, an article published in 1987 noted that "a number of recently floated companies have not achieved their forecast profits" but did not examine in detail the extent of the problem.³ A prime objective of this study is to verify these assertions by conducting an in-depth investigation of the accuracy and bias of profit forecasts in N.Z. prospectuses.⁴ However, as will be discussed later, the usefulness of a profit forecast includes, but is not limited to, the accuracy or lack of bias of the forecast. This study also evaluates N.Z. forecasts on another criterion, the level of detail provided in these forecasts. Differences in the distributions of these criteria over time, and potential relationships between these variables and a set of forecast, company and industry factors are examined. Finally, this study also investigates the extent to which management explained differences between forecast and actual profit in annual reports and whether this is related to the extent to which a forecast profit is achieved.

The rest of this report is organised as follows: section 2 evaluates the costs and benefits associated with public disclosure of profit forecasts; section 3 discusses criteria for evaluating the usefulness of forecasts; section 4 reviews relevant previous research; section 5 specifies the research questions and hypotheses underlying the study; section 6 describes the procedures adopted for the empirical examination of N.Z. profit forecasts; section 7 presents the results of the data analyses; section 8 summarises and discusses the

¹ Hereafter, the terms "profit forecast", "earnings forecast" and "forecast" are used interchangeably.

² Myers, V., "Clean Up Prospectuses: Law Commission Told," **National Business Review** (April 6, 1989), p.8.

³ Barstow, J., "Profit Forecasting", **Accountants' Journal** (May 1987), p.29.

⁴ The accuracy of a forecast refers to the absolute difference between actual and forecast profit, regardless of the direction of this difference (sometimes referred to as 'nondirectional bias'). Bias refers to the direction of any difference between actual and forecast profit (sometimes referred to as 'directional bias'). A forecast which is biased may be optimistic or pessimistic. Where actual profit is less than forecast profit, the forecast is optimistic. Conversely, a pessimistic forecast is one where actual profit is greater than forecast profit.

major findings of the study; section 9 considers the limitations of the study; and section 10 sets out recommendations for reform.

2. THE COSTS AND BENEFITS OF PUBLISHED PROFIT FORECASTS

The costs and benefits of allowing the publication of profit forecasts has been vigorously debated. According to Berlinger and Robbins, for a long time, the “external use of prospective information was discouraged for fear that forecasts and projections would fall far short in reliability.”⁵ Indeed, up until 1973, the U.S. Securities and Exchange Commission (SEC) prohibited the use of forecast statements in public filings. Further, as Dev has pointed out, others have argued that “because forecasts are ‘impossible to verify’ on an ex-ante basis, they are not of much use and that ex post comparisons are too late to be of value.”⁶ However, while there have been some concerns about the reliability of forecast information, these concerns have been outweighed by the acceptance that “estimates of the future from those most knowledgeable about the business are as reliable as an historical accounting of what happened in the past.”⁷ In some cases, concerns about reliability have been dealt with by legislation requiring independent checks of forecast information to help ensure their integrity. For example, in N.Z., clause 42(2) of the First Schedule to the Regulations requires any profit forecast included in a prospectus to be reviewed by an auditor. Further, professional accounting bodies in most countries have issued guidelines to accountants involved in compiling or examining forecast information.

The disclosure of forecast information may be particularly important for initial issues of securities to the public. It has been argued that:

*...profit forecasts would be a significant source of information for potential initial public offering (IPO) investors. Unlike companies which are already listed, IPO investors are unable to observe a consensus market price...Hence, accounting numbers are a fundamental part of the valuation process by which IPO investors decide whether the subscription price asked by the issuer is warranted.*⁸

There are significant inter-country differences in legislative and professional requirements governing the publication of forecast information. However, most jurisdictions now adopt a neutral to positive stance on the publication of profit forecasts. That is, forecast information may be disclosed on a voluntary basis. This suggests that legislators perceive that such disclosures do provide some potential net benefit to investors. Ironically, in the U.S., the SEC now encourages such disclosures through its

⁵ Berlinger, R.W. and Robbins, W.B., “Using Forecasts and Projections to Raise Capital,” **Journal of Accounting, Auditing & Finance** (Fall 1986), Vol.1, p.347.

⁶ Dev, S. “Problems in Interpreting Prospectus Profit Forecasts,” **Accounting and Business Research** (Spring 1973), p.110. p.110.

⁷ Berlinger and Robbins, op. cit., p.347.

⁸ Blair, M. and Taylor, S., “Forecasting: The Profit Speaks,” **Chartered Accountant** (August 1989), p.50.

liberal requirements governing prospective information and its adoption of 'safe harbour' rules which protect issuers of forecast information from legal liability "unless the plaintiff can establish that the forecast or projection was prepared without a reasonable basis or was not disclosed in good faith."^{9,10}

The tradeoff between costs and benefits also applies to an individual company's decision to disclose profit forecast information. Costs of disclosure may include the direct monetary costs associated with compiling and publishing such information, availability of sensitive information to competitors and a loss of credibility for management if a forecast is not achieved. The chief benefit from management's point of view is that the provision of such information can help reduce the uncertainties associated with a new issue of securities and therefore increase the probability of a successful issue. The common practice of including profit forecasts in prospectuses, although they are not mandatory, reflects the belief of those raising capital that such information may increase the probability of a successful capital issue and that this outweighs the costs associated with disclosing such information.

3. CRITERIA FOR EVALUATING PROFIT FORECASTS

The prospectus is primarily aimed at providing information to, and protection for, potential investors. A profit forecast conveys management's expectations of profit for a future period and such expectations may represent a particularly important source of information for potential initial public offering investors.¹¹ The inclusion of profit forecasts in prospectuses, notwithstanding their potential lack of reliability, can be defended on the grounds that such information is potentially useful to investors in making investment decisions. How do we assess the usefulness of the information included in a profit forecast?

3.1. Forecast Accuracy and Bias

A frequently cited indicator of usefulness is the accuracy or reliability of the forecast. This is typically defined as the extent to which the reported profit matches the forecast profit. *Ceteris paribus*, more accurate profit forecasts should result in more soundly-based decisions by potential investors.¹² However, given the inherent uncertainty associated with the forecasting process, absolute accuracy while desirable is unlikely to be attainable. Actual profit is unlikely to correspond exactly to forecast profit. Another

⁹ Schaller, C.A. and Whittington, R., "Profit Forecasts in the USA," in **Profit Forecasts: How They Are Made, Reviewed and Used**, C.A. Westwick (Ed.), Gower Publishing, 1983,p.192.

¹⁰ A more extensive summary of the major legislative and professional requirements for U.S., U.K. and Australia is provided in Appendix 1.

¹¹ See Blair and Taylor, op. cit., p.50.

¹² However, a forecast with a larger error made under difficult forecasting conditions may contain more useful information than one with a smaller error made under easy forecasting conditions. That is, forecast errors may not be comparable across companies or over time because of differences in forecasting conditions.

attribute which is closely related to accuracy and which therefore affects the usefulness of a forecast is the extent of bias. Bias indicates whether forecasts tend to be optimistic or pessimistic. That is, if forecast profits do not usually exactly match actual profits, do they tend to be greater than or less than actual profits?¹³ According to Blair and Taylor, in the case of initial public offerings, "equity issuers have an incentive to provide optimistic earnings forecasts in the hope of making the investment opportunity appear more attractive, raising the price they are able to achieve for the equity being offered."¹⁴ However, they also noted disincentives to providing optimistic forecasts. These include negative signals to the market regarding managerial forecasting ability and/or the truthfulness of the forecast where a forecast error is large, and the legal consequences of negligent or fraudulent misrepresentation.

An assessment of the usefulness of a profit forecast needs to go beyond considering its accuracy and bias. Both are ex-post measures since we do not know the extent to which forecasts meet these criteria until the actual results become available. As such, they cannot indicate the usefulness of the forecast information at the time of the original issue of the forecast. It is therefore important to look for other factors which may indicate the usefulness of a forecast.

3.2. Independent Review of Profit Forecast

One factor which can indicate the potential reliability of a profit forecast at the time of its disclosure is whether it has been subjected to an independent review. *Ceteris paribus*, greater assurance can be placed on a forecast which has been independently reviewed. In N.Z., clause 42(2) of the First Schedule to the Regulations requires that any profit forecast included in a prospectus must be reviewed by an auditor, whereupon the auditor's report has to contain a statement in the following form:

In our opinion the forecasts, so far as the accounting policies and calculations are concerned, have been properly compiled on the footing of the assumptions made or adopted by the issuer set out at pp ... of this prospectus and are presented on a basis consistent with the accounting policies normally adopted by the company (group).

Note that the actual ability of auditors to verify forecasts is considerably less than for historical financial information. This limitation in the assurance that auditors can provide on forecast information is emphasised in professional requirements covering the examination of forecasts. However, notwithstanding the inherent difficulties associated with the examination of forecasts, clause 42(2) of the Regulations cited above is unduly narrow because it does not require the auditor to comment on the reasonableness of the

¹³ The concerns expressed in N.Z. about the accuracy of profit forecasts, which were alluded to earlier, are really concerns about the bias in these forecasts. The widely-held belief appears to be that management tends to be too optimistic when forecasting earnings.

¹⁴ Blair and Taylor, *op. cit.*, p.51.

assumptions underlying the forecast. The effectiveness of clause 42(2) is questionable because the scope of the auditor's review required is very limited.

Another problem which currently undermines the usefulness of independent reviews in N.Z. is the absence of significant professional guidelines relating to such reviews. The exposure draft of an auditing guideline on the examination of prospective financial information was only released in June 1989 by the NZSA. The only NZSA guidelines currently applicable are clause 22 of the Code of Ethics and a technical bulletin on the subject, R-205. The former prohibits members from being associated with forecasts which are misleading or which amount to undertakings while the latter, which is not binding, suggests procedures which may be adopted by auditors reviewing forecast information.

3.3. Disclosure of Significant Assumptions and Accounting Policies

According to the exposure draft of an auditing guideline issued by the NZSA: "The adequate disclosure of all significant assumptions is essential to enable the user to understand the basis on which the prospective financial information has been prepared and the uncertainties related thereto."¹⁵ A profit forecast will only be as accurate as its assumptions. Disclosure of assumptions can allow the user of the forecast to assess their reasonableness and consequently, the reasonableness of the forecast. It can also explicitly convey to the user the uncertainties associated with the profit forecast. In N.Z., where a profit forecast is included in a prospectus, the Regulations require the assumptions used in its preparation to be disclosed. Regulation 5(4) states: "Where a profit forecast is included in a registered prospectus, the registered prospectus shall contain a statement of the principal assumptions on which the forecast is based."

As far as accounting policies are concerned, it is generally accepted that to properly interpret a company's reported results, and to be able to compare profits across companies and over time, knowledge of the accounting policies adopted is essential. The same principles apply to interpretations of forecast profit figures. In the context of profit forecasts, the statement of accounting policies is important in two ways: firstly, when interpreting the profit forecast at the time of its disclosure and secondly, in assessing its accuracy or bias by comparing it with the actual result. The profit forecasts of different companies may be affected by the application of different accounting policies and may therefore not be strictly comparable. In addition, where a company has a past trading history, the forecast profit and past actual profits of that company may also not be comparable if different accounting policies are adopted. Further, differences between the forecast profit and the actual profit subsequently achieved may be due primarily to differences in accounting policies used in preparing the two sets of figures.

Although clause 42(2) cited above specifies certain requirements with respect to accounting policies, the Regulations do not explicitly require the disclosure of accounting

¹⁵ N.Z. Society of Accountants, "The Examination of Prospective Financial Information," **ED/AG 19**, June 1989, para 17.

policies adopted in preparing a profit forecast. There may also be problems with interpreting the requirement that the auditor ensure that the accounting policies are consistent with those "normally adopted by the company (group)." Companies making initial public offerings of equity securities frequently do not have previous trading histories. For these companies, it is uncertain as to how the accounting policies can be made consistent with those "normally adopted by the company (group)." In such cases, alternative accounting treatments of transactions and events may be acceptable and the choice of a particular accounting policy can significantly affect the forecast profit. Here, it is particularly important that detailed accounting policies adopted be disclosed. Further, there is no specific requirement that accounting policies applied in the preparation of the profit forecast are similar to those applied in the preparation of the subsequent actual profit figure or that any such differences be disclosed.¹⁶

The importance of significant assumptions and accounting policies is recognised in professional requirements in many countries which require their disclosure with the forecast information.

3.4. Level of Detail of Forecast Information

Another factor which contributes to the usefulness of a profit forecast is the level of detail provided. A profit forecast which consists of a one-line forecast of net profit is less informative than one which includes information on various items contributing to net profit. Detailed disclosures allow users to see how managers expect the forecast profit to be achieved. Potential investors will then be in a better position to assess the reasonableness of the forecast. It has been argued that: "The less detailed the forecast..., the less likely it is to present new information. Thus, in order to provide economic benefits, forecasts probably must be presented in some detail."¹⁷

Legislation and professional requirements in N.Z. and overseas have been largely silent on the items contributing to a forecast profit which should be disclosed. An exception is the auditing guideline issued by the AICPA in the U.S. which states:

...prospective financial statements preferably should be in the format of the historical financial statements that would be issued for the period(s) covered unless there is an agreement between the responsible party and potential users specifying another format. Prospective financial statements may take the form of complete basic financial statements or may be limited to [certain]

¹⁶ A survey of the auditor's reports in the sample of prospectuses found that many contained the phrase "to be adopted by the company" as opposed to "normally adopted by the company (group)", particularly for companies with no previous trading histories. This does not invalidate the need to disclose accounting policies applied in calculating a profit forecast. Further, there is no assurance that the accounting policies "to be adopted by the company" were actually adopted in computing the subsequent actual profit.

¹⁷ Stewart, S.S., "Research Report on Corporate Forecasts," **Financial Analysts' Journal** (January-February 1973), p.78.

*minimum items (where such items would be presented for historical financial statements for the period).*¹⁸

Major income statement items included within the above definition of minimal disclosure are: sales or gross revenue, gross profit or cost of sales, unusual or infrequently occurring items, provision for income taxes, discontinued operations or extraordinary items, income from continuing operations, and net income.

In summary, the foregoing discussion suggests four criteria which can be used to assess the usefulness of profit forecast disclosure in prospectuses:

1. Accuracy and bias of profit forecasts
2. Independent review of profit forecasts
3. Disclosure of significant assumptions and accounting policies
4. Level of detail of profit forecast information

In this study, the assessment of usefulness of profit forecasts focusses on criteria 1 and 4. The profit forecasts included in this study could not be discriminated on criterion 2 because the Regulations require all such forecasts to be independently reviewed. For criterion 3, the Regulations require the disclosure of assumptions which meant that all prospectuses containing forecasts included such disclosures. Further, almost without exception, the prospectuses examined in the study included some reference to accounting policies used in the preparation of profit forecasts. This may be due to the insistence of auditors reviewing the forecasts, a broad interpretation of the Regulations by issuers of prospectuses, or their acceptance that such disclosures are important for understanding the profit forecasts. In any case, this meant that profit forecasts could not be discriminated on whether disclosures of assumptions and policies were made. Operational difficulties precluded any attempt to systematically assess the **quality** of such disclosures. However, some general observations on the adequacy of the disclosure of assumptions and accounting policies in the prospectuses examined, and the effectiveness of the independent review of profit forecasts currently required under the Regulations, are presented.

4. PREVIOUS RESEARCH

In this section, previous research which has examined the distribution of forecast errors and the determinants of these errors is reviewed.¹⁹

¹⁸ American Institute of Certified Public Accountants (AICPA), "Financial Forecasts and Projections," **AU Section 2100**, Appendix A, para .67.

¹⁹ There is a large number of studies which have examined these issues. For example, in the area of accuracy of profit forecasts alone, Westwick reviewed thirty-four studies which have been conducted in the U.S. and U.K. See Westwick, C.A., "How Accurate Are Profit Forecasts?," in **Profit Forecasts: How They Are Made, Reviewed and Used**, C.A. Westwick (Ed.), Gower Publishing, 1983, p.148-183.

4.1. Distribution of Forecast Errors

Studies on the accuracy and bias of profit forecasts have been conducted in several countries, including the U.S., U.K. and Australia. Forecasts examined have tended to be drawn from those made around the release of annual or interim results, or with initial issues of securities to the public.²⁰

Two U.S. studies have specifically addressed the accuracy of management earnings forecasts, both using forecasts published in the Wall Street Journal. McDonald studied 201 forecasts published between 1966 and 1970 and found that "35.3% are within 5% of actual earnings and 48.8% are within 10% of actual earnings. On the other hand, 39.8% are more than 15% from actual earnings."²¹ There was an average over-prediction of 10.2% (i.e. forecasts, on average, were optimistic). Imhoff replicated McDonald's study using forecasts published between 1971 and 1974 and found that, for his sample of 131 forecasts, actual earnings tended to be about 1% below forecast earnings. That is, management forecasts appeared to have become less optimistic after 1970.²²

Note that the two U.S. studies discussed above examined earnings forecasts which are generally issued near the announcement of annual or interim results. Of more relevance to the present study are the studies by Dev and Webb and Blair and Taylor which examined earnings forecasts published in U.K. and Australian prospectuses, respectively. Dev and Webb studied 212 earnings forecasts included in U.K. prospectuses issued in 1968 and 1969. They found that on average, reported profit exceeded forecast profit by 12%, that is, profit forecasts were pessimistic.^{23,24} No precise breakdown of the distribution of forecast errors was reported. However, Blair and Taylor inferred that only "approximately 30 per cent of the forecasts were within 7 per cent of actual results."²⁵ This inference can be obtained from Figure 1 in Dev and Webb's paper. Blair and Taylor examined the accuracy of profit forecasts in Australian prospectuses issued by main board companies from July 1976 to June 1986 (49 forecasts) and by second board

²⁰ Some studies have attempted to compare the accuracy of management forecasts against forecasts made by analysts or by using various forecasting models. These studies of **relative accuracy** of management earnings forecasts are not reviewed here.

²¹ McDonald, C.L., "An Empirical Examination of the Reliability of Published Predictions of Future Earnings," **The Accounting Review** (July 1973), Vol.48, p.508.

²² Imhoff, E.A., "The Representativeness of Management Earnings Forecasts," **The Accounting Review** (October 1978), Vol.53, p.836-850.

²³ Dev, S. and Webb, M., "The Accuracy of Company Profit Forecasts," **Journal of Business Finance** (1972), Vol.4, p.26-39.

²⁴ In their recent paper, Blair and Taylor concluded that "Dev and Webb found...that there existed an average over-prediction (i.e. management were optimistic) of 12 per cent" (p.51). This conclusion is inconsistent with Dev and Webb's actual findings as presented in Table 6 of their paper.

²⁵ Blair and Taylor, op. cit., p.51.

companies from March 1984 and June 1986 (14 forecasts).²⁶ Their major findings are reproduced in Tables 1 and 2. Note in particular the following results:

- (1) only 22% of main board forecasts, and 14% of second board forecasts, were within 10% of actual earnings for the forecast period,
- (2) a considerable proportion of the actual results, particularly for second board companies, deviated by more than 50% from forecast profits, and
- (3) second board forecasts, but not main board forecasts, tended to be optimistic.

Overall, previous research indicates that while large forecast errors (greater than 10% difference between actual and forecast earnings) tend to be common occurrences, the evidence on whether forecasts tend to be optimistic is mixed. It is possible that these mixed findings on the bias associated with forecasts can be attributable to the different institutional environments, including both legislative and professional requirements, which govern the publication of forecasts in different countries (see Appendix 1).

TABLE 1
ABSOLUTE FORECAST ERRORS^a

ERROR SIZE	MAIN BOARD FORECASTS	SECOND BOARD FORECASTS
Less than 10%	11 (22%)	2 (14%)
10% and 25%	10 (21%)	0 (0%)
Between 25% and 50%	10 (20%)	1 (7%)
Between 50% and 100%	13 (27%)	4 (29%)
Greater than 100%	5 (10%)	7 (50%)
Total	49 (100%)	14 (100%)

^a Taken from Blair and Taylor (1989), p.53.

TABLE 2
SIGN OF FORECAST ERRORS^a

	POSITIVE ERRORS	NEGATIVE ERRORS	TOTAL
Main Board Companies	24	25	49
Second Board Companies	3	11	14

^a Taken from Blair and Taylor (1989), p.53.

²⁶ Blair and Taylor did not specify the proportion of Australian prospectuses which included profit forecasts. However, the small number of main board forecasts collected over the ten-year period of their study suggests that profit forecasts are uncommon in Australian prospectuses. This is supported by the following comment in Henderson, S. and Peirson, G., **Issues in Financial Accounting** (4th ed.), Longman Cheshire, 1988, p. 252: "It is rare for an Australian prospectus to contain detailed forecasts in quantitative terms."

4.2. Determinants of Forecast Errors

4.2.1. Forecast Horizon

Previous research suggests that forecast horizon is an important determinant of forecast accuracy.²⁷ Forecast horizon is usually defined as "the time yet to elapse before the end of the fiscal year of the period being forecast."²⁸

A priori, one would expect that the shorter the forecast horizon, the more accurate will be the forecast. Forecasting is an inherently uncertain process and the longer the forecast horizon, the greater the possibility that unexpected events will affect the object of the forecast. This was supported by many previous studies which investigated the relationship between forecast horizon and accuracy.²⁹ It has also been argued that "...if it is considered important to avoid failing to meet forecasts, they would be made more conservative as forecast intervals lengthen by increasing the 'contingency discount' ...If this were done, the ratios of reported to forecast profits would also increase as forecast intervals lengthen."³⁰ Dev and Webb therefore suggest that the longer the forecast horizon, the more pessimistic would be a forecast. This assumes that the costs associated with failure to achieve a forecast outweigh the potential benefits from providing an optimistic forecast (e.g. increasing the probability of a successful issue of securities).

4.2.2. Company Size

Company size has also been found by some studies to be related to forecast accuracy. For example, Hagerman and Ruland found that forecasts by large firms tend to be more accurate than forecasts by smaller firms.^{31,32} They suggest the following explanation for expecting a positive relationship between company size and forecast accuracy: "Large firms are often more diversified and are thus better able to weather the effects of changing environmental conditions. In addition, large firms can commit more resources to forecasting and, consequently, can produce more accurate forecasts than

²⁷ See, for example: Basi, B.A., Carey, K.J. and Twark, R.D., "A Comparison of the Accuracy of Corporate and Security Analysts' Forecasts of Earnings," **The Accounting Review** (April 1976), Vol. 51, p.244-254; Hagerman, R.L. and Ruland, W., "The Accuracy of Management Forecasts and Forecasts of Simple Alternative Models," **Journal of Economics and Business** (1979), Vol.31, p.172-179.

²⁸ Brown, P., Foster, G. and Noreen, E., **Security Analyst Multi-Year Earnings Forecasts and the Capital Market**, Studies in Accounting Research No.21; American Accounting Association, Sarasota, Florida, 1985, p.143.

²⁹ For example, see Basi et al, op. cit.; Hagerman and Ruland, op. cit.

³⁰ Dev and Webb, op. cit., p.31-32.

³¹ Hagerman and Ruland, op. cit.

³² However, Jaggi reports findings suggesting that there is no systematic relationship between firm size and forecast accuracy. See Jaggi, B., "Further Evidence on The Accuracy of Management Forecasts Vis-a-Vis Analysts' Forecasts," **The Accounting Review** (January 1980), Vol.55, p.96-101.

smaller firms.”³³ There may also be stronger incentives for management of larger companies to provide more accurate, or at least less optimistic, forecasts. It has been suggested that larger firms generally have “a higher association with a larger flow of external information sources than do smaller firms.”³⁴ External information sources such as analysts’ forecasts have the potential to confirm or dispute the information released by management and therefore serve as monitoring mechanisms. Larger companies may also be subjected to closer public scrutiny. Therefore, these companies may be more inclined to bias their forecasts downwards because the costs associated with failure to achieve a forecast may be high. In contrast, the costs of failing to achieve a forecast may be lower for smaller companies, which may encourage more optimistic forecasts by smaller companies.

4.2.3. Industry Membership

There is evidence that industry membership is related to forecast accuracy. For example, Dev and Webb observed that the forecast errors for two of the industry groups in their study (building, timber, and roads; foods and groceries) were significantly less than for their entire sample of companies.³⁵ However, definitions of this variable have been inconsistent across studies. For example, Jaggi distinguished between manufacturing, chemical, utility, banking and finance, and service industries,³⁶ while Porter classified industries as manufacturing, utility and other.³⁷ Consequently, it is difficult to generalise and to predict the relationship between industry membership and forecast accuracy.

4.2.4. General Economic Conditions

Prior research suggests that where forecasts for different years are pooled together in analysing forecast accuracy, differences in general economic conditions have to be taken into account. Using overall corporate profitability as a measure of economic conditions, McDonald compared the prediction errors for those years when overall corporate profitability declined against those years when overall corporate profitability increased. He found that for each of the forecast years, the average prediction error was negative. However, where economic conditions were poor, the prediction errors were larger.³⁸

³³ Hagerman and Ruland, op. cit., p.175.

³⁴ Cox, C.T., “Earnings Variability, Firm Size, and the Information Content in Management Forecasts of Annual Earnings,” Journal of Accounting and Public Policy (1987), Vol.6, p.141.

³⁵ Dev and Webb, op. cit.

³⁶ Jaggi, op. cit.

³⁷ Porter, G.A., “Determinants of the Accuracy of Management Forecasts of Earnings,” Review of Business and Economic Research (Spring 1982), Vol.17, p.1-13.

³⁸ McDonald, op. cit.

Porter found that the year of forecast was related to forecast accuracy (defined as the absolute prediction error) and concluded that "the results point out the influence of the general economy on the ability to forecast."³⁹ He argued that: "The results do not prove that management will forecast more accurately during expansionary periods. Instead, the implication is that periods of significant fluctuation in economic conditions...will compound the problems of making accurate forecasts."⁴⁰ Therefore, according to Porter, where there are significant positive or negative changes in economic conditions, forecasts will be less accurate. Significant positive changes in economic conditions may lead to actual profits exceeding forecast profits. Conversely, significant negative changes in economic conditions may lead to forecast profits exceeding actual profits.

This factor may be particularly important in the context of the current study. The significant changes in the economic environment (through de-regulation and the removal of various subsidies and incentives) may have affected the accuracy and bias of N.Z. forecasts.

5. RESEARCH QUESTIONS AND HYPOTHESES

There were two phases in this study. The first phase examined the overall distribution of the criteria by which forecasts were evaluated. The second phase involved a study of whether these criteria were related to particular factors.

In addition, the present study also examined the extent to which management explained forecast deviations where actual profit departed from forecast profit. Where actual profit is significantly different from forecast profit, explanations for this difference can provide useful information to investors. Investors can assess the extent to which these factors are likely to affect the future profitability of the company. Such explanations also help fulfil the accountability function of directors. As far as the author can ascertain, only the London Stock Exchange requires such explanations where there is a significant difference between actual profit and a published forecast profit. This explanation should be set out in the directors' report in the appropriate annual report. If this is not done, the company is required to issue a statement at its annual general meeting and to the Stock Exchange. A variation of "10 per cent or more above or below the forecast level is regarded as significant."⁴¹

The following subsections set out the research questions underlying phase one and the hypotheses tested under phase two of the study.

5.1. Research Questions

- (1) How accurate are N.Z. profit forecasts?
- (2) Are these profit forecasts biased in a particular direction?

³⁹ Porter, *op. cit.*, p.13.

⁴⁰ *Ibid.*

⁴¹ Knight, J.R., "The Role of the Stock Exchange," in **Profit Forecasts: How They Are Made, Reviewed and Used**, C.A. Westwick (Ed.), Gower Publishing, 1983, p.117.

- (3) How much detail is provided with N.Z. profit forecasts?
- (4) Does management tend to explain forecast deviations in annual reports?

5.2. Hypotheses

For the second phase, several hypotheses (specified in null form) were tested to see if the criteria examined in the first phase varied systematically with particular factors. Not all possible relationships were examined. Of particular interest was whether forecast accuracy and bias differed across industries and whether more recent forecasts had indeed been less accurate and more optimistic than earlier forecasts.

Hypothesis 1: Forecast accuracy is unrelated to forecast horizon.

Hypothesis 2: Forecast bias is unrelated to forecast horizon.

Hypothesis 3: Forecast accuracy is unrelated to company size.

Hypothesis 4: Forecast bias is unrelated to company size.

Hypothesis 5: Forecast accuracy is unrelated to industry membership.

Hypothesis 6: Forecast bias is unrelated to industry membership.

Hypothesis 7: Forecast accuracy is unrelated to the year of publication of a forecast.

Hypothesis 8: Forecast bias is unrelated to the year of publication of a forecast.

Hypothesis 9: Level of detail of profit forecast information is unrelated to company size.

Hypothesis 10: Level of detail of profit forecast information is unrelated to industry membership.

Hypothesis 11: Level of detail of profit forecast information is unrelated to the year of publication of the forecast.

Hypothesis 12: Explanation for forecast deviation is unrelated to the extent to which a forecast is achieved.

6. RESEARCH METHOD

6.1. Data Collection

All N.Z. prospectuses for initial public offerings of equity securities dated from 1 September 1983 through, and issued by companies which subsequently listed on the N.Z. Stock Exchange, were to be included in the study. The starting date was chosen to coincide with the date the Securities Regulations 1983 came into effect.⁴² 31 December 1988 was chosen as the cut-off date for the inclusion of prospectuses in the study.⁴³

The following procedures for collecting prospectuses were followed. First, the N.Z. Stock Exchange (NZSE) annual reports for the years 1983 to 1988 were consulted. The information on initial listings for ordinary shares was used to construct a list of prospectuses issued over the period of the study. Prospectuses were then acquired from various sources, including the Securities Commission, sharebrokers, directly from companies, and from an ex-colleague who had previously undertaken a study using prospectus information. The search uncovered most of the prospectuses identified in the NZSE annual reports. However, there were some apparent discrepancies in these annual reports. Through communication with sharebrokers and with companies, some companies listed as having issued prospectuses did not appear to have done so. Further, some additional prospectuses not identified in the NZSE listings were uncovered. For the period 1983-1988, a total of 123 prospectuses were identified and collected. 113 of these (92%) included earnings forecasts for at least one financial period (forecasts were often for periods other than one year).

Initially, all earnings forecasts for financial periods ending before 30 June 1989 were included in the study.⁴⁴ This yielded a total of 218 earnings forecasts. Forecasts for which there were no matching actual profit figures available were then excluded from analysis, resulting in a final sample of 141 forecasts (82 companies). The major reasons for missing actual profit figures include: actual profit for a particular period not yet published, mergers and takeovers, company failures, and mismatches between the period covered by a forecast and the period covered in the reported results.⁴⁵ Actual profit

⁴² One of the requirements introduced by these Regulations is that all profit forecasts included in a prospectus must be reviewed by an auditor. Prior to this, requirements relating to prospectuses were governed by the Companies Act 1955 and there was no requirement for such a review.

⁴³ However, no prospectus for initial public offerings of equity securities to the public was issued between October 1987 (after the sharemarket crash) and the end of 1988.

⁴⁴ There is generally a lag of several months between the end of the financial year and the publication of the annual report. Including forecasts for periods up to 30 June 1989 ensured that actual results were likely to be available at the time of the study.

⁴⁵ A mismatch can be due to two reasons. Firstly, there may be a change in balance date after the issuance of the prospectus. Secondly, 21 prospectuses included earnings forecasts for twelve-month periods commencing from the date of the prospectus. Such periods are essentially arbitrary as they do not correspond to any formal reporting period. There were therefore no actual profit figures corresponding to these forecasts. In both cases, comparisons between forecast and actual profits are meaningless.

figures for the periods corresponding to the forecasts were obtained through a comprehensive search of annual reports, Friday issues of the National Business Review and company summaries published by DATEX. Given the extensiveness of the search, it is expected that few actual profit figures were not found, if they had actually been published at the time of data collection. Where possible, the annual reports were used to obtain information on actual profit.

Appendix 2 presents an alphabetical listing of the prospectuses included in the study, together with the industry classification of the company and the prospectus date. Table 3 summarises the information on industry classification and year of publication of prospectuses and forecasts.⁴⁶

TABLE 3
DISTRIBUTION OF SAMPLE PROSPECTUSES
AND FORECASTS BY INDUSTRY AND YEAR OF PUBLICATION^a

INDUSTRY	1983	1984	1985	1986	1987	TOTAL
Manufacturing	2(2)	6(9)	2(4)	2(3)	1(1)	13(19)
Farming, fishing and horticulture	2(7)	4(6)	3(7)	4(9)	3(3)	16(32)
Investment	0(0)	4(8)	1(2)	1(2)	5(8)	11(20)
Property	3(3)	0(0)	2(2)	4(7)	2(2)	11(14)
Tourism and leisure	0(0)	2(3)	3(7)	2(4)	3(5)	10(19)
Retail and distribution	0(0)	3(4)	1(2)	2(4)	2(3)	8(13)
Financial services	2(7)	1(1)	0(0)	0(0)	2(4)	5(12)
Others ^b	0(0)	4(7)	2(3)	1(1)	1(1)	8(12)
TOTAL	9(19)	24(38)	14(27)	16(30)	19(27)	82(141)

^a Numbers in brackets refer to the number of sample forecasts for particular cells.

^b These were made up the following companies: two food (3 forecasts), two mining (4), two bloodstock (3), one waste management (1), and one debt collection (1).

⁴⁶ One company, Growthlink Holdings, included forecasts for two financial periods in its prospectus. However, one of these was for a financial period ending **before** the date of the prospectus. This forecast was excluded from the study.

6.2. Variable Measurement

The measure of profit used in this study to calculate forecast accuracy and bias was net profit after tax (NPAT) because this figure was presented in all the forecasts. In most cases, NPAT excluded extraordinary items such as writeoff of preliminary expenses and revaluations. Steps were taken to ensure, as far as possible, that the definitions of forecast and actual profit were consistent.⁴⁷

6.2.1. Forecast Accuracy and Bias

Two measures of forecast accuracy (1 and 2 below) and two measures of forecast bias (3 and 4) were used in this study. These are relative measures, with forecast deviations being expressed relative to absolute forecast or actual profit. The use of multiple measures was motivated by comments by overseas researchers about the possible sensitivity of results to definitions of relative forecast errors. It allows us to examine whether the results of the present study are sensitive to the manner in which we calculate forecast error measures.

Forecast accuracy: Absolute relative error measures

$$(1) \quad ARE1 = \frac{| \text{Actual profit} - \text{forecast profit} |}{| \text{Forecast profit} |}$$

$$(2) \quad ARE2 = \frac{| \text{Actual profit} - \text{forecast profit} |}{| \text{Actual profit} |}$$

Forecast bias: Signed relative error measures

$$(3) \quad SRE1 = \frac{\text{Actual profit} - \text{forecast profit}}{| \text{Forecast profit} |}$$

$$(4) \quad SRE2 = \frac{\text{Actual profit} - \text{forecast profit}}{| \text{Actual profit} |}$$

⁴⁷ In some cases, the information provided with the profit forecast was insufficient for identifying how 'net profit after tax' was arrived at. In such cases, it was assumed that extraordinary items such as preliminary expenses and revaluations have been excluded. In all cases, actual profit figures excluded extraordinary items.

The forecast accuracy measures can take on values greater than or equal to zero, with a larger value representing a less accurate forecast. These measures indicate the extent to which actual profit differs from forecast profit. For example, a value of 0.50 means that actual profit deviated from forecast profit by 50%.⁴⁸ The forecast bias measures may be zero, positive or negative, with a positive value indicating a pessimistic forecast and a negative value indicating an optimistic forecast. For example, a value of -0.50 means that actual profit fell below forecast profit by 50%.⁴⁹

The use of relative measures allows us to compare forecast errors across firms of different sizes with different expected profit levels. All analyses involving forecast accuracy and bias use these measures. However, to give an indication of the magnitude of a particular forecast error (which may be useful for judging the overall materiality of a forecast error), the total difference between each actual and forecast profit (in dollars) was also computed. This information is presented in Appendix 3, which contains descriptive information relating to each forecast included in the study, sorted by size of one of the the forecast bias measures (SRE1) employed in the study.

6.2.2. Level of Detail of Forecast Information

The level of detail of profit forecast information was classified into four categories:

- (1) Net profit after tax only
- (2) Net profit before and after tax
- (3) Revenue, net profit before and after tax⁵⁰
- (4) Revenue, net profit before and after tax, and a breakdown of operating expenses.

These four categories were derived inductively as follows: the profit forecast information disclosed in each prospectus was scrutinised and clear variations in the level of detail disclosed were identifiable. The four categories above appeared to adequately capture major differences in level of detail of forecast information disclosed by the sample companies.

6.2.3 Explanation for Forecast Deviation

The variable "explanation for forecast deviation" was classified into three categories:

- (1) No reference in annual report as to whether forecast profit was achieved, and no explanation for deviation between actual and forecast profit

⁴⁸ The deviation may be expressed relative to forecast profit or actual profit.

⁴⁹ Again, this deviation may be expressed relative to forecast profit or actual profit.

⁵⁰ Some investment and property companies disclosed information on gross income or some other similar item. Disclosure of these items was treated as equivalent to the disclosure of revenue.

(2) Reference in annual report as to whether forecast profit was achieved but no explanation for deviation between actual and forecast profit.⁵¹

(3) Reference in annual report as to whether forecast profit was achieved, and explanation provided for deviation between actual and forecast profit.

Of primary interest was the proportion of companies which provided explanations compared to those which did not (category 3 versus categories 1 and 2 together). However, to more clearly show patterns of disclosure relating to this variable, the above three categories were used. Similar to the measurement of level of detail of forecast information discussed above, these three categories were derived inductively.

6.2.4 Forecast Horizon

This was measured by the number of days between the date of the prospectus and the end of the financial period being forecast.

6.2.5 Company Size

Company size was measured by total shareholders's funds immediately after the issue of the shares being offered under the prospectus (assuming all the shares were subscribed for).

6.2.6 Industry Membership

Companies were classified into 7 major industry groups as follows: (1) manufacturing, (2) farming, fishing and horticulture, (3) investment⁵² (4) property, (5) tourism and leisure, (6) retail and distribution and (7) financial services. Eight companies were not included in these industry groups and were excluded from analyses involving this variable.

6.2.7 Year of Forecast

Forecasts in this study were classified according to the year of publication of the prospectus when analysing changes in forecast accuracy and bias, and level of detail of forecast information, over time.

⁵¹ For a reference to a forecast deviation to be deemed to have been made, there must either be an explicit statement that the forecast was exceeded or underachieved, or a statement as to what the forecast profit was.

⁵² The classification of companies as investment companies was particularly difficult because some financial services companies also appeared to engage in the provision of equity finance to a significant degree. These were excluded from this industry group and classified separately as financial services companies. In addition, two of the companies classified as investment companies were involved in investing in currency contracts and gold, rather than in shares in other companies. As a precaution, analyses involving the variable 'industry membership' were rerun without these two latter companies. There were no significant changes in the results.

7. DATA ANALYSIS AND RESULTS

Table 4 presents descriptive statistics on the continuous independent and dependent variables included in the study.^{53,54}

TABLE 4
DESCRIPTIVE STATISTICS ON CONTINUOUS INDEPENDENT AND
DEPENDENT VARIABLES INCLUDED IN STUDY

VARIABLE	NO.	MIN.	MAX.	MEAN	STD.DEV.	MEDIAN
ARE1 ^a	141	0.00	105.40	2.72	9.53	0.68
ARE2 ^b	141	0.00	22.75	1.71	3.46	0.66
SRE1 ^c	141	-105.40	23.39	-.86	9.88	-0.01
SRE2 ^d	141	-19.23	22.75	-.78	3.78	-0.01
Horizon [days]	141	5	1660	440	279	395
Company size [\$m]	82	0.32	728.25	21.70	81.36	6.51

^a ARE1 = forecast accuracy measure with absolute forecast profit as denominator.

^b ARE2 = forecast accuracy measure with absolute actual profit as denominator.

^c SRE1 = forecast bias measure with absolute forecast profit as denominator.

^d SRE2 = forecast bias measure with absolute actual profit as denominator.

The first phase of the analysis examined in detail the distributions of the four dependent variables employed in this study (research questions 1 to 4).⁵⁵ The results are presented under Section 7.1. The second phase investigated associations between these dependent variables and various factors (hypotheses 1 to 12).⁵⁶ The results of this phase are presented under Section 7.2.

Certain conventions are adopted for the presentation and discussion of results. Firstly, although results using two measures of forecast accuracy and two measures of forecast bias are presented, for brevity reasons, the discussion of these results focusses on one accuracy measure (ARE1) and one bias measure (SRE1). However, the effects of using the alternative measures of forecast errors are discussed, where they are significant. Secondly, unless otherwise stated, the median is used for describing the average or typical

⁵³ The distributions of the dependent variables are analysed in detail under Section 7.1.

⁵⁴ These summary statistics are only meaningful for variables which have continuous distributions.

⁵⁵ These four dependent variables are: forecast accuracy, forecast bias, level of detail of forecast information and explanation for forecast deviation in annual report.

⁵⁶ All statistical analyses were carried out using the SPSSX3 statistical analysis package.

values of variables.⁵⁷ Its use reflects the distributional properties of many of the key variables in this study.^{58,59}

7.1. Overall Distributions of Dependent Variables

7.1.1. Forecast Accuracy and Bias

Table 5 shows the distribution of forecast accuracy for the present study. The 'bands' used in Table 5 are chosen to facilitate a comparison with the recent study by Blair and Taylor on the accuracy and bias of forecasts published in Australian prospectuses.^{60,61}

TABLE 5
DISTRIBUTION OF MEASURES OF FORECAST ACCURACY (N = 141)

ERROR SIZE	ARE1 ^a		ARE2 ^b	
	NO.	PERCENTAGE	NO.	PERCENTAGE
Less than 10%	19	13.5%	20	14.2%
Between 10% and 25%	19	13.5	20	14.2
Between 25% and 50%	24	17.0	15	10.6
Between 50% and 100%	22	15.6	36	25.5
Greater than 100%	57	40.4	50	35.5
Median	0.68		0.66	

^a ARE1 = accuracy measure with absolute forecast profit as denominator.

^b ARE2 = accuracy measure with absolute actual profit as denominator.

⁵⁷ The mean, median and mode are three measures used by statisticians to indicate average or typical behaviour.

⁵⁸ The median is calculated by ranking a variable from smallest to largest and finding the middle value (that is, the value which splits the sample into two equal subsets).

⁵⁹ The median is a more appropriate measure of central tendency if a variable is measured on an ordinal scale or if its distribution is skewed, that is, where there are more cases toward one end of the distribution than the other. In the latter case, the mean will be unduly influenced by extreme values. If a distribution is negatively skewed, that is, where there are more cases toward lower values, the mean will be less than the median and vice versa.

⁶⁰ Blair and Taylor, *op. cit.*

⁶¹ Blair and Taylor's results are presented and discussed in Section 4.1.

In assessing differences in results between Blair and Taylor's study and the present study, it should be noted that they distinguished between main board and second board forecasts. Since only three second board companies (5 forecasts) were included in the present study, separate analyses of main board and second board forecasts will not be meaningful. The two types of forecasts were therefore combined for all subsequent analyses. However, the small number of second board forecasts means that they will not significantly affect the results.

In N.Z., a smaller percentage (about 14%) of actual results fell within $\pm 10\%$ of the forecast profit, compared to 22% for main board forecasts and 20.6% for all forecasts in Australia. However, the most notable difference is the larger proportion of N.Z. forecasts where actual profit deviated by $\pm 100\%$ or more from forecast profit. Actual profit deviated from forecast profit by an average of just under $\pm 70\%$ for the N.Z. forecasts, which is large in comparison with the forecast errors found in the overseas studies surveyed.⁶²

In their paper, Blair and Taylor did not specify whether one forecast was drawn from each prospectus or whether multiple forecasts from each prospectus were used in cases where they were available. If only the first forecast from each prospectus was used in their study, a comparison of forecast accuracy between the entire sample of forecasts in the present study with their sample may be biased in favour of their study. This is because forecasts which involve longer forecasting horizons will tend to be less accurate and the inclusion of multiple forecasts will mean a proportionately greater number of forecasts involving long forecast horizons. The distribution of forecast accuracy was therefore re-examined using only the first forecast from each prospectus. Given the above argument about the negative relationship between forecast horizon and accuracy (and the association between these two variables found in this study and presented in a later section), it is not surprising that the percentage of very large errors (greater than 100%) has now declined. However, the percentage of forecasts in the $\pm 10\%$ band remained virtually unchanged. The average deviation is now about 60%. Notwithstanding the changes in distribution of forecast accuracy, the above comments about the relative accuracy of Australian and N.Z. forecasts still hold.

Appendix 4 presents the distribution of forecast accuracy where only the first forecast from each prospectus is included. Note from Table 5 and Appendix 4 that the use of different measures of forecast accuracy results in some changes in the distribution of forecast accuracy but does not invalidate the above conclusions.

In addition to forecast accuracy, of interest in the present study is the possible presence of bias in profit forecasts. That is, did the N.Z. forecasts tend to be optimistic or pessimistic? Blair and Taylor found that 51% of main board forecasts were not achieved (negative forecast errors), while 79% of second board forecasts were not achieved (combined percentage of 57%). For this study, of the 141 forecasts included, 70 (49.6%) were not achieved. If only first forecasts are included, 37 of the 82 forecasts (45%) were not achieved. Therefore, in terms of percentage of forecasts achieved, N.Z. forecasts

⁶² Blair and Taylor did not specify the median or mean forecast error for their sample of forecasts. However, given the information presented in Table 1 and 2 of their paper, it can be inferred that these will be considerably lower than the median or mean forecast error for the present study.

compare favourably with Australian forecasts. However, as Table 6 and Appendix 5 show, the distributions of the forecast bias measures are skewed. Of those forecasts with **large** forecast errors, a higher proportion involved actual profit falling below forecast profit, rather than above forecast profit.⁶³ This explains why the median forecast bias was about zero, although the mean forecast bias indicates forecasts which were highly optimistic (see Table 4).

TABLE 6
DISTRIBUTION OF MEASURES OF FORECAST BIAS (N=141)

ERROR SIZE	SRE1 ^a		SRE2 ^b	
	NO.	PERCENTAGE	NO.	PERCENTAGE
Greater than -100%	30	21.3%	43	30.5%
Between -50% and -100%	17	12.1	14	9.9
Between -25% and -50%	13	9.2	6	4.3
Between -10% and -25%	7	5.0	4	2.8
Between +10% and -10%	19	13.5	20	14.2
Between 10% and 25%	12	8.5	16	11.3
Between 25% and 50%	11	7.8	9	6.4
Between 50% and 100%	5	3.5	22	15.6
Greater than 100%	27	19.1	7	5.0
Median	-0.01		-0.01	

^a SRE1 = bias measure with absolute forecast profit as denominator.

^b SRE2 = bias measure with absolute actual profit as denominator.

7.1.2. Level of Detail of Forecast Information

In looking at the distribution of, and relationships involving the variable "level of detail of forecast information", it is appropriate to adopt the prospectus rather than the forecast as the unit of analysis because all forecasts included within a particular prospectus contained the same level of detail. Table 7 presents the overall distribution of level of detail of forecast information.

Just under half the prospectuses provided information on revenue, and net profit before and after tax. About a quarter of the prospectuses went beyond this level of

⁶³ This skewness is less pronounced where only first forecasts are included and SRE1 is used as the forecast bias measure. See Appendix 5.

disclosure to include some information on the breakdown of expenses. However, less than 15% of the prospectuses included only a one-line forecast of net profit after tax.

TABLE 7
DISTRIBUTION OF LEVEL OF DETAIL OF
FORECAST INFORMATION (N=82)

LEVEL OF DETAIL	NO.	PERCENTAGE
Net profit after tax only	11	13.4%
Net profit before & after tax	10	12.2
Net profit before & after tax; revenue	38	46.3
Net profit before & after tax; revenue, breakdown of expenses	23	28.0

7.1.3. Explanation for Forecast Deviation

Table 8 presents the distribution of the variable "explanation for forecast deviation". The definition of this variable means that information on this was not available in cases where actual results were obtained from sources other than annual reports. Data for this variable was available for 133 of the 141 forecasts.

Only about one-fifth of all annual reports referred to forecast deviations and provided explanations for these deviations. Just under half of the annual reports reporting on results forecast in the prospectuses did not even mention any forecast deviation (by either failing to refer to the profit which was forecast or if the actual profit was above or below the forecast profit).

Since it can be argued that explanations for forecast deviations are most useful if deviations are actually significant, the distributions were also computed by including only cases where deviations were greater than $\pm 10\%$ (following the London Stock Exchange rules). The recomputed results are also presented in Table 8. Changes to the distributions are insignificant, with the percentage in category 2 dropping marginally and the percentages in the other two categories increasing slightly.⁶⁴ If we accept that explanations for forecast deviations are useful (and perhaps expected from directors),

⁶⁴ If only the first forecast from each prospectus is included, the proportion of annual reports making no reference to the original forecast is about one-third. The proportion of forecasts increases to 39.5% in category 2, and 26.3% in category 3. That is, references to and explanations for forecast deviations were more likely to be made for results relating to the first forecast. If only those first forecasts which were associated with significant deviations are included, the percentages in each categories are almost identical to the percentages where all first forecasts are included.

disclosure practice in this area leaves something to be desired. There appears to be a lack of accountability associated with forecasts.

TABLE 8
DISTRIBUTION OF EXPLANATION FOR FORECAST DEVIATION

EXPLANATION FOR DEVIATION	ALL FORECASTS (N=133)		ARE1≥10% (N=115)	
	NO.	PERCENTAGE	NO.	PERCENTAGE
No reference, no explanation (1)	62	46.6%	55	47.8%
Reference, no explanation (2)	43	32.3	34	29.6
Reference & explanation (3)	28	21.1	26	22.6

7.2. Tests of Relationships

For the analysis of relationships discussed in this section, nonparametric statistics are appropriate because of the non-normal distributions and/or ordinal nature of many of the variables. Three types of nonparametric statistics were used:

(a) Spearman rank correlation: this was used where both sets of variables have continuous distributions;

(b) Kruskal-Wallis 1-way analysis of variance (hereafter K-W): this was used to assess whether there were significant differences between various groups (e.g. industries).

(c) Median test: like the K-W test, this was used for assessing differences between groups. However, here the response variable is only measured on an ordinal scale.⁶⁵ Traditional significance levels were used to determine significance of relationships.⁶⁶

For most of the analyses in this phase of the study, only one forecast (the first) from each prospectus was used.^{67,68} To improve readability, only major results of tests are presented in this report.

⁶⁵ A measure is ordinal if the values which the measure take on can be meaningfully ordered. However, differences between values are not necessarily equal. For example, the variable "level of detail of forecast information" is ordinal because we can say that the four levels represent increasing amount of detail disclosed. However, we cannot say that the differences in amount of detail disclosed between each level are equal.

⁶⁶ Significance levels of $p < .05$ and $p < .01$ were used. Significance tests indicate the likelihood particular relationships which have been found may be attributable to a random occurrence. That is, if a relationship is statistically significant, we can be more confident that the relationship is not spurious.

⁶⁷ This was a precaution taken to reduce the potential for misleading inferences due to the existence of relationships between forecast horizon and forecast accuracy and bias (which was the case in this study as this section shows). For example, if all forecasts are included, an analysis of the relationship between industry membership and forecast accuracy will tend to show lower accuracy for those industries which provided more forecasts. We may then conclude that certain industries have less accurate forecasts, without recognising that the forecasts for these industries have longer average forecast horizons (because more forecasts per prospectus is included). There is evidence that the number of forecasts included in a prospectus is related to industry membership. For the analyses involving forecast horizon and accuracy and bias, results for all forecasts and only first forecasts are presented to demonstrate the existence of the abovementioned relationships.

7.2.1. Forecast Accuracy and Bias

Forecast Horizon and Company Size

To test whether forecast accuracy and bias were associated with forecast horizon and company size (hypotheses 1 to 4), Spearman rank order correlations were used. The results are presented in Table 9.

The correlations presented in Table 9 can be interpreted in the following manner. The significant positive correlations between forecast horizon and the forecast accuracy measures mean that, on average, the longer the forecast horizon, the less accurate was the forecast. Therefore, null hypothesis 1 was rejected. The significant negative correlations between forecast horizon and the forecast bias measures imply that, on average, the longer the forecast horizon, the more optimistic was the forecast. That is, forecasts for financial periods which were more distant from the prospectus date were more likely to be under-achieved. Null hypothesis 2 was rejected.

TABLE 9

SPEARMAN CORRELATIONS BETWEEN FORECAST HORIZON, COMPANY SIZE AND FORECAST ERROR MEASURES

	ARE1 ^a	ARE2 ^b	SRE1 ^c	SRE2 ^d
Horizon (all forecasts)	.2604**	.1914**	-.1659*	-.1711*
Horizon (first forecasts)	.3028**	.2799**	-.2198*	-.2469**
Company size (first forecasts)	-.0770	-.1800	.0645	.0548

^a ARE1 = accuracy measure with absolute forecast profit as denominator.

^b ARE2 = accuracy measure with absolute actual profit as denominator.

^c SRE1 = bias measure with absolute forecast profit as denominator.

^d SRE2 = bias measure with absolute actual profit as denominator.

* Significant at p < .05.

** Significant at p < .01.

⁶⁸ For the reason discussed in Section 7.1.2, the analyses of relationships involving the level of detail of forecast information use the prospectus as the unit of analysis (which is the same as using the first forecast only).

From table 9, we can see that there was no relationship between company size and either forecast accuracy or bias. All four correlations relating to company size were not significant at conventional significance levels. Therefore, null hypotheses 3 and 4 were not rejected.

Industry Membership

Next, the relationships between industry membership and forecast errors were examined. Table 10 shows the following for the 7 industry groups: average accuracy, average bias and percentage of forecasts which were not achieved.⁶⁹

TABLE 10
FORECAST ERRORS FOR SEVEN INDUSTRY GROUPS (N=74)^a

INDUSTRY	N	MEDIAN ARE1 ^b	MEDIAN ARE2	MEDIAN SRE1 ^c	MEDIAN SRE2	%SRE <0 ^d
Manufacturing	13	.24	.19	.04	.04	46.2
Farming, fishing and horticulture	16	.66	.59	-.19	-.20	56.3
Investment	11	.60	.38	.12	.11	27.3
Property	11	.69	.43	.11	.10	36.4
Tourism and leisure	10	.95	2.89	-.80	-1.15	60.0
Retail and distribution	8	.46	.57	-.24	-.42	62.5
Financial services	5	1.06	.51	1.06	.51	0.0

^a Forecasts for the 8 companies in the "others" industry classification were excluded from all analyses which involve comparisons across industries. This group of companies is felt to be less homogeneous than the above industry groups and the small number of each type of company precluded classifying them into additional industry groups.

^b ARE1 and ARE2 are measures of forecast accuracy, with larger values indicating less accurate forecasts.

^c SRE1 and SRE2 are measures of forecast bias, with negative values indicating optimistic forecasts and positive values indicating pessimistic forecasts.

^d This column indicates the percentage of forecasts which were not achieved.

The use of the two measures of forecast accuracy showed that the relationship between industry membership and forecast accuracy was unstable. However, for both measures, forecasts by manufacturing companies were the most accurate. In contrast, the relationship between industry membership and bias was stable.

⁶⁹ Recall the earlier argument for using the median for measuring averages.

Forecasts for financial services, investment, property and manufacturing companies tended to be pessimistic while those for tourism and leisure, retail and distribution and farming, fishing and horticulture companies were, on average, optimistic. However, K-W tests used to formally test these relationships found the relationships between industry membership and forecast accuracy and bias to be insignificant. Null hypotheses 5 and 6 were therefore not rejected.

Year of Publication of Forecast

Of interest in the present study was whether forecasts have become less accurate, or more particularly, more optimistic in recent years. Several business commentators have suggested this to be the case. To examine this, forecasts were classified according to the year of publication of forecasts (that is, the year of publication of the prospectus), which for this study comprised the years 1983 - 1987.⁷⁰ Average measures of accuracy and bias, and percentage of forecasts not achieved for each year are shown in Table 11.

TABLE 11
FORECAST ERRORS BY YEAR OF PUBLICATION OF FORECAST (N=82)

YEAR OF PUBLICATION	N	MEDIAN ARE1 ^a	MEDIAN ARE2	MEDIAN SRE1 ^b	MEDIAN SRE2	%SRE <0 ^c
1983	9	.57	.55	.38	.28	33.3
1984	24	.27	.26	.12	.11	33.3
1985	14	.77	.71	-.30	-.43	57.1
1986	16	.94	.61	.04	.04	37.5
1987	19	.81	1.21	-.45	-.82	63.2

^a ARE1 and ARE2 are measures of forecast accuracy, with larger values indicating less accurate forecasts.

^b SRE1 and SRE2 are measures of forecast bias, with negative values indicating optimistic forecasts and positive values indicating pessimistic forecasts.

^c This column indicates the percentage of forecasts which were not achieved.

There appears to be some evidence of differences in forecast accuracy over time. It appears that the forecasts published in 1985, 1986 and 1987 had indeed been less accurate than the forecasts published in the other two years. The average accuracy for the most recent three years was below the overall average accuracy for the sample, while the average accuracy for the other two years was above the overall average accuracy (see Appendix 4). The most obvious difference is the greater accuracy for the forecasts published in 1984 compared to the other four years. However, K-W tests found the

⁷⁰ Recall that there was no prospectus for an initial public offering of equity securities issued in 1988.

differences in forecast accuracy over different years of publication to be insignificant. Null hypothesis 7 was not rejected.

Table 11 also shows that earlier forecasts tended to be more pessimistic. Forecasts published in 1983 and 1984 were on average exceeded by actual profit and only one-third of these forecasts were not achieved. In contrast, forecasts published in 1985 and 1987 were on average highly optimistic. More than 50% of the forecasts published in the last three years were not achieved. However, K-W tests showed differences in bias across different years of publication were not significant. Null hypothesis 8 was therefore not rejected.

7.2.2. Level of Detail of Forecast Information

Company Size

Table 12 presents descriptive statistics on size of companies disclosing various levels of detail of forecast information in their prospectuses. As stated earlier, when looking at the overall distribution of this variable, most companies disclosed **at least** net profit before and after tax, and revenue.

TABLE 12
LEVEL OF DETAIL OF PROFIT FORECAST
INFORMATION AND COMPANY SIZE (N=82)^a

LEVEL OF DETAIL	NO.	MIN.	MAX.	MEAN	S.D.	MEDIAN
Net profit after tax (1)	11	4.4	728.3	106.8	222.2	17.9
Net profit before and after tax (2)	10	2.5	17.1	7.9	4.3	6.3
Net profit before and after tax; revenue (3)	38	.3	43.0	9.8	9.3	6.6
Net profit before and after tax; revenue; breakdown of expenses (4)	23	2.4	78.4	12.0	17.5	6.0

^a Company size expressed in millions of dollars.

It can be seen that there is little difference in size for companies disclosing at least net profit before and after tax information. However, companies which disclosed only net profit after tax were considerably larger than other companies. In other words, larger companies tended to disclose the least amount of detail with their profit forecasts, but companies which disclosed beyond this minimum did not differ significantly in size. A K-W test showed differences in company size across the four levels of detail were only marginally significant ($p < .10$). Null hypothesis 9 was not rejected.

Industry Membership

Next, an examination of possible differences in level of detail of forecast information across the 7 major industry groups was carried out. The percentage of companies disclosing information at various levels, and the average level of detail for each industry, are presented in Table 13.

TABLE 13
LEVEL OF DETAIL OF PROFIT FORECAST
INFORMATION ACROSS SEVEN INDUSTRY GROUPS^{a,b}

INDUSTRY	NO.	LEVEL OF DETAIL				MEDIAN
		1	2	3	4	
Manufacturing	13	7.7%	7.7%	76.9%	7.7%	3.0
Farming, fishing and horticulture	16	6.3	6.3	25.0	62.5	4.0
Investment	11	27.3	0.0	36.4	36.4	3.0
Property	11	18.2	18.2	45.5	18.2	3.0
Tourism and leisure	10	0.0	10.0	70.0	20.0	3.0
Retail and distribution	8	0.0	12.5	50.0	37.5	3.0
Financial services	5	40.0	60.0	0.0	0.0	2.0

^a Eight companies in the "others" industry group were not separately analysed.

^b The data included here is based on one observation per prospectus - that is, the unit of analysis is the prospectus.

Certain interesting observations are apparent. Firstly, just under two-thirds of the companies in the farming, horticulture and fishing industry group included information on net profit before and after tax, revenue and a breakdown of expenses. However, very few companies in the financial services, property and manufacturing industries disclosed this level of detail. Overall, companies in the farming, fishing and horticulture industry group presented the most detail with their profit forecasts. A median test showed significant differences in level of detail across industry groups ($p < .01$).⁷¹ Null hypothesis 10 was rejected.

⁷¹ However, the small expected frequencies for a large percentage of the cells (greater than 20%) mean that the estimated significance of the differences could be overstated. Combining the industry groups displaying similar distributions for this variable supported the significance of this relationship.

Year of Publication of Prospectus

If we analyse the level of detail disclosed in prospectuses over time, we can see from Table 14 below that the average level of detail of forecast information was lower in 1983 compared to the other four years. None of the nine prospectuses published in 1983 included information which included disclosure of the breakdown of expenses (level 4). However, there was little evidence of consistently increasing disclosure after 1983. A median test of differences in level of detail across different years of publication of the prospectuses found no significant differences. Therefore, null hypothesis 11 was not rejected.

TABLE 14
YEAR OF PROSPECTUS AND LEVEL OF DETAIL OF PROFIT FORECAST INFORMATION (N=82)^a

YEAR OF PUBLICATION	NO.	LEVEL OF DETAIL				MEDIAN
		1	2	3	4	
1983	9	33.3%	33.3%	33.3%	0.0%	2.0
1984	24	16.7	20.8	37.5	25.0	3.0
1985	14	7.1	7.1	42.9	42.9	3.0
1986	16	12.5	0.0	56.3	31.3	3.0
1987	19	5.3	5.3	57.9	31.6	3.0

^a The data included here is based on one observation per prospectus - that is, the unit of analysis is the prospectus.

7.2.3. Explanation for Forecast Deviation in Annual Report

Achievement of Forecast

Finally, of interest was whether the provision of explanations for forecast deviations was related to the extent to which forecasts were achieved. There is substantial previous evidence that management is more reluctant to disclose bad news. If a forecast is not achieved, managers may not wish to highlight this by disclosing this fact in the relevant annual report. On the other hand, if a forecast is exceeded or met, managers may be more inclined to discuss the forecast deviation because it reflects positively on their ability (at least their forecasting ability, and possibly their managerial ability). The usefulness of providing explanations for forecast deviations is not diminished where a forecast is under-achieved compared to where it is over-achieved. Table 15 presents the average bias for all forecasts, classified according to the three levels of disclosure for this variable.

Forecasts in categories 1 (no reference, no explanation) and 3 (reference, plus explanation) were underachieved while those in category 2 (reference, no explanation) were overachieved. These differences were more pronounced for one of the forecast bias

measures (SRE2). Similar results were found where only forecasts with significant deviations (greater than $\pm 10\%$) were included. The latter are also presented in Table 15. K-W tests found that differences in forecast bias across the three categories were highly significant. Multiple comparisons confirm that the significant results are due to differences in forecast bias between categories 2 and 1, and categories 2 and 3. That is, companies which referred to forecast deviations but which did not explain these deviations tended to have pessimistic forecasts (forecast profit was exceeded), while those companies which either did not refer to forecast deviations at all or which referred to and explained deviations tended to have optimistic forecasts (forecast profit was not achieved). Management of companies which failed to achieve forecasts either chose not to highlight this fact at all, or if they did, they went on to explain why forecast profit was not achieved. Recall, however, the previous finding that about half of all annual reports did not refer to a forecast made for a period to which the annual report related. Therefore, for companies which did not achieve the forecast profit, a larger number chose not to refer to the forecast deviation, compared to the number which actually referred to and explained the forecast deviation. The results support the rejection of null hypothesis 12.

TABLE 15
EXPLANATION FOR FORECAST DEVIATION AND
ACHIEVEMENT OF FORECAST PROFIT

EXPLANATION FOR DEVIATION	ALL FORECASTS (N=133)				ARE1 \geq 10% (N=115)			
	N	MEDIAN SRE1 ^a	MEDIAN SRE2 ^b	%SRE <0	N	MEDIAN SRE1	MEDIAN SRE2	%SRE <0
No reference (1)	62	-.47	-.80	64.5%	55	-.54	-.95	70.9%
Reference, no explanation (2)	43	.28	.22	18.6	34	.52	.36	14.7
Reference, with explanation (3)	28	-.37	-.58	64.3	26	-.40	-.83	69.2

^a SRE1 = bias measure with absolute forecast profit as denominator.

^b SRE2 = bias measure with absolute actual profit as denominator.

8. SUMMARY AND DISCUSSION OF MAJOR FINDINGS

This study examined the disclosure of profit forecasts in N.Z. prospectuses for initial public offerings of equity securities issued by companies which subsequently listed on the N.Z. Stock Exchange. Using a comprehensive sample of 82 prospectuses (141 forecasts) published from 1 September 1983 through to late 1987, the accuracy and bias of profit forecasts, level of detail of profit forecast information, and the extent to which management explained deviations between forecast and actual profit in annual reports, were examined. First, the overall distributions of these variables were examined. Then,

various hypothesised relationships involving these variables were investigated. The major findings are summarised and discussed under sections 8.1 to 8.3.

8.1. Forecast Accuracy and Bias

A small proportion (about 14%) of N.Z. forecasts had forecast deviations (i.e. differences between forecast profit and actual profit) of less than $\pm 10\%$, while a large proportion (more than 35%) of N.Z. forecasts had forecast deviations of greater than $\pm 100\%$. The average deviation was just under $\pm 70\%$. Therefore, on average, N.Z. forecasts were not very accurate. A comparison with the findings from a recent Australian study shows that N.Z. forecasts were less accurate than Australian forecasts.

The percentage of forecasts not achieved was just under 50% (that is, about as expected if there is an equal probability of a forecast being exceeded or not achieved). However, a relatively large proportion of actual results fell **below** forecast profits by a large percentage (greater than 100%).

Although the significant changes in the economic environment in N.Z. in recent years may have contributed to the large proportion of highly inaccurate and optimistic forecasts, it is doubtful that these alone can explain away the large forecast errors. Many forecasts which turned out to be inaccurate or optimistic were for financial periods ending less than one year after their publication dates. Economic conditions were unlikely to have changed so dramatically over such short time periods. More likely, the forecasts were based on inappropriate assumptions.

Not surprisingly, the longer the time between the date of the prospectus and the end of the financial period being forecast (forecast horizon), the less accurate the forecast tended to be. In addition, the longer the forecast horizon, the more optimistic the forecast tended to be (that is, the more likely the forecast would not be achieved). However, these relationships, while statistically significant, were not as strong as one might have expected. Forecast horizon is but one factor which is likely to be related to forecast accuracy and bias.

Forecasts for manufacturing companies were the most accurate. However, differences in forecast accuracy across industry groups were not statistically significant. Forecasts by investment, financial services, property and manufacturing companies were pessimistic (that is, tended to be exceeded by actual profits), while those for tourism and leisure, retail and distribution and farming, fishing and horticulture companies tended to be optimistic (under-achieved). One possible explanation for the pessimistic forecasts for some industry groups could be a greater ability to "manage" actual results (for example, through the structuring of transactions or the accounting treatment of transactions and events) to ensure that forecast profits are achieved or exceeded. However, again, differences in forecast bias across industry groups were not significant.

When forecasts were classified according to year of publication (1983 - 1987), it was found that forecasts published in 1984 were the most accurate while those published in 1983 were the most pessimistic. Although forecasts published in 1985, 1986 and 1987 appeared to be less accurate and more optimistic than forecasts published in 1983 and 1984, these differences in accuracy and bias were not statistically significant.

8.2. Level of Detail of Forecast Information

Just under half the prospectuses which included profit forecasts disclosed information on revenue and net profit before and after tax. About a quarter of the prospectuses went beyond this level of disclosure to include some information on the breakdown of expenses. Larger companies (in terms of shareholders' funds immediately on completion of issue of ordinary shares) tended to disclose less detail with their forecasts. However, this finding of a relationship between company size and level of detail was only marginally significant.

There were significant differences in level of detail of forecast information across different industries, with farming, fishing and horticulture companies on average disclosing significantly more detail with their profit forecasts.

8.3. Explanation for Forecast Deviation in Annual Report

About 47% of the relevant annual reports (that is, the annual reports covering financial periods being forecast) did not contain any reference to the original forecasts. About 32% of these annual reports referred to the forecasts but did not explain the deviations, while the remaining 21% referred to and explained forecast deviations.

There was a significant relationship between the provision of explanations for forecast deviations and whether the forecast was achieved. Where forecasts were not achieved, management tended to either not refer to the forecast at all, or if they did, went on to explain why the forecast was not achieved. However, the greater tendency was to make no reference to the forecast at all. That is, management was generally unwilling to disclose bad news.

8.4. Other Observations

In addition to the above findings which are supported by the data analyses carried out and reported in section 7, the study uncovered some practices which were likely to have reduced the potential usefulness of these forecasts.

Twenty-one prospectuses which included forecasts were excluded from the study because the forecasts were for twelve-month periods beginning from the date of the prospectus. These periods did not correspond to formal reporting periods. They were not instances of balance date changes after the publication of the prospectus, but were cases where management would have been fully aware that there would not be reporting periods corresponding to the forecasts.

There was considerable variation in the disclosure of assumptions and accounting policies. Although variation per se is not unexpected because of differences in operating environments faced by different companies, some disclosures were extremely vague. It was sometimes unclear as to whether the assumptions reflect future events expected to take place and the actions management expects to take (best-estimate assumptions), or future events and management actions which are not necessarily expected to take place (hypothetical assumptions). Professional standards overseas (and ED/AG 19 issued by the NZSA) have drawn distinctions between forecasts and projections - forecasts being

based on best-estimate assumptions and projections being based on hypothetical assumptions. Further, there is currently no requirement for the auditor to comment on the reasonableness of the assumptions underlying a forecast. The Regulations also do not explicitly require the disclosure of accounting policies adopted in the preparation of profit forecasts, and although some disclosure of accounting policies was normally made, in some cases they were insufficient for determining how a forecast profit figure was calculated.

The maximum number of financial years covered by profit forecasts was 10, and a number of prospectuses included profit forecasts for 5 or more financial years. The uncertainty associated with forecasts for such distant periods must be extremely high, and these forecasts are likely to be highly speculative. According to ED/AG19, "underlying assumptions become more speculative as the length of the period covered increases. As the period lengthens, the ability of management to make best-estimate assumptions decreases. The period [covered by the forecast] should not extend beyond the time for which management has a reasonable basis for the assumptions" (para 16).

9. LIMITATIONS OF THE STUDY

The major limitation in this study is the difficulty in measuring the usefulness of profit forecasts. That is, what constitutes a useful profit forecast? At the conceptual level, we can define a useful profit forecast as one which provides information which assists potential investors in making investment decisions. However, attempting to determine whether a particular forecast is useful or how useful it is is more problematic. In this study, several criteria were used to evaluate profit forecasts. These were proposed as appropriate indicators of the usefulness of a profit forecast. Given the difficulty in measuring usefulness, it does not follow that forecasts which meet these criteria to a lesser degree are necessarily less useful. Further, while it may be reasonable to argue, for example, that *ceteris paribus* a more accurate forecast is more useful than a less accurate forecast,⁷² there is no evidence that an inaccurate forecast disadvantages particular investors. An "inaccurate" forecast may represent the best available information at the time the forecast is made, and this may be preferable to no forecast at all. In relation to accuracy, we do not know what forecast error is tolerable and therefore when a forecast becomes "useless".

The study also suffers from specific measurement problems. Firstly, since the calculation of forecast accuracy and bias requires information on actual profit, forecasts were excluded where the companies which issued the forecasts have failed, merged, been taken over, or which have changed balance dates. This would have resulted in the

⁷² Even such a statement may be invalid. For example, a forecast with a 10% error for a company operating in a stable environment may be less useful than one with a 20% error for a company operating in a highly uncertain environment.

misstatement of the true errors associated with forecasts. Further, the relatively larger number of company failures in recent years meant that the true forecast errors for these years would have been understated to a greater extent than for earlier years.

Secondly, the computation of forecast error measures assumes that the same accounting policies are applied in calculating both forecast and actual profit. This assumption may have been invalid in some cases.

Thirdly, the comparison of forecast error measures across companies may be confounded by certain companies having a greater ability to "manage" their actual results to ensure that forecast profits are achieved or exceeded. If this was true, different forecast errors may not have reflected different forecasting ability.

Fourthly, there are many methods of measuring forecast accuracy and bias and the results of a particular study may be sensitive to the measures used. There is little theoretical guidance in the literature on the choice of measures of accuracy and bias. To partially deal with this problem, two measures of forecast accuracy and two measures of forecast bias were employed in the present study. Although there was some instability in results for different measures, in general, the findings of the study are robust for the measures used.

Fifthly, the measurement of the other dependent and independent variables was imprecise. For the variable "level of detail of forecast information", only four categories were used although in reality, this is a continuous variable (that is, to take on a wider range of values). The use of three categories for the variable "explanation for forecast deviation" suffers from the same weakness. In addition, the classification of companies into industries was a difficult and somewhat subjective exercise. A different researcher might have classified some companies differently. Others may disagree with how some of the companies were grouped to form one industry - however, sample size problems meant some crudeness in the measurement of this variable were inevitable.

Finally, in examining the provision of explanations for forecast deviations, only the annual reports were surveyed. It is possible that such explanations were provided at the annual general meeting or through the news media. It was not feasible to search other possible sources for such disclosures. However, it can be defended on the grounds that the annual report represents the most formal means of communication between directors and shareholders.

10. POLICY RECOMMENDATIONS

Notwithstanding the limitations of the study discussed above, the survey of profit forecast disclosure practices in N.Z. prospectuses highlights several problems with the quality of these disclosures. One possible response is to prohibit the publication of such forecasts. This was the U.S. SEC position until the early 70s, which has since been reversed. Provided that forecasts are made under realistic assumptions, the information provided in these forecasts is potentially more useful than historical information for making investment decisions. While the problem with unrealistic forecasts is a significant one, the position taken by overseas regulatory agencies suggests that the perceived potential benefits from allowing the publication of forecasts outweigh the costs of unreliable forecasts.

A better option is to continue to allow companies to publish profit forecasts but to take additional measures to reduce the potential for misleading forecasts. These measures may take the form of sanctions for the inclusion of misleading forecasts or a tightening of the disclosure requirements relating to forecasts. This author prefers an emphasis on the latter because proving that a forecast is willfully misleading could be exceedingly difficult. The diversity of legislative and professional requirements relating to the publication of profit forecasts in the various countries surveyed illustrates the difficulty in formulating policy in this area. Detailed recommendations on possible legislative reform is beyond the scope of this study. However, possible ways of improving the quality of profit forecasts in prospectuses are hereby proposed, the objective being to highlight the important issues which should be considered in legislative reform. In considering reform, the need to guard against misleading forecasts must be balanced against the need to allow the dissemination of potentially useful information to investors. The author believes that the proposals outlined below are not overly-onerous and should not prevent the publication of well-founded profit forecasts.

10.1. Review of Assumptions by the Auditor

Currently, the auditor is only required to comment on whether the accounting policies and calculations are consistent with the stated assumptions. Therefore, the auditor's statutory responsibility in relation to forecasts is very limited. The current requirement that forecasts be reviewed (clause 42(2) of the First Schedule to the Securities Regulations) is unsatisfactory. The review is so restricted that it does little to increase the reliability of forecasts. Requiring such a restricted review may lead to forecasts being perceived as being more reliable than they really are. ED/AG 19 issued by the NZSA contemplates placing a greater degree of responsibility on the auditor undertaking review of profit forecasts.

Clause 42(2) should be amended to require the auditor to comment that the assumptions are not clearly unrealistic, and that to his knowledge, no significant assumptions have been omitted.

10.2. Nature of Assumptions

Professional standards overseas have drawn distinctions between forecasts and projections - forecasts being based on best-estimate assumptions and projections being based on hypothetical assumptions. In the N.Z. prospectuses surveyed, it was sometimes unclear as to whether the assumptions adopted were best-estimate or hypothetical assumptions. The poor accuracy of N.Z. forecasts found in the study may be because many of these were more in the nature of projections.

The Regulations should require the uncertainty associated with forecasts to be emphasised in the prospectus. It may also explicitly specify that the assumptions adopted for preparing forecasts should reflect circumstances which management believes are most likely to exist over the forecast period, rather than circumstances which may exist. If projections (which are based on hypothetical assumptions) are to be allowed in prospectuses, they should be heavily qualified.

10.3. Disclosure of Significant Accounting Policies

Another problem which emerged was the difficulty in interpreting some of the profit forecasts because of the lack of information on accounting policies used in their preparation. The Regulations require the auditor to ensure that the accounting policies are consistent with those normally adopted by the company (group), without explicitly requiring their disclosure. Many companies making initial public offerings of securities to the public have no financial statements for periods prior to the issue of the prospectus. In such cases, the current practice adopted by auditors is to comment that the accounting policies are consistent with those to be adopted by the company (group). The author believes that this is unsatisfactory. For these companies, there is currently no assurance that the same accounting policies are actually adopted for both the calculation of the forecast profit and actual profit. There is considerable scope for managers to alter accounting policies to ensure that the actual profit falls close to the forecast profit.

The Regulations should be amended to explicitly require all significant accounting policies to be disclosed in the prospectus. Significant differences in accounting policies applied in determining actual profit and forecast profit, and the monetary effect of these differences, should be disclosed in the annual report.

10.4. Clarifying the Period of the Forecast

Some prospectuses surveyed included profit forecasts for periods which did not correspond to formal reporting periods. The usefulness of such forecasts is questionable because they cannot be directly compared to actual results, making it difficult to evaluate how reliable they have been.

The Regulations should require that profit forecasts and actual results be prepared for comparable periods. This may take the form of a requirement to provide a reconciliation between forecast and actual profit in the appropriate annual report.

10.5. Increasing Accountability for Unachieved Forecasts

At present, directors have little formal accountability for forecasts. This, coupled with the incentive for directors to paint a highly favourable picture of the company to try to ensure a successful issue of securities, may have contributed to the highly optimistic forecasts in N.Z. In U.K., the London Stock Exchange formally monitors forecasts published by listed companies and have rules requiring explanations from directors where actual results are significantly different from forecast profits.

Directors should be made more accountable for forecasts which are significantly under-achieved, for example, by requiring them to explain such deviations in the annual report or to the Stock Exchange or other agency. One possible desirable effect of such a requirement is that it should increase the care which directors put into the preparation of forecasts.

10.6. Restricting the Number of Years Covered by Forecasts

In N.Z., it was not uncommon for forecasts to span a considerable length of time (up to 10 years). While such forecasts may be useful, they are also likely to be highly speculative. Generally, the same reliance cannot be placed on a 5-year forecast compared to a 1-year forecast. However, it is not desirable to prohibit the publication of forecasts which extend beyond a certain number of years since the activities of some companies are necessarily long-term in nature (e.g. forestry companies). For these companies, forecasts for longer time periods may be justifiable, or even desirable.

Legislation should require companies wishing to include longer-term forecasts (for example, beyond two years) to seek permission from the Securities Commission.

APPENDIX 1

SUMMARY OF OVERSEAS LEGISLATIVE REQUIREMENTS AND PROFESSIONAL GUIDELINES GOVERNING PROFIT FORECASTS

This summary discusses major requirements and guidelines applicable to profit forecasts in the U.S., U.K. and Australia, and draws extensively from R. Elmslie, "Independent Reports on Profit Forecasts," The Chartered Accountant in Australia (1988), Vol.58 No.11, p.61-63.^a

1. AUSTRALIA

A. Legislation:

There is no requirement for companies to issue profit forecasts or for an independent expert's report for any forecasts issued.

The Companies (Acquisition of Shares) Act, which applies to takeover situations, prohibits directors of companies from issuing profit forecasts unless the National Companies and Securities Commission (NCSC) has given consent in writing. The NCSC is guided by Policy Statement 103 in its examination of any application to publish profit forecasts. This statement does not require an independent report to accompany profit forecasts. However, if an expert is commissioned to report on the forecasts, that report should be qualified if the reporting accountants:

- a. have reason for a material reservation about accounting policies or calculations;
- b. have reasons to consider the accounting policies and calculations to be inconsistent with the stated assumptions;
- c. have not obtained all the information necessary.

The above restrictions do not apply to profit forecasts in prospectuses.

B. Professional Guidelines:

This is in the nature of ethical guidelines. Both the Institute of Chartered Accountants in Australia and the Australian Society of Accountants have an ethical ruling which requires that any member who is commissioned to report on the reasonableness of a company's profit projections should not appear to confirm, underwrite or guarantee the achievability of forecasts in the report.

2. UNITED KINGDOM

A. Legislation:

There is no requirement for profit forecasts to be published. The City Code, which governs takeovers and mergers, requires the accounting bases and calculations of any profit forecasts included in takeover documents to be examined and reported on by auditors or consulting accountants.

Practice Note 4 of the Memoranda of Interpretation and Practice, a supplement to the City Code, states that the reporting accountants should "satisfy themselves that the profit forecasts, so far as the accounting policies and calculations are concerned, have been properly compiled on the footing of the assumptions made." The reporting accountant is not required to comment on the reasonableness of the assumptions on which a forecast is based. However, if an assumption which is to be published appears to be unrealistic

or if an assumption which appears to be important is omitted, the reporting accountant must comment on this in his report. According to Elmslie, in practice the above guideline is also adopted by accountants when reviewing a profit forecast for inclusion in a prospectus.

B. Professional Guidelines:

Statement S23 issued by the U.K. Chartered Accountants (UKCA) makes several references to, and expresses support for, the requirements of the City Code and the Stock Exchange. It also sets out a reporting accountant's responsibilities in reviewing profit forecasts. These include:

- (a) matters to be agreed to between the directors and the reporting accountants,
- (b) avoiding giving the impression that the accountant is confirming, underwriting, guaranteeing or otherwise accepting responsibility for the accuracy and realisation of forecasts, and
- (c) matters which the reporting accountant should direct attention to in the examination.

C. Stock Exchange Requirements:

Requirements relating to the publication of profit forecasts by companies listed on the London Stock Exchange are set out in Schedule II Part A and B to the Stock Exchange "Admission of Securities to Listing." Companies are required to include a statement of financial and trading prospects in their prospectuses. Where this statement includes a profit forecast, the following major requirements apply: disclosure of principal assumptions upon which a profit forecast is based, independent reporting by auditors or reporting accountants on the bases and calculations, and a report by the issuing house as to whether or not it has satisfied itself that the directors have made "due and careful enquiry"^b before presenting the forecast.

Where there is a significant deviation between a forecast profit and actual profit ($\geq 10\%$), an explanation for the deviation is to be included in the annual report (directors' report). If this was not done, the company would be asked to issue a statement at the AGM which would be announced to the Stock Exchange and disseminated to the market and public.

3. UNITED STATES

A. Legislation:

The Securities and Exchange Commission (SEC) pronouncements, Regulation S-K9.03 and 9.04, govern the publication of forecasts. These requirements are general, the major ones being:

- (a) the need for forecasts to have a reasonable basis and to be prepared in good faith,
- (b) that items included in the forecasts should not be susceptible to misleading inferences through selective projection of only favourable items.

There is no requirement that assumptions be disclosed, although such disclosure is recommended. There is also a 'safe harbour' rule to minimise the concern for legal liability arising from prospective information. This rule provides that "the issuer is not liable unless the plaintiff can establish that the forecast or projection was prepared without a reasonable basis or was not disclosed in good faith."^c

B. Professional Guidelines:

Statement AU S2100 issued by the American Institute of Certified Public Accountants (AICPA) sets out the standards and provides guidance to accountants involved in examining, compiling, or applying agreed upon procedures to, prospective financial

statements. Different requirements apply depending on whether an examination, compilation or application of agreed upon procedures is involved. For example, for an examination, major requirements include evaluating and reporting on the reasonableness of the underlying assumptions, and whether presentation of the forecasts conform with AICPA presentation guidelines. For a compilation, major requirements include evaluating whether the forecast (including significant assumptions and accounting policies) appear to be obviously not inappropriate and whether the presentation conforms with AICPA presentation guidelines.

^a The legislative requirements and professional guidelines applicable in New Zealand are discussed in the body of the paper. Briefly, these include: (a) Reg. 5(4) of the Regulations which requires the disclosure of significant assumptions underlying profit forecasts included in registered prospectuses, (b) clause 42(2) of the First Schedule to the Regulations which require these profit forecasts to be reviewed, and (c) clause 22 of the Code of Ethics of the N.Z. Society of Accountants which prohibits members from being associated with forecasts which amount to undertakings.

^b Knight, J.R. , "The Role of the Stock Exchange," in **Profit Forecasts: How They Are Made, Reviewed and Used**, C.A. Westwick (Ed.), Gower Publishing, 1983, p.115.

^c Schaller and Whittington, op. cit., p.191-192.

APPENDIX 2

DESCRIPTIVE INFORMATION FOR SAMPLE PROSPECTUSES INCLUDED IN STUDY (N = 82)

COMPANY NAME	INDUSTRY ^a	PROSPECTUS DATE
AGLAND HOLDINGS	Farm	210487
AGRICOLA RESOURCES	Farm	030686
AIC FINANCE	Fin	180484
AITKENHEAD GROUP	Manu	201185
ANGORA CORPORATION	Farm	310585
APPLE FIELDS	Farm	080986
ARAHU PROPERTIES	Prop	201185
ARTHUR BARNETT PROP.	Prop	090986
ASCENT CORPORATION	Manu	071186
AUSTRALASIAN BREEDING	Blod	300985
AUSTRALIS INTERNAT'L	Inv	101086
BANCORP HOLDINGS	Fin	110387
BANK OF NEW ZEALAND	Fin	120287
BATLEY PRINTING GROUP	Manu	231184
BAYCORP HOLDINGS	Debt	040686
CARBORUNDUM N.Z.	Manu	040484
CARDRONA SKI AREA	Leis	260385
CAVALIER CORPORATION	Manu	171183
CEREBOS GREGGS	Food	310784
CHARTER CORPORATION	Inv	200284
CITY REALTIES	Prop	291086
COMMODORE COMPUTER	Dist	220485
COMPASS DUTY FREE	Ret	080587
DALGETY CROWN CORP.	Farm	031183
DAMBA FURNITURE WORK	Manu	281186
DE REDCLIFFE GROUP	Tour	280987
EASTERN DEER CORP.	Farm	010285
ENERGYCORP INVESTMENT	Manu	300187
ENVIRON CORPORATION	Wast	300387
ENZED TECHNOLOGY USA	Dist	091086
EQUITICORP HOLDINGS	Inv	160484
FIRST CITY FINANCE	Fin	121083
FLEUR INTERNATIONAL	Hort	290284
FORTUNA CORPORATION	Dist	230384
GAZE HOLDINGS	Prop	300487
GENERAL PROPERTIES	Prop	020983
GOLDCORP HOLDINGS	Inv	270187
GOLIATH MINING	Mine	260984
GREENHOUSE PARK	Hort	140685
GROCORP PACIFIC	Hort	021084
GROWTHLINK HOLDINGS	Inv	100287
HELICOPTER LINE	Leis	090486
HORNER GREENLEES	Inv	160287
HORTICULTURAL IND.	Hort	170284
INVESTMENT FINANCE	Fin	300983
KAUREX CORPORATION	Mine	260785

LASERCORP HOLDINGS	Dist	011286
LAURENSONS BAKERY	Food	210384
LEISURELAND CORP.	Leis	240284
LES MILLS FITNESS	Leis	120785
MAINSTAY PROPERTIES	Prop	081183
MAINZEAL PROPERTIES	Prop	281086
MASPORT LIMITED	Manu	130784
MICHAEL HILL INTERN'L	Ret	080687
MORTON EQUITIES	Inv	270287
MOYES AND GROVES	Manu	150983
N.Z. SKIFIELDS	Leis	110387
N.Z. MARINE FARMS	Fish	081184
N.Z. SALMON COMPANY	Fish	120983
NORTHLAND FM RADIO	Leis	051084
NORTHROP INSTRUMENTS	Manu	311084
PERRY DINES CORP.	Manu	200284
POWERCORP GROUP	Dist	100984
PRODUCORP INDUSTRIES	Farm	190687
QUEENSTOWN RESORTS	Tour	260485
RAINBOW CORPORATION	Inv	290384
RANK GROUP LIMITED	Inv	270187
REGAL SALMON LIMITED	Fish	090986
RENOUF CORPORATION	Inv	300884
RENOUF PROPERTY DEV.	Prop	300885
SKEGGS CORPORATION	Fish	060587
STARS CORPORATION	Leis	260587
STEVENS KMS CORP.	Manu	141185
STRADA HOLDINGS	Leis	120786
TECHNIGROUP HOLDINGS	Inv	150885
THE TERRACE PROJECT	Prop	140286
UNITED TRANSPORT	Dist	080684
VIKO HOLDINGS	Manu	170484
WAIKATO STUD LIMITED	Blod	080684
WILLIAMS PROPERTY	Prop	201083
WOODCORP HOLDINGS	Prop	250587
WOODSTOCK INVESTMENT	Farm	120986

^a Legend for industry classifications:

Blod	=	bloodstock
Debt	=	debt collection
Dist	=	distribution
Farm	=	farming
Fin	=	financial services
Fish	=	fishing
Food	=	food
Hort	=	horticulture
Inv	=	investment
Leis	=	leisure
Manu	=	manufacturing
Mine	=	mining
Prop	=	property
Ret	=	retail
Tour	=	tourism
Wast	=	waste management

APPENDIX 3

DESCRIPTIVE INFORMATION FOR FORECASTS INCLUDED IN STUDY^a

COMPANY NAME	FORECAST NUMBER	FORECAST HORIZON ^b	FINANCIAL YEAREND	RELATIVE ERROR 1 ^c	RELATIVE ERROR 2 ^d	TOTAL ERROR (IN DOLLARS)	LEVEL OF DETAIL ^e	EXPLANATION FOR DEVIATION ^{f,g}
ENZED TECHNOLOGY USA	1	264	300687	-105.40	-1.01	-1581000	4	1
KAUREX CORPORATION	2	766	300987	-24.87	-.96	-4078000	3	NA
AGRICOLA RESOURCES	1	392	300687	-20.12	-.95	-7137258	3	1
THE TERRACE PROJECT	2	685	311287	-10.14	-1.11	-1176000	4	3
GOLDCORP HOLDINGS	2	428	310388	-7.36	-1.16	-34000000	4	NA
AGLAND HOLDINGS	1	435	300688	-5.82	-1.21	-4647000	4	3
FLEUR INTERNATIONAL	1	396	310385	-4.24	-1.31	-1162762	4	1
COMPASS DUTY FREE	1	330	310388	-3.82	-1.35	-5932000	4	3
ANGORA CORPORATION	2	760	300687	-3.56	-1.39	-4309903	4	1
KAUREX CORPORATION	1	401	300986	-3.52	-.78	-151148	3	1
N.Z. SALMON COMPANY	5	1660	310388	-3.51	-1.40	-5433000	3	1
N.Z. MARINE FARMS	2	783	311286	-3.46	-1.41	-2419000	4	1
WOODSTOCK INVESTMENT	2	687	310788	-3.31	-1.43	-2686856	4	1
ASCENT CORPORATION	1	144	310387	-3.26	-1.44	-1797000	3	1
N.Z. SALMON COMPANY	4	1295	310387	-3.00	-1.50	-2704000	3	1
WAIKATO STUD LIMITED	2	661	310386	-2.60	-1.63	-706702	2	1
GOLIATH MINING	1	186	310385	-2.47	-1.68	-947775	3	3
NORTHLAND FM RADIO	2	542	310386	-2.44	-1.69	-342675	3	3
LEISURELAND CORP.	1	400	310385	-2.43	-1.70	-1445962	2	3
PRODUCORP INDUSTRIES	1	195	311287	-2.31	-1.77	-1665210	4	1
GOLIATH MINING	2	551	310386	-2.23	-1.81	-2350948	3	1
N.Z. SKIFIELDS	2	660	311288	-2.03	-1.97	-2107000	3	1
POWERCORP GROUP	2	658	300686	-2.03	-1.97	-2030000	2	1
EASTERN DEER CORP.	2	849	310587	-1.89	-2.12	-1825206	4	1
EASTERN DEER CORP.	1	484	310586	-1.34	-3.92	-691290	4	1
WOODCORP HOLDINGS	1	401	300688	-1.26	-4.79	-8259000	3	1
N.Z. SALMON COMPANY	1	200	310384	-1.20	-.55	-240698	3	1
ENZED TECHNOLOGY USA	2	629	300688	-1.17	-7.02	-1256000	4	2

STRADA HOLDINGS	1	718	300687	-1.14	-8.23	-1525349	3	1
AUSTRALIS INTERNAT'L	2	628	300688	-1.10	-10.84	-3817065	3	1
AUSTRALIS INTERNAT'L	1	263	300687	-.95	-19.23	-1430600	3	3
STARS CORPORATION	2	370	310588	-.95	-17.21	-3460000	3	1
AUSTRALASIAN BREEDIN	1	365	300986	-.93	-14.12	-298839	1	1
COMMODORE COMPUTER	1	434	300686	-.88	-7.47	-710000	3	1
LES MILLS FITNESS	1	353	300686	-.84	-5.21	-536910	3	2
N.Z. SKIFIELDS	1	295	311287	-.84	-5.10	-750000	3	3
GAZE HOLDINGS	1	245	311287	-.81	-4.26	-897226	3	3
MASPORT LIMITED	2	626	310386	-.81	-4.33	-4225000	3	1
RANK GROUP LIMITED	1	428	310388	-.80	-4.07	-802632	3	1
DE REDCLIFFE GROUP	1	275	300688	-.76	-3.19	-480991	3	3
ARAHU PROPERTIES	1	253	310786	-.69	-2.21	-165214	3	3
ENVIRON CORPORATION	1	366	310388	-.68	-2.09	-1133000	3	NA
HORNER GREENLEES	2	530	310788	-.67	-1.99	-1425000	4	3
CARDRONA SKI AREA	2	645	311286	-.57	-1.32	-515341	4	1
ARTHUR BARNETT PROP.	2	690	310788	-.54	-1.20	-124686	3	1
AITKENHEAD GROUP	2	496	310387	-.53	-1.12	-593000	2	1
HELICOPTER LINE	2	721	310388	-.52	-1.08	-1318249	3	1
HORTICULTURAL IND.	2	407	310385	-.47	-.88	-507692	2	1
COMMODORE COMPUTER	2	799	300687	-.46	-.86	-461000	3	1
MICHAEL HILL INT'L	1	387	300688	-.45	-.82	-725000	3	1
MOYES AND GROVES	1	197	310384	-.43	-.75	-387443	3	3
HELICOPTER LINE	3	1086	310389	-.41	-.69	-1374771	3	1
CAVALIER CORPORATION	1	134	310384	-.37	-.59	-895000	3	2
CARDRONA SKI AREA	1	280	311285	-.37	-.59	-200256	4	3
LASERCORP HOLDINGS	2	485	310388	-.36	-.56	-1658000	3	3
NORTHROP INSTRUMENTS	2	516	310386	-.36	-.57	-308169	3	2
PERRY DINES CORP.	1	39	310384	-.35	-.54	-377000	3	NA
THE TERRACE PROJECT	1	320	311286	-.35	-.26	-74000	4	3
DAMBA FURNITURE WORK	2	489	310388	-.31	-.44	-423000	1	1
N.Z. MARINE FARMS	1	418	311285	-.27	-.21	-148000	4	1
BATLEY PRINTING	1	311	300985	-.24	-.32	-245949	4	3
CARDRONA SKI AREA	3	1010	311287	-.24	-.31	-260124	4	1
GREENHOUSE PARK	1	78	310885	-.22	-.27	-99208	4	NA
QUEENSTOWN RESORTS	2	430	300686	-.21	-.27	-171000	4	2

PERRY DINES CORP.	2	404	310385	-.16	-.19	-189000	3	3
SKEGGS CORPORATION	1	55	300687	-.15	-.18	-1483000	4	1
MICHAEL HILL INT'L	2	752	300689	-.12	-.13	-292000	3	1
LAURENSONS BAKERY	2	497	310785	-.08	-.08	-13886	3	1
MASPORT LIMITED	1	261	310385	-.08	-.09	-397000	3	2
POWERCORP GROUP	1	293	300685	-.02	-.02	-11000	2	2
GOLDCORP HOLDINGS	1	63	310387	-.01	-.01	-19000	4	2
GREENHOUSE PARK	2	443	310886	.00	.00	-1867	4	2
REGAL SALMON LIMITED	1	21	300986	.00	.00	0	3	NA
GREENHOUSE PARK	3	808	310887	.01	.01	3191	4	1
BANK OF NEW ZEALAND	1	47	310387	.02	.02	3473000	1	2
ARTHUR BARNETT PROP.	1	325	310787	.03	.03	5174	3	2
ANGORA CORPORATION	1	395	300686	.04	.04	8220	4	1
BANK OF NEW ZEALAND	2	412	310388	.04	.04	6640000	1	3
DAMBA FURNITURE WORK	1	124	310387	.04	.04	15000	1	1
FIRST CITY FINANCE	2	535	310385	.05	.05	17034	2	2
UNITED TRANSPORT	1	296	310385	.05	.05	37728	4	2
HELICOPTER LINE	1	356	310387	.06	.05	79854	3	3
INVESTMENT FINANCE	3	912	310386	.06	.06	59681	1	1
TECHNIGROUP HOLDINGS	1	197	280286	.06	.06	52511	4	2
LES MILLS FITNESS	2	718	300687	.07	.07	74000	3	1
MORTON EQUITIES	2	488	300688	.08	.08	106556	3	1
VIKO HOLDINGS	1	258	311284	.10	.09	108119	3	2
CARBORUNDUM N.Z.	1	361	310385	.11	.10	102321	3	1
CITY REALTIES	1	244	300687	.11	.10	268000	4	2
AIC FINANCE	1	287	311284	.12	.11	91000	2	2
BANCORP HOLDINGS	2	750	310389	.12	.11	542000	2	3
MORTON EQUITIES	1	123	300687	.12	.11	38837	3	1
RENOUF CORPORATION	1	213	310385	.12	.11	239000	1	1
TECHNIGROUP HOLDINGS	2	562	280287	.15	.13	290368	4	1
NORTHROP INSTRUMENTS	1	151	310385	.20	.16	137534	3	2
STEVENS KMS CORP.	1	137	310386	.20	.17	297000	3	2
LAURENSONS BAKERY	1	132	310784	.21	.18	36301	3	3
FORTUNA CORPORATION	1	373	310385	.23	.18	140832	3	2
AITKENHEAD GROUP	1	131	310386	.25	.20	253700	2	3
HORNER GREENLEES	1	165	310787	.26	.21	114000	4	3

HORTICULTURAL IND.	1	42	310384	.27	.22	189466	2	2
FIRST CITY FINANCE	3	900	310386	.28	.22	155697	2	2
DALGETY CROWN CORP.	1	270	010884	.32	.24	4027000	1	2
STEVENS KMS CORP.	2	502	310387	.36	.27	1194000	3	1
MAINSTAY PROPERTIES	1	418	311284	.38	.28	79800	2	2
CITY REALTIES	2	609	300688	.39	.28	1166000	4	1
GROCORP PACIFIC	1	363	300985	.39	.63	236300	4	1
CEREBOS GREGGS	1	365	310785	.43	.30	1087000	1	2
LASERCORP HOLDINGS	1	120	310387	.47	.32	374000	3	2
DALGETY CROWN CORP.	2	635	010885	.57	.36	8282000	1	2
GENERAL PROPERTIES	1	424	311084	.57	.36	326000	2	3
RAINBOW CORPORATION	1	124	310784	.60	.38	126058	4	2
WILLIAMS PROPERTY	1	437	311284	.75	.43	428266	1	1
APPLE FIELDS LIMITED	1	22	300986	.92	12.03	299147	3	2
NORTHLAND FM RADIO	1	177	310385	1.05	22.75	173144	3	1
BANCORP HOLDINGS	1	385	310388	1.06	.51	2369000	2	2
STARS CORPORATION	1	5	310587	1.12	.53	532000	3	1
MAINZEAL PROPERTIES	1	337	300987	1.28	.56	1962429	1	3
N.Z. SALMON COMPANY	3	930	310386	1.33	.57	799000	3	2
CHARTER CORPORATION	1	495	300685	1.53	.61	615000	1	2
QUEENSTOWN RESORTS	1	65	300685	1.63	2.58	49000	4	NA
ENERGYCORP INV.	1	150	300687	1.65	2.55	270000	3	NA
EQUITICORP HOLDINGS	1	349	310385	1.68	.63	3317000	1	2
RENOUF PROPERTY DEV.	1	213	310386	1.75	.64	622000	3	2
RAINBOW CORPORATION	2	489	310785	1.76	.64	893848	4	2
BAYCORP HOLDINGS	1	391	300687	1.92	.66	3671870	4	2
INVESTMENT FINANCE	4	1277	310387	2.17	.68	3445000	1	1
FIRST CITY FINANCE	1	170	310384	2.47	.71	12358	2	2
GROWTHLINK HOLDINGS	1	355	310188	2.56	.72	6400000	3	1
REGAL SALMON LIMITED	2	386	300987	2.70	1.59	62000	3	2
N.Z. SALMON COMPANY	2	565	310385	2.81	.74	562000	3	1
CHARTER CORPORATION	2	860	300686	2.84	.74	1522000	1	2
INVESTMENT FINANCE	1	182	310384	3.05	.75	415302	1	3
INVESTMENT FINANCE	2	547	310385	4.01	.80	2021060	1	3
APPLE FIELDS LIMITED	2	387	300987	5.79	1.21	398950	3	2
WAIKATO STUD LIMITED	1	296	310385	6.55	.87	491314	2	2

EQUITICORP HOLDINGS	2	714	310386	8.50	.89	27210000	1	1
APPLE FIELDS LIMITED	3	752	300988	10.01	1.11	713288	3	1
REGAL SALMON LIMITED	3	751	300988	11.00	.92	440000	3	2
WOODSTOCK INVESTMENT	1	322	310787	15.84	.94	293507	4	2
EQUITICORP HOLDINGS	3	1079	310387	23.39	.96	10000000	1	1

^a Listed by size of SRE1 - see footnote c.

^b In days.

^c Bias measure with absolute forecast profit as denominator.

^d Bias measure with absolute actual profit as denominator.

^e 1 = net profit after tax only; 2 = net profit before and after tax; 3 = revenue, net profit before and after tax; 4 = revenue, net profit before and after tax, and breakdown of operating expenses.

^f 1 = no reference to forecast deviation in the appropriate annual report; 2 = reference to forecast deviation but no explanation for deviation; 3 = reference to and explanation for forecast deviation.

^g 'NA' means the information required was not available. The actual results used to calculate the forecast error measures were in these cases obtained from sources other than annual reports.