INTRODUCTION

The purpose of this commentary is to draw together the results of some research on analysts' earnings forecasts and analysts' decision processes and to discuss their implications. I will focus first on how analysts' earnings forecasts are used in empirical accounting research on the relation between earnings and stock prices and second on what is known both about the statistical properties of these forecasts and about the decision processes of analysts and the incentives they face.

Overall, these remarks are intended to suggest that a focus on analysts primarily as sources of earnings predictions seems unduly limiting. Just as we study auditor decision processes because of the intimate relation between auditing and accounting on the preparer side, it makes sense to study analyst decision processes because analysts are among the primary users of financial accounting information. (Indeed, this user focus appears to be the motivation for at least part of the judgment/decision making literature which uses analysts as subjects.) Given their importance as intermediaries who receive and process financial information for investors, it makes sense to view analysts— sophisticated users—as representative of the group to whom financial reporting is and should be addressed. Under this perspective, accountants have a policy-based stake in understanding how analysts actually use financial information.

In addition, just as some research into auditor judgments has implications for the education of future practicing professional auditors, so too could we draw on results of research into analyst decision processes to shape the education of future users of accounting disclosures, again represented by financial analysts. There is no logical reason why we should focus heavily on auditor judgments and decision processes and take relatively little interest in the judgments of analysts, in how they process information and in how we (as educators) can better prepare them for their careers. In addition, a clear understanding of how financial accounting information

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This commentary is not intended to provide a review of the literature on analysts' forecasts. Papers discussed are chosen merely to illustrate certain points, many or all of which might appear in other published and unpublished research as well. For a review of the literature to 1983, see D. Givoly and J. Lakonishok, "Properties of Analysts' Forecasts of Earnings: A Review and Analysis of the Research," Journal of Accounting Literature 3, 1984, pp. 117-152.

For a review and analysis of the judgment/decision making literature which focuses on individual users (including, for example, student subjects, lending officers and analysts), see L. Maines, "Judgment and Decision-Making Research on External Users at the Individual Level," working paper, Duke University, July 1991.

While no logical reason precludes detailed investigations of financial analysts, certain logistical and historical conditions make such research relatively more difficult than research using auditors. First, some firms simply preclude their analysts from participating in questionnaire studies. Second, the absence of continuing education requirements means that analysts need not gather periodically (as auditors must) for training away from their day-to-day responsibilities. Third, researchers in accounting (as well as other areas) have not so far succeeded in convincing employers of financial analysts that time and energy should be allocated to participation in completing experimental tasks developed for academic research. Finally, to the extent that accounting academics have prior work experience as auditors, and not as analysts, they may be more attuned to research which bears more directly on auditing.
is actually used should improve our ability to teach financial accounting courses to all students, including those planning careers that involve the preparation (as opposed to the use) of financial statements.

This commentary has several specific objectives. One is to consider apparent motivations for first, our uses of analysts' earnings forecasts as inputs into empirical research on the earnings-price relation, and second, our investigations of the forecasts' properties. In light of this consideration, a second objective is to lay out some questions that may serve to broaden our investigations. A third objective of this commentary is to point out what appear to be neglected relations between judgment/decision making research on analysts' decision strategies and capital markets-based research that either focuses on or uses analysts' forecasts. I believe that accounting research could draw on these relations to develop more insightful investigations of how financial information is processed by sophisticated users. The results of such investigations would have immediate applicability to the standard-setting process, given the user orientation articulated by the Trueblood Committee and the Financial Accounting Standards Board.

Relatedly, I will discuss how a direct consideration of what decisions and judgments analysts actually make and what incentives they face might help to shape future investigations. Specifically, the focus of accounting research on analysts' forecasts is essentially a focus on just one part of the total responsibilities of a financial analyst; the question arises, how would we view these forecasts and their properties if we studied them as an input to the ultimate analyst judgment—what recommendation to make on a stock.

In considering the role of earnings forecasts in shaping the analyst's recommendation about a stock, it sometimes makes sense to distinguish between buy-side and sell-side analysts. While both make recommendations about which stocks to buy, sell and hold, sell-side analysts are the primary producers of earnings forecasts. Buy-side analysts tend to be employed by money management firms or institutional investors while sell-side analysts tend to be employed at broker/dealer firms that serve individual and institutional investors. Thus the buy-side analyst may in fact be a user of sell-side analyst reports as one input into his own decision process. Clearly, some but not all of the tasks are similar for buy-side and sell-side analysts; because their employers are so different, they most likely face dissimilar incentives. For the most part, capital markets research discussed in this commentary deals with sell-side analysts, while judgment/decision making research uses buy-side analysts as subjects. In some experimental research, I was not able to tell from the context whether the analyst-subjects were buy-side or sell-side analysts. However, the stock recommendation decision is common to both.4

This commentary contains six sections. The following section discusses a common use of analysts' earnings forecasts in capital markets research; the third section comments on empirical investigations of the statistical properties of analysts' forecasts; the fourth section places the forecasting task within a larger decision context; the fifth section discusses judgment/decision making research on analysts' decision processes. A final section contains some conclusions.

**Uses of analysts' forecasts in empirical capital markets research on earnings and stock prices.** In recent years, accounting researchers have adopted analysts' forecasts as a proxy of choice for market earnings expectations; the idea is to identify with greater precision and accuracy the unanticipated portion of earnings (i.e., the earnings forecast error). In a typical application, an earnings forecast error is computed as the difference between actual earnings per share and a measure based on analysts' forecasts. In some cases, the measure is a "consensus" forecast prepared from a number of forecasts submitted by analysts em-

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4For buy-side analysts, recommendations to buy a stock may be executed immediately as part of a planned investment strategy. For sell-side analysts, recommendations involve placing stocks on a "buy" list, disseminating written reports, and making recommendations to appropriate clients.
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ployed at brokerage firms and provided by a vendor such as the IBES service of Lynch, Jones and Ryan. In other cases, the measure is a single forecast provided by a commercial investment advisory service such as Value Line. Various approaches are used to standardize the earnings forecast error, including division by the earnings number and division by share price. The standardized earnings forecast error is then an input into an investigation of some question associated with the relation between earnings and share returns.

An alternative proxy for market earnings expectations is a prediction from a statistical model based on past realizations of earnings. Such a proxy has the advantage of being readily computable for any firm with a history of earnings—for a simple random walk model, only one past earnings release is required. Analysts’ forecasts, in contrast, are not available in machine-readable form until the mid-to-late 1970s and they are not available at all for firms that are not followed by analysts (usually smaller and newer firms). The question then arises, what gives rise to the preference for analysts’ forecasts? The preference seems to stem from two considerations: accuracy and association with stock return prediction errors (abnormal returns) at earnings announcements. That is, analysts have consistently been shown to forecast earnings more accurately than do mechanical models and at least some research has found a stronger association between the market response to earnings and forecast errors based on analysts’ forecasts than between the market response to earnings and forecast errors generated from mechanical models.

It would be exceedingly surprising if analysts lacked the capability to forecast earnings at least as accurately as a mechanical model based only on historical earnings. Analysts have access to more information to project future earnings than the accounting system has to produce the earnings number; an example of such information is order backlogs. In addition, analysts have direct access to the statistical models themselves. Therefore, a surprising degree of incompetence or an exotically perverse objective function would be required for analysts to lack the capability to equal or exceed the predictive accuracy of models based only on past earnings most or all of the time.

The market association issue is a bit less clear than the predictive accuracy question. The reason is that aggregate (i.e., market) expectations are unobservable by definition, and all our inferences about these expectations are of necessity drawn from a priori reasoning and indirect tests. An example of the former is: analysts influence investors with their forecasts and recommendations, so we expect their views will mirror or summarize those of investors generally. An example of the

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9 For a description of the various sources of analysts’ forecasts and the degree to which the forecasts correspond to commercially-available sources of earnings announcements (such as Compustat), see D. Philbrick and W. Ricks, “Using Value Line and IBES Forecasts in Accounting Research,” Journal of Accounting Research, 29:2, Autumn 1991.


This argument assumes that the analyst wishes to maximize forecast accuracy unconditionally, and various incentives faced by the analyst may undercut this goal. In addition, there is some empirical evidence that might be viewed as inconsistent with superior analyst forecast accuracy. First, not all empirical comparisons of analyst and model predictive ability have found analysts to be superior. For a discussion, see L. Brown and M. Rozeff, “The Superiority of Analyst Forecasts as Measures of Expectations: Evidence from Earnings,” Journal of Finance XXXIII: 1, March 1978, pp. 1-16. Second, research on diagnosis has in some cases found that linear models provide better diagnoses than experts. See, for example, R. Dawes and B. Corrigan, “Linear Models in Decision Making,” Psychological Bulletin 81:2, February 1974, pp. 95-106 and R. Dawes, D. Faust and P. Meehl, “Clinical versus Actuarial Judgment,” Science 243, March 31, 1989, pp. 1668-1674. Note that in a diagnosis task the linear models in question differ from historical earnings models in that linearity is not an issue and the linear models are not restricted to just one kind of information. Thus, the possibility exists that a linear model (i.e., a lens model) incorporating variables in addition to past earnings realizations could prove more accurate than analysts in forecasting earnings.
latter is examinations of the properties of an earnings-return relation estimated using various proxies for earnings expectations. Unambiguous interpretations of the indirect tests are, however, impeded by several pieces of related evidence. This evidence supports the view that share returns at earnings announcements are in fact not fully responsive to current earnings information; price responses at earnings announcements appear to be consistent with earnings expectations derived from a relatively naive mechanical model (as opposed to an analyst forecast) and earnings themselves appear to explain extremely modest percentages of the cross-sectional variation in returns at earnings announcements. If we do not completely understand what is driving the market response to earnings announcements, then perhaps we should be cautious in using that response to draw definitive conclusions about the preferred proxy for pre-announcement earnings expectations.

Our uses of analysts' earnings forecasts imply a certain decision process on the part of investors, but this implication has not been directly examined. For example, while accounting researchers use earnings forecasts without adjustment and often without other measures to measure or proxy for market expectations of earnings, there is no compelling reason to believe that market participants use such forecasts the same way. Investors may, for example, adjust the reported forecasts in some way to take account of other information about either the firm in question or the forecasting process itself. In particular, institutional money managers would be unlikely to use analysts' forecasts as received, because such behavior would imply no special analytical expertise on their part. It seems more likely that money managers examine the contents of several analysts' reports, including the earnings forecasts and specific stock recommendations, and form their own judgments.

The usual regression approach to evaluating the earnings-share price relation, based on a standardized earnings forecast error, implies a linear loss function based on earnings forecasts as reported. But this function may not be descriptive; some circumstantial evidence that investor loss functions are not linear in forecast accuracy is found by considering the empirical regularity that share price

See, for example, L. Brown et al. (JAE, July 1987). They examine the earnings-return relation using five proxies for market expectations. Four of the proxies are based on statistical models and the fifth is Value Line forecasts. They report that proxies based on Value Line forecasts have the highest associations with abnormal returns, especially when the proxies are adjusted for measurement error. In contrast, O'Brien (1988) finds that forecast errors from a quarterly autoregressive model of earnings have a stronger association with abnormal returns than do errors based on analysts' forecasts obtained from IBES. See P. O'Brien, Analysts' Forecasts as Earnings Expectations, Journal of Accounting and Economics 10:1, January 1988, pp. 53-83.

Numerous studies document what appears to be a predictable lagged share price response to quarterly earnings announcements (i.e., a post-earnings-announcement drift). See, for example, V. Bernard and J. Thomas, "Post-Earnings-Announcement Drift: Delayed Price Response or Risk Premium?" Journal of Accounting Research 27 supplement 1989, pp. 1-36. This study reports that share reactions to earnings announcements are consistent with expectations based on a seasonal random walk model. For a summary and discussion of the modest explanatory power of earnings for returns, see, for example, B. Lev, "On the Usefulness of Earnings and Earnings Research: Lessons and Directions from Two Decades of Empirical Research," Journal of Accounting Research 27 supplement, 1989, pp. 153-192.

There is some evidence that investors adjust reported earnings to take account of other information; see, for example, B. Lev, op. cit. Lev finds that in a regression of residual returns on change in earnings, the explanatory power of the regression increases from .06 to .09 when earnings are adjusted for the effects of early adoption of SFAS 87 (the usual effect of this early adoption was to increase earnings but not cash flows because of the partial write-off of the excess of pension assets over pension liabilities). There is also some evidence that the usefulness of analysts' forecasts as proxies for market expectations is enhanced if the researcher adjusts for information released after the forecast announcement but before the earnings announcement by including the share returns during this interval. See Brown et al. (JAE, April 1987).

This conjecture about the likely behavior of sophisticated investors begs the question of whether profitable trading strategies can be constructed from analysts' forecasts. Research based on price or returns forecasts—as opposed to earnings forecasts—indicates that such trading strategies are possible. For an example, see L. Brown, G. Richardson and C. Trzcinka, "Strong-form Efficiency on the Toronto Stock Exchange: An Examination of Analyst Price Forecasts," Contemporary Accounting Research 7:2, Spring 1991, pp. 323-346.
responses to unfavorable earnings surprises are not mere mirror images of responses to favorable surprises—this evidence is not conclusive, but it is suggestive of the possibility that our current assumptions about how investors use earnings forecasts are not rich enough to capture their behavior.

It appears, then, that relying on analysts' earnings forecasts as proxies for market expectations is supported by evidence based on accuracy and market association tests. But some assumptions about analysts' and investors' loss functions and decision processes underlying this reliance are rarely if ever explicitly spelled out and examined by researchers, and these assumptions may in fact be inconsistent with how forecasts are actually generated and used. Instead, accounting researchers have focussed on describing the properties of the forecasts and related error metrics, as I discuss in the next section.

Investigations of the properties of analysts' earnings forecasts. A number of detailed investigations of analysts' earnings forecasts have been published. This research has tended to focus on issues like dispersion among forecasts, accuracy of forecasts as a function of timeliness, bias, the characteristics of various forecast error metrics, and degree of association between forecast disclosures and share price reactions. The motivation for these investigations appears to me to stem from thinking of analysts' forecasts primarily or even exclusively as proxies for market earnings expectations. For example, Brown and Rozef(1978) motivate their investigation of forecast accuracy by stating (p. 1) "Accurate measurement of earnings expectations is essential for studies of...the relationship between unanticipated earnings and stock prices." In other words, the primary driving force for the investigation of forecast accuracy is not curiosity about the functioning of the decision process which generates the forecasts; instead it is the forecasts themselves, and in a particular use, that are of special interest.

There is, however, an emerging theme in this research which takes the form of a movement away from documentations of the statistical properties of forecasts and measures of forecast errors and toward investigations of what information appears to be impounded in these forecasts. The motivations for such investigations are closer to a decision context since they include uncovering the sources of analysts' forecast superiority relative to mechanical models and testing for whether analysts appear to make full and rational use of all information available to them.

An example of research into the factors which generally determine, or at least are generally associated with, analyst earnings forecast superiority is Brown, Richardson and Schwager (1987). The theoretical underpinnings of their investigation relate analyst forecast superiority to very general constructs that are in no way specific to a particular kind of firm or decision setting: the dimensionality of the information set (how much there is to know), inherent variability of the underlying series and the degree to which the various bits of information available to the analyst are independent. The empirical proxies used are firm size, dispersion of forecasts and the number of lines of business of the firm whose earnings are being predicted. While it is not possible given available evidence to investigate the degree to which these proxies capture the underlying constructs of interest, it is clear that these variables—in particular, firm size—have been shown to be associated with other
firm characteristics. On the other hand, it is difficult to see how more specific proxies could be found for the very general constructs being considered; thus the generality of the investigation reinforces the credibility of the association tests while making it difficult to provide precise and unambiguous interpretations.

At the cost of a potentially severe loss of generality, it may be possible to avoid at least some problems associated with using empirical proxies for very general forces believed to be driving analyst forecasting behavior (and the superiority of analysts' forecasts to those derived from mechanical models) by considering, for certain well-defined cases, how analysts deal with specific information situations. Two examples that illustrate this kind of research are Kim and Schroeder (1990) and Biddle and Ricks (1988).

Kim and Schroeder investigate whether analysts act as if they both believe the bonus maximization explanation for earnings management and adjust their earnings forecasts to take account of accruals manipulations by managers. Their tests are predicated on the notion that if earnings management behavior arises from bonus incentives, then forecast errors in the discretionary accruals portion of earnings should either offset or reinforce cash flow forecast errors, depending on where the earnings fall relative to the bounds of short-term income-based bonus plans. This investigation presumes analysts are shrewdly aware of various forces affecting reported earnings and capable of using available information to take account of these forces in developing forecasts. Clearly, no mechanical model is likely to capture these effects, so their ability to adjust for earnings management behavior may well be a force driving analysts' earnings forecast superiority.

In contrast to the Kim and Schroeder finding, which focussed on ongoing behavior, Biddle and Ricks document that analysts systematically overestimated the 1974 earnings of the 1974 LIFO adopters, even when the analysts knew of the LIFO adoptions. Obviously, while a mechanical model could not have easily been constructed to deal with this situation either, Biddle and Ricks find evidence that analysts do not always fully impound the effects of a one-time intervention in the earnings process in their forecasts. Given the one-time nature of the forecasting task, it is not possible to determine whether the substantial earnings forecast errors were due simply to an abrupt shift in inflation that was not predictable given the best available information or to a failure to take full account of all available information.

Recent investigations of information used by analysts have begun to focus on settings that are still highly structured (as in Kim-Schroeder and Biddle-Ricks) but more general—in particular, whether analysts' forecasts and forecast revisions appear to impound all the information in prior stock price changes and earnings releases, and whether forecasts contain information even when they are associated in time with either other forecasts or firm-specific disclosures. Results, discussed in more detail below, support the information content of analysts' forecasts regardless of the presence of competing disclosures and also indicate that analysts' forecasts do not impound all available earnings and stock return information.

With regard to competing disclosures, Lys and Sohn (1990) investigate several aspects of the relation between analysts' forecast revisions and share price reactions. They find that while forecast revisions are positively associated with prior share returns and market returns (indicating that the revisions take account of some or all of the information impounded in these returns), the association is not complete. That is, the earnings forecast error based on the revised forecast is associ-


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ated with share returns and market returns preceding the revision, consistent with the view that analysts do not incorporate in their earnings forecasts all information available in share returns and market returns. The magnitude of the "missing" explanatory power is about 34 percent of the total explanatory power of the regression of revisions on share returns and market returns. Based on similar regression analyses, Lys and Sohn conclude that analysts' forecasts are based on information that is partly independent across analysts and partly independent of corporate disclosures.

Using different databases and different research designs to answer somewhat different questions, both Klein (1990) and Abarbanell (1991) confirm the Lys and Sohn results. Abarbanell's research is motivated directly by the use of analysts' forecasts as proxies for market earnings expectations. He points out that the extent to which analysts' forecast revisions merely reflect the information impounded in share returns preceding the revisions affects how such revised forecasts can be interpreted as market earnings expectations. Using Value Line data, he finds an association between prior returns and both forecast revisions and forecast errors based on those revisions, and he interprets these results in a way that reinforces the interpretations of Lys and Sohn.

Klein's research is motivated by a cognitive bias theory put forward by DeBondt and Thaler (1987, 1990) to explain what they regard as an overreaction to extremes of earnings changes and returns. She tests whether analysts systematically underpredict earnings following large share price declines and overpredict earnings after large price increases, and finds no evidence that they do. The evidence instead supports nonsymmetric forecasting behavior that seems to tend to optimism in the face of bad news; specifically, forecasts after price declines are optimistic (i.e., the forecasts exceed the actual earnings) and forecasts after price increases are neither optimistic nor pessimistic (i.e., there is no particular bias in the forecast errors).

A related series of papers has considered how analysts respond to earnings information (as opposed to share price change information) in making and revising forecasts. These papers appear to be motivated both by research on the forecast revision-share return relation and by evidence of anomalous stock price behavior around earnings announcements. For example, Mendenhall (1991) finds evidence of positive serial correlation in Value Line earnings forecast errors, as well as a positive relation between forecast revisions and returns around the subsequent earnings announcement. He interprets his results as indicating that analysts underreact to earnings information in forming their forecasts.

In research which investigates the potential links between analyst forecasting behavior and post-earnings announcement drifts, Abarbanell and Bernard (1991) bring together several strands of the research just discussed. Using Value Line earnings forecasts (where relatively precise dating is possible), they find that forecast extremes (relative to actual earnings) are eliminated after the first quarterly report. Thus, analyst overreaction to information (which might be earnings information) is apparent only in the early portion of the year. In addition, they find (consistent with Klein) that the most optimistic earnings forecasts (the biggest overestimates) are associated with firms that had weak earnings performance the previous year—in contrast, over-


reaction to earnings information implies that poor past earnings would lead to underestimation of future earnings (i.e., pessimistic forecasts). Ultimately, they conclude, as did Mendenhall, that analysts appear to underreact to past earnings signals—especially negative signals.

To summarize, it appears that analyst forecasts tend to be optimistic on average (that is, they appear to overestimate future earnings) when researchers examine samples of forecast errors without conditioning on prior information. When the forecast errors are conditioned on previous share return or earnings information, it appears that optimism is most prevalent in the face of bad news. In describing the complexity of the situation, Abarbanell and Bernard remark that a complete understanding of the results will probably require understanding why analysts, who are sophisticated market agents, would consistently appear to make the same kind of earnings forecasting error. One suggestion they offer to explain this behavior involves the incentive structure faced by financial analysts. Understanding analysts' incentives in forecasting earnings requires placing the forecasting task within the context of what the analyst does; the next section takes up this issue and offers some reasons why analysts might tend to be optimistic.

What do financial analysts actually do, and why do they forecast earnings? The general focus of accounting research on accuracy and bias of analysts' earnings forecasts has yet to capitalize on whatever opportunities for insights might arise from considering these forecasts in the context of what the analyst does and, relatedly, what incentives he faces. Both context and incentives will shape the properties of analysts' work products generally and their forecasts in particular. For example, one possibility is that incentives not contemplated in the usual tests of analyst forecast accuracy and bias operate to produce systematically biased forecasts. To explore this possibility, I will consider first the general analyst decision context and second two kinds of incentives faced by analysts. This focus on context and incentives may not necessarily be consistent with some psychological theories of information processing which predict that individuals engaged in forecasting will be subject to psychological forces that are not likely to be strongly influenced by incentives.

The basic responsibility of an analyst is to follow stocks—10 to 20 stocks in a given industry or economic sector. The ultimate product of sell-side financial analysis is a report evaluating a firm's securities; for our purposes, we can assume the analyst is focusing on common stock. Within the analyst's report, the ultimate judgment recommending an explicit action is "buy, sell, or hold." To quote from a classic text on security analysis, "security analysis provides the basis for selecting individual issues to buy or sell from among available choices." Note that for a given analyst, the available choices are concentrated among related stocks, so the analyst in effect

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20In their research monograph, Brown, Foster and Noreen op. cit. report that for their sample and time period (1976-1986) the mean consensus forecast error is negative and the median is positive, indicating that the forecast errors arising from overestimates are larger than those arising from underestimates. There is, therefore, some evidence supporting optimism in this research. A tendency for optimism in analysts' forecasts is also reported for the 1983-1986 period by K. Butler and L. Lang, "The Forecast Accuracy of Individual Analysts: Evidence of Systematic Optimism and Pessimism," Journal of Accounting Research 29:1, Spring 1991, pp. 150-156.

21See, for example, J. Hunter and T. Coggin, "Analyst Judgment: The Efficient Market Hypothesis versus a Psychological Theory of Human Judgment," Organizational Behavior and Human Decision Processes 42:3, December 1988, pp. 284-302. Using samples of analysts' forecasts, they test a prediction of personal construct theory: financial analysts' judgments in making forecasts are influenced by their personal theories of earnings, taken to be the currently dominant financial theory. Hunter and Coggin also test whether analysts appear to overuse data consistent with the currently dominant theory. For the early 1960s, when time series theories of earnings growth were dominant, they find that analysts' forecasts are sensitive to historical earnings growth. For the period 1979-1983, when theories of market efficiency were dominant, they find that analysts' forecasts are sensitive to systematic risk from the Capital Asset Pricing Model. They reject the hypothesis that forecasts are based on all available information.

is engaging in prospective relative performance evaluation.

The process of forecasting earnings enters into the job of the financial analyst because the forecast is one of numerous pieces of information used to arrive at a recommendation.23 Thus, when we focus on earnings forecasts we are considering not a final product but rather an input into generating a final product. As one investment professional puts it: "Focusing on EPS forecasts, for example, makes as much sense as... judging a car manufacturer on his ability to forecast car sales, rather than to make better cars than his competition."24 Clearly, understanding how many cars will be sold is not immaterial to the ultimate objective, but it is not the ultimate objective. In fact, forecasting earnings is by definition subordinate to the goal of picking stocks and writing reports which support those judgments.25 This goal, combined with the incentives faced and information available, shapes the analyst's decision process, of which forecasting earnings is just one component.

The analyst's overall decision process has a loss function which in turn dictates the loss function associated with earnings forecasts. This function may or may not be captured by the usual measures we use for evaluating analysts' earnings forecasts, such as mean squared error. Consider, for example, the tradeoff between timeliness and accuracy of forecasting. To the extent having the forecast sooner (even at the cost of less accuracy) implies greater investing profits to consumers of analysts' earnings forecasts, the loss function implied by pleasing customers will create a preference for timeliness. Alternatively, readers of analyst reports may use forecast accuracy as a quantitative measure of the quality of the overall report; this effect will create a preference for accuracy, possibly even at the expense of timeliness.

Nor is it transparent how earnings forecasts are affected by the incentives faced by analysts. It is clear from the amount of attention devoted to earnings forecasts in the financial press, and the presence of commercial vendors of such forecasts, that these numbers are especially salient for investors. But it is not so clear how this salience is reflected in the overall incentive structure of the analyst's job within a firm. Specifically, sell-side analysts' research reports and recommendations are often part of a group of bundled services offered by full-service investment banking firms. Such firms offer merger and divestiture advice, brokerage services and underwriting services; they may have their own trading operations as well. For these firms, analyst research is overhead and does not in itself generate any sales revenues. Instead, revenues must come from providing brokerage services, merger and divestiture advice and underwriting, at least two of which have the potential to influence analysts' behavior.

A key revenue source for firms offering brokerage services is customer interest in firms they follow. Increasingly, institutions are the customers; within these institutions, buy-side analysts regard the reports of sell-side analysts as an important source of information.26 Therefore, analyst reports could be used

23The following description of the analyst's tasks is taken from a description of how top management can work effectively with financial analysts following the company. Analysts study the industry (including market research, industry statistics and the trade press), interview and possibly visit customers and suppliers, visit the company, interview management, analyze the financial statements to identify valuation drivers, value the stock and write a report containing a recommendation. Earnings forecasts are mentioned only as they affect the final report and the process of forecasting earnings is accorded only a minor role in the description. See S. Balog, "What an Analyst Wants from You," Financial Executive, July/August 1991, pp. 47-52.


25I do not mean to imply that earnings forecasts are other than an important, possibly essential, step in the task of preparing a report. For example, empirical evidence that analysts incorporate their earnings forecasts into their price forecasts is presented in S. Bandyopadhyay, L. Brown, and G. Richardson, "The Importance of Earnings Forecasts to Analysts' Stock Price Forecasts," working paper, SUNY at Buffalo, August 1991. For a sample of Canadian analysts' forecasts and Value Line forecasts covering the same firms, during 1983-1988, they find that analysts' earnings forecast revisions explain 48 to 72 percent of the variance in their price forecast revisions.

26Other analysts are listed as the second most important source of information (after annual reports) by buy-side professionals in a survey reported in SRI International, Investor Information Needs and the Annual Report, 1987, Financial Executives Research Foundation, Morristown, New Jersey.
as part of a marketing effort to induce institutions to increase their holdings of a particular firm or firms. In turn, institutional interest in a particular firm provides an incentive for an analyst to begin following it. Thus, the decision processes of analysts associated with brokerage houses are linked with those of institutional investors and studying either in isolation ignores the feedback effects of the linkage. For example, certain properties of analysts' forecasts (such as timeliness, divergence from a consensus or quick revisions) may lead to greater institutional propensity to trade in the stock.

The joint analyst-institution decision process was investigated by O'Brien and Bhushan (1990). They examined year-to-year changes in analyst following and institutional ownership in a simultaneous equations framework and found that analysts prefer to follow firms where volatility is low and so is competition from other analysts, while institutions tend to prefer firms with pre-existing analyst following and with increasing size and risk. In particular, a previously-documented relation between analyst following and firm size is eliminated once institutions' decisions are simultaneously considered. Their results support the view that institutions' investment choices—which are generally not considered in investigations of analysts' forecasting behavior—causally influence at least one decision made by analysts, the decision of which firms to follow. The question then arises: does the presence of the institutional investor also affect the nature of the analyst's reports and (by implication) the properties of his earnings forecasts?

In terms of the demands and preferences of their customers, financial services firms that offer both underwriting services and analyst research face another influence that constitutes a potential conflict of interest: favorable reports and buy recommendations will help generate demand for the securities being underwritten and may help to solidify long-term business relationships. Thus, the analyst knows that his employer's revenues are influenced by how favorably he evaluates the client firm.

The conflict of interest generated by combining underwriting and analysis is not unlike the one faced by large public accounting firms who offer both audit services and consulting or management advisory services (MAS). In both cases, a professional judgment that is presumably used by market agents in making investment decisions could be subject to potential influence by the presence of a second, related income-generating activity, because the kind of judgment rendered could influence the client's perception of the attractiveness of the second activity. Also in both cases, it is possible to argue that the presence of both activities in the same firm has benefits that outweigh the likely costs of any conflict of interest. Specifically, auditors and consultants from the same firm can (it is argued) pool information about a client and analysts who are associated with underwriters will have better access to management and hence the basis for superior analysis and recommendations.

The analyst, however, faces a somewhat different and possibly more complicated situation than the auditor. Although the underwriting client can take his underwriting services business elsewhere if he is displeased with some aspect of the analysis and coverage provided (just as the audit client can take his MAS business elsewhere if he doesn't like the audit judgments provided) the underwriting client has another source of influence over the analyst: access to management. Specifically, irritated managers can make it very difficult for out-of-favor analysts to maintain any

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This point is made explicitly by Steven Balog, op. cit., Associate Director of Research at Lehman Brothers.

reasonable kind of contact. This source of influence on analyst reports would have no differential effect on analysts employed by firms with and without other kinds of business relationships with client firms. To the extent this influence exists and has widespread effects, it may help to account for the tendency for analysts in general to issue optimistic earnings forecasts, especially in the face of negative share returns and earnings signals.

While empirical investigations of the audit-MAS potential conflict are hampered by a general lack of objective outcome measures, and direct investigations of the possibility that analysts shade their forecasts to maintain good relations with and ready access to managers are impeded by an inability to identify and distinguish cases where such influences are and are not expected to exist, it is possible to conduct empirical investigations of the association between underwriting activities and the properties of analysts' earnings forecasts. One such investigation is Lin and McNichols (1991), who consider whether the forecasts of analyst-underwriters are more accurate or more optimistic than other forecasts and whether there is a difference in market reactions to forecasts depending on the presence of an underwriting relationship.

Based on preliminary results, Lin and McNichols find that analyst-underwriters are more optimistic but not more accurate than other analysts. However, this optimistic bias does not destroy the information content of the analyst-underwriters' forecasts, and weak evidence indicates that such forecasts may be viewed as more informative than those of other analysts. They do not investigate the buy, sell and hold recommendations of analysts; however, to the extent that optimistic forecasts are associated with relatively more frequent buy recommendations, Lin and McNichols' results would indicate that analyst-underwriters are influenced to be relatively more favorable about their employers' underwriting clients. The degree of optimism in analysts' recommendations, as well as the extent to which investors adjust for any such bias, are, of course, empirical questions.

There are thus two distinct but related considerations which seem likely to influence the properties of analysts' forecasts. The first involves incentives; analysts are subject to at least two kinds of pressures that arise from the nature of their jobs. Both buy-side and sell-side analysts rank company management among the top five sources of information used in making judgments and decisions, so it seems reasonable to expect that they would like to maintain good relations with, and ready access to, managers. In addition, to the extent their employers have other, revenue-generating business relationships with the firms the analysts follow, there is an incentive for the analyst to produce a report and recommendation which solidifies the revenue-generating relationship.

The second consideration is the notion that analysts are not paid merely to forecast earn-

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30 A loss of access to management is costly if analysts rely on management for information. "Company management" is listed along with financial reports as a key source of information for sell-side analysts; buy-side analysts rank "other analysts" as key in addition. Professional investors in general (including brokers and portfolio managers in addition to analysts) rank "company management" as the most important information source. See SRI International, op. cit. In addition, the popular financial press has carried stories that provide anecdotal evidence supporting both the importance of analysts' access to company management and the retaliatory denial of such access. See, for example, J. Laderman, C. Hawkins, and I. Recio, "How Much Should You Trust Your Analyst?" Business Week, July 23, 1990, pp. 54-56; E. Berg, "Risks for the Analysts Who Dare to Say Sell," New York Times, May 15, 1990, pp. cl-c6.

31 Given a sufficiently structured setting that is simultaneously rich enough to capture both the economic incentives and the institutional constraints facing firms providing both audit services and MAS, it may be possible to use laboratory markets approaches to investigate these issues. For an example of such an approach, see N. Dopuch and R. King, "The Impact of MAS on Auditors' Independence: An Experimental Markets Study," forthcoming, Journal of Accounting Research supplement, 1991. For a discussion of the pitfalls and problems associated with this approach, see J. Berg, "Discussion of 'The Impact of MAS on Auditors' Independence: An Experimental Markets Study,'" forthcoming, Journal of Accounting Research supplement, 1991.


33 See Table 4.5 in SRI International, op. cit.
ings. Rather, they are paid to pick stocks and to write reports which cogently support their recommendations. Therefore, it makes sense to consider the earnings forecasting process as one portion of a more complicated decision process culminating in a report and recommendation. Some judgment and decision-making research, discussed in the next section, has focussed on this kind of consideration.

Judgment and decision-making research on analysts' decision process. Intuitively, it seems clear that one potentially useful approach to understanding analysts' decision processes would be to present them with decision and judgment tasks that capture the information and incentive characteristics of their day-to-day activities. It also seems clear that this approach is likely to be even more difficult to make operational for analysts than it is for auditors, and it is certainly quite difficult there. For example, judgment and decision-making research involving auditors doesn't always present them with tasks that have the same degree of complexity they face on the job, and only fairly recently have researchers attempted to provide explicit incentives for auditor subjects. In addition, while practicing auditors have been quite willing to participate in academic research as subjects, practicing financial analysts have been rather more elusive in this regard.

I will discuss three basic approaches to research on analysts' decision processes that have appeared in the literature: regression analyses of judgments based on information supplied by the researcher; content analysis of analysts' reports; protocol analyses. In the research I will discuss to illustrate the first and third cases, no explicit incentives are supplied and no potential conflict of interest is established (e.g., between a truthful adverse evaluation and the possible loss of client goodwill). In the second case (content analysis), these issues do not arise in the same way, because there is no eliciting of responses from subjects—the research materials are essentially archival, not experimental.

In the area of regression analyses, Mear and Firth have published a series of papers investigating the decision processes by which 38 market professionals (analysts, portfolio managers, brokers) rated each of 30 stocks on risk and predicted 12-month returns for the same stocks. The materials supplied by the researchers were several market variables and accounting ratios plus one industry variable, chosen based on interviews with professionals and reviews of the literature. In an evaluation of the degree to which the subjects can explicitly express how they make decisions, the authors compared the subjects' weightings of the variables with weights implied by a regression model of their decisions (a Brunswik lens model). Specifically, subjects' predicted risk and return measures were regressed on the researcher-supplied information variables. Self-insight was measured as the correlation between the subject-supplied weights and the regression weights on the variables. As in other judgment and decision-making research, Mear and Firth found that their subjects overestimated the weights they placed on minor cues and underestimated the weights on major cues.

This research, like the statistical research on analysts' forecasts, focusses on what appear to be inputs to the work product of financial analysis (risk and return assessments) rather than the end product itself, the recommendation and the supporting report. In addition, the researchers severely limited the amount of information available to the subjects, possibly because they wished to use a Brunswik lens framework which employs all the available cues (researcher-supplied pieces

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34For an example of research involving auditors which incorporates financial incentives, feedback about past performance and a justification requirement—all of which are posited to be features of the auditor's work environment—see R. Ashton, "Pressure and Performance in Accounting Decision Settings: Paradoxical Effects of Incentives, Feedback and Justification," Journal of Accounting Research 28 supplement, 1990, pp. 148-180. On the other hand, no attempt was made to provide a task that could be expected to capture the kind of work auditors do; see V. Heiman, "Discussion of 'Pressure and Performance in Accounting Decision Settings: Paradoxical Effects of Incentives, Feedback and Justification,'" Journal of Accounting Research 28 supplement, 1990, pp. 181-186.

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of information) as right-hand side variables in a regression model. The advantage of such an approach is that the researcher can obtain statistical weights on all the cues; one cost of the approach is that the researcher must limit and quantify the information supplied.

In another inquiry based on the same data, Mear and Firth report that subjects differed considerably in the cues they used and the weights they appeared to place on various cues. While each subject was fairly consistent in his risk and return judgments across the 30 cases considered, between-subject variability in these judgments was rather high. Based on various statistical analyses, the authors conclude these differences are related to differences in emphasis among the cues provided—for example, some subjects focussed much more on profitability information than others. These results must be interpreted in light of the fact that the subjects were constrained in terms of available information; information usage patterns might shift in the presence of different and broader information sets.

The regression analysis of intermediate judgments based on researcher-supplied information has the advantage of control and fairly strong precision of analysis. The examples described here contain relatively sparse information environments, so that it is not clear to what extent the results obtained in such studies would carry over to richer environments. In contrast, content analysis of analysts' reports offers no control by the researcher, inevitably leads to some imprecision because of the need to code and quantify qualitative information, and offers a direct focus on the end product as it is actually produced.

One example of a direct examination of analysts' research reports is Govindarajan (1980). This research is motivated by an interest in whether financial statement users are primarily interested in cash flows or in earnings in making decisions. (Clearly, although the approaches differ, the motivation is related to that underlying the numerous capital markets studies of the incremental information content of cash flows and accruals.) The contents of 976 analyst research reports published in 1976-77 in The Wall Street Transcript were coded 1 to 6 depending on their relative emphasis on cash flows (1=only cash was analyzed) and earnings (6=only earnings was analyzed). Of these reports, 86.5 percent were rated 4, 5 or 6, indicating that in their written reports, analysts favored discussions of earnings.

What do these results mean for a consideration of analysts' decision processes? As Govindarajan points out, the reports are not records of the decision processes; they are instead the formal explanations of the recommendations. He notes that an examination of internal records would be required to distinguish between analysts' decision processes and the presentation of the outcomes of those processes. But this assessment may be too severe. First, a necessary condition for inclusion in the report is inclusion in the decision process, so the report sets a lower bound on the information items analyzed. (Clearly, the analyst may have used information in preparing the report that is not explicitly disclosed in the report itself.) Second, if the reports are regarded as justifications for the judgments, then perhaps their structure can be studied within the framework of the effect of justification requirements on decision processes. Third, some clues to the nature of and reasons for the apparent tendency to optimism might be found in the information provided and the way it is presented. Finally, protocol analysis is an alternative to examinations of internal records—such records could be chaotic since analysts do not, for example, face a requirement that they prepare workpapers (as auditors do).

Two published protocol analyses involving financial analysts are Biggs (1984) and Bouwman, Frishkoff and Frishkoff (1987).^38


(Continued on next page)
Based on information in the papers, it appears that the subjects were buy-side analysts. Biggs' protocol analysis was based on 11 analysts who were asked to choose which of five firms would have the greatest ability to generate income over the next three to five years; eight of the 11 subjects chose the same firm. He supplied 10 years of financial statements but no notes or schedules. While all subjects calculated ratios and trends, only four of the subjects predicted earnings explicitly.

The relative performance evaluation aspect of Biggs' task seems to be based on the way analysts follow firms; that is, they follow an industry or sector and try to choose the best performers from among these firms. On the other hand, the amount of information supplied was quite limited relative to what an analyst might actually be expected to use, and involved only accounting data. Interestingly, more than half the subjects made their choices without explicitly predicting earnings; given the nature of the task and the set-up of the research, it is not clear why this was so. For example, those who did not make an explicit earnings prediction may have wished to save time; they may have lacked some or all of the information they usually use to predict earnings; or they may have thought no earnings prediction was necessary for the task at hand. Note also that buy-side analysts may in fact purchase earnings forecasts from sell-side analysts, so that they may not be accustomed to making these projections as part of their jobs.

For whatever reason, these protocol analyses indicate that predicting earnings per se was apparently not regarded as a necessary step in the subjects' decision processes. Instead, the majority of the analysts based their relative performance evaluation on an evaluation of historical information. However, the protocol analysis as reported in the paper neither suggests nor rules out a combined decision process and model of earnings such that the analyst does a cross-sectional evaluation of historical data to obtain an implicit earnings prediction which becomes part of the basis for the final judgments.

Bouwman, Frishkoff and Frishkoff explicitly motivate their protocol analysis study of 12 financial analysts as an inquiry into the decision making processes used in financial statement analysis. Their task—to analyze a company and decide whether to eliminate it as a possible investment candidate or to process further—is clearly a part of the analyst's job. The subjects, all buy-side analysts, received a significant amount of accounting and other information—for example, several years of financial statements, a proxy statement, Standard and Poor's industry analysis, timely Wall Street Journal market information.

Bouwman et al. identified these goals as describing the behavior of their subject analysts: become familiar with the company, look for unusual items, look for reasons to reject the company as an investment candidate. The most frequently used information came from the income statement, performance ratios, and segment data. While income statement data were relatively heavily used as the analysts familiarized themselves with the company but not as they reasoned to a conclusion, segment data were fairly heavily used in the familiarization stage and they were the most heavily used items in the reasoning portions of the task. This finding, taken in conjunction with the fact that Biggs omitted notes and schedules from the information supplied to subjects, suggests that his analysts may have had to modify their decision strategies because some information they habitually use was missing.

In doing the task, the analysts used what Bouwman et al. call "templates" or images as summaries of many firm characteristics; for example, one analyst characterized the firm as "cyclical," a kind of shorthand device that aggregates many features. Clearly, developing such templates or images involves training, experience and memory, and it may be that the quality and complexity of an analyst's templates is one measure of expertise. As in the Biggs protocol analysis, earnings forecasting did not play a dominant role.

(Footnote 38 continued)
Neither of the two protocol analyses summarized here bears directly on questions that have occupied capital-markets based research involving analysts. It is possible, however, that the approach of asking an analyst to "think out loud" in forecasting earnings could be structured to shed some light on the reasons for the tendency to optimism in analysts' earnings forecasts. Given results which indicate that optimism seems to be most pronounced in forecasts preceded by share price declines or earnings declines, it may make sense to investigate decision strategies in extreme cases like these as well as more typical cases to ascertain whether and how the firm's financial condition affects decisions even in a laboratory setting where job-related incentives are absent.

Conclusions. Research on financial analysts using capital markets approaches has remained distinct from judgment and decision-making research in this area. The capital markets research appears to be largely driven by accountants' preference for using analysts' earnings forecasts as proxies for market expectations in investigations of the earnings-share return relation. As a result, there has historically been an emphasis on documenting the statistical properties of these forecasts. This emphasis is now beginning to shift, in that some researchers are beginning to consider the decision contexts in which forecasts are made and the incentives facing analysts. In addition, some questions of analysts' information use are being investigated indirectly.

In contrast, judgment and decision-making research on analysts' decision processes has largely ignored forecasting behavior in favor of general considerations of what information analysts use, and how. In part, this focus is reflected in the use of buy-side analysts as subjects; these persons may consume the earnings forecasts of sell-side analysts instead of or in addition to making their own projections. While this research has so far not attempted to place analysts in realistic settings in terms of incentives and conflicts of interest, it has in some cases focused on the analysts' final product (the recommendation and related report). In addition, the papers summarized here indicate that analysts tend to focus on earnings more than cash flows in their reports, that they do not necessarily explicitly predict earnings as an intermediate step in choosing a stock to recommend from a given group, and that they pay substantial attention to segment data when these are offered. Accuracy and bias, two major preoccupations of capital markets research, are not usually the focii of judgment and decision-making research involving analysts.

The capital markets and judgment/decision-making strands of analyst research may be drawn together if investigations of analyst under- or overreaction to price and earnings information are extended. Based on statistical evidence from capital markets research that suggests certain information is or is not fully reflected in forecast revisions, a detailed behavioral investigation in a controlled setting may be able to discover whether the analysts are (to take one example) using a particular decision rule that results in optimistic forecasts (i.e., systematic earnings overestimates) in the presence of negative price or earnings information. An alternative explanation, of course, is that analysts experience pressure from managers of companies they follow to be favorable even when at least some of the objective evidence would suggest otherwise.
REFERENCES


