

Analysts' Forecasts: What Do We Know After Decades of Work?

Mark T. Bradshaw*
Boston College

June 2011

SYNOPSIS: Sell-side analysts have been the subject of hundreds of academic studies. In this paper, I offer perspectives on the state of our understanding of analysts based on prior academic research. Additionally, several observations are offered, which question how descriptive certain widely held beliefs are in light of the evidence. These observations on the literature serve as both criticisms and suggestions for future research.

Data Availability: Data used in this paper came from publicly available sources.

* This paper is based on a presentation ("How do analysts forecast earnings, and what do they do with these forecasts?") delivered at a conference sponsored by the Center for Accounting Research and Education at the University of Notre Dame, organized by Peter Easton. I wish to thank Peter for the invitation to address this topic, and also Jim Wahlen and Robert Lipe for encouraging me to transcribe the presentation in this document. Very helpful comments were received from David Weber. All omissions or inaccuracies are my own.

Analysts' Forecasts: What Do We Know After Decades of Work?

INTRODUCTION

Accountants are interested in the production and use of financial information. Consequently, a large number of academic accounting studies are concerned with whether sophisticated users of financial data understand such information and how they process it. Sophisticated users include sell-side analysts, short sellers, institutional investors, regulators, the financial press, and other market participants. However, a seemingly disproportionate amount of research has focused on sell-side analysts. For example, Brown (2000) highlights over 575 studies on expectations research, most of which are devoted to sell-side analysts' earnings forecasts and stock recommendations. Additionally, as of early 2006 there are over 500 papers listed on ssrn.com that have some emphasis placed on analysts, with most of these being posted after 1995.

Clearly, interest in sell-side analysts is great. As a result of this interest, our understanding of their role in the capital markets has grown over the past several decades during which academics have extensively studied sell-side analysts. Our understanding of sell-side analysts' behavior is not only beneficial to academics interested in a working framework that describes capital markets, but is also of interest to practitioners who operate in these markets. Managers of public companies must be able to communicate with analysts, and in particular, need to understand what information they want and how they process and communicate it. Investors with limited abilities or time to analyze individual securities often rely on the work of sell-side analysts, typically through the

analysts' reports. Finally, regulators are keenly interested in the flow of information that facilitates functional and liquid markets, and analysts are one contributor to the critical flow of information.

The purpose of this commentary is to survey what we have learned about analysts' role in the capital markets and to comment on the state of our understanding of their analysts' activities. A primary conclusion is that our focus almost exclusively on earnings forecasts now obstructs the growth in our understanding of analysts' role in the capital markets. Whereas the initial reason researchers began examining analysts' earnings forecasts was to gauge their usefulness as a surrogate for time-series forecasts in studies of the efficiency of the capital markets, interest in analysts has grown such that analysts are perceived as an interesting economic agent in their own right, much like the literature that studies CEO's or CFO's. Thus, it is necessary for the literature to expand its focus on other activities performed by analysts and attempt to better model their incentives than has typically been done.

The literature on analysts is vast, and I make no representation to provide a comprehensive review of the literature. To the extent that I do mention specific studies, the citations are necessarily incomplete, so apologies are requested in advance. Second, to the extent that I mention work that I have done, it is done because it is convenient. Finally, many of the critical comments I have to make about the analyst literature are probably applicable to other streams of literature that purport to describe decision processes of capital market participants.

For those seeking comprehensive reviews of the literature, Givoly and Lakonishok (1984) provide a review of the very early literature, and Brown (1993)

reviews literature up through the early 1990s. Discussions by P. Brown (1993), O'Hanlon (1993), Thomas (1993), and Zmijewski (1993) of L. Brown's (1993) literature review are each excellent and almost orthogonal to one another in the points they raise. Zmijewski's (1993) discussion is particularly recommended as relevant to the current state of the literature, which will be revisited later in the paper. Kothari (2001) provides a comprehensive review of the broader capital markets literature, which encompasses studies on analysts. Finally, Ramnath, Rock, and Shane (2008) review the literature since 1993 and provide taxonomy of that research.

Finally, Schipper's (1991) commentary that appeared in this journal did not have as its purpose a comprehensive review of the literature, but it is part of the 'required background reading' on sell-side analysts. The tenor of many of my views on the literature are present in her commentary, and many of the observations made by Schipper (1991) are perhaps even more applicable in assessing the current state of our knowledge of analysts' activities than they were in 1991. Indeed, the title of my paper is derived from an observation that surprisingly little research has been produced since her review that capitalizes on several observations made in that commentary.

The rest of the paper proceeds as follows. The next section discusses how research on analysts fits in with other capital markets research. I then briefly summarize the evolution of the current state of knowledge on analysts. Following this summary, ten observations on regularities and widely held beliefs from this literature are discussed. Many of these beliefs are critiqued and challenged, the result being suggestions for further work. The final section concludes.

WHAT IS IT WE SEEK TO UNDERSTAND?

As mentioned above, there are hundreds of studies performed by academics, aimed at understanding various aspects of analysts' activities. After decades of research, and the associated attention on this research by both academics and practitioners, it seems reasonable to articulate what it is we have been attempting to gain from this collective effort. To provide a context for the discussion that follows, it is worthwhile describing the analyst's role within the capital markets. Figure 1a provides a schematic that describes analysts' activities.

The first aspect of figure 1a that is important is that analysts reach some coverage decision. Analysts generally specialize by industry (Dunn and Nathan 2005), but within an industry analysts (or their employers) must decide what particular stocks to cover. For practical purposes, analysts tend to cover firms within an industry that is biased towards larger firms. Next, for any given stock that is covered, the analyst has access to a wide array of information, including security prices, firm-specific financial and operating information, industry data, and macroeconomic factors. Presumably, the value-added activity of the analyst is, not surprisingly, 'analysis.' Analysis encompasses the process through which the analyst considers a company's strategy, accounting policies, historical financial performance, future prospects for sales and earnings growth, and ultimately a valuation and purchase or sell recommendation. Based on the analysis, the analyst presumably draws a conclusion, most succinctly conveyed by a purchase or sell recommendation, but conclusions are likely more complex than a discrete stock recommendation and are conveyed through various communication channels.

The analysts' conclusions are conveyed to clients, investors, company management, and other market participants via *formal* or *informal* channels. Formal channels are the source of most of the data examined by academics, primarily drawn from analysts' formal reports and morning broker notes – archived by data providers such as Value Line and I/B/E/S. Analysts also give formal presentations to major clients and other investor groups. Similarly, they communicate results of their analyses informally through brokerage client communication, press interviews, industry meetings and conferences, and also by coordinating meetings between institutional investors and the firm managers. The end result is that part of the information communicated to the markets can be assessed *ex post* in terms of earnings forecast accuracy, recommendation profitability, and so on. Underlying this entire process are qualitative factors that affect the information gathering, analysis, and communication processes such as the analyst's ability, incentives, integrity, responsiveness to clients, and other such behavioral effects.

A potential problem for academics attempting to use the body of knowledge generated from research on analysts is demonstrated in figure 1b. For the most part, research methods do not really measure the most interesting part of the schematic, which is the analysts' analysis. This is literally a 'black box' in the figure. However, this is only a potential problem. What academics generally do instead of directly observing the analysts' decision process of analysis is to examine correlations between inputs, outputs, and conditioning variables to understand the analysis process.

A general characterization of the literature is as follows. Outputs extensively studied primarily include earnings forecasts and recommendations. A long line of research simply examines distributional properties of these outputs. As for inputs,

researchers have primarily focused on prices and financial statement information. Additionally, recent research has begun to examine whether analyst ability and incentives affect the processing of inputs into forecasts and recommendations. The direction of a typical research study is typically two-way, meaning that the researcher measures a correlation between outputs (i.e., earnings forecasts, recommendations) and some other variable such as stock prices. For example, a typical approach is to examine whether forecasts or recommendations affect stock prices, as well as whether information in prices affects forecasts and recommendations. Other relations typically examined by researchers are unidirectional, examining whether inputs such as the information in financial statements is captured in earnings forecasts or recommendations. Similarly, researchers examine whether proxies for analysts' abilities and incentives affect the accuracy of forecasts and profitability of recommendations.

It should not matter that researchers do not directly observe the activities represented by the black box in figure 1b. In this literature, like many others that are archival in method, outputs from some economic setting are observed to infer how agents have behaved. For example, if forecasts made by analysts are observed and errors are measured, this can be informative about how well the analyst forecasted, which may give insight into the process by which the analyst derived the forecast. Indeed, most current studies designed to examine correlations between analysts' inputs and outputs draw conclusions in terms of what information analysts used, how they used this information, and whether the analysts 'fully used' such information. Unfortunately, the literature has evolved to the point where some penetration of the black box is now necessary to push the literature forward. The latter part of the paper discusses areas where this might be

possible. In summary, however, an important observation on the current state of the analyst literature is that it is almost exclusively based on indirect evidence.

The earliest research on financial analysts developed as a by-product of capital markets research focused on correlations between accounting earnings and stock prices. In that line of research, it was necessary to quantify the amount of ‘news’ in earnings announcements. Thus, a measure of ‘expected’ earnings was required, which was compared to earnings actually reported, allowing a quantification of the ‘unexpected’ component of earnings. In an informationally efficient market, this unexpected news should lead to immediate short-window stock price reactions.

The interest in tests of market efficiency and value relevance of accounting earnings prompted a significant amount of research on time-series modeling of earnings. This literature is extensive and generated much discussion about then new topics in the accounting literature such as earnings response coefficients (ERCs), ARIMA parameters, impulse response functions, and so on. This literature seems to have reached its peak during the late 1970s and early 1980s, at which time researchers gravitated towards using analysts’ forecasts of earnings as a substitute for the complex time-series models. This launched a number of studies that ran horse races between analysts’ forecasts and time-series models to see which was a better measure of the ‘expected’ component of earnings. Fried and Givoly (1982) are often given credit as the paper that supported the definitive conclusion that analysts are a better proxy for expected earnings than estimates from time-series models.

Although there remains scattered interest in the time-series properties of earnings, Kothari (2001) recently commented that the literature on time-series modeling of

earnings is “fast becoming extinct ... [due to] the easy availability of a better substitute: analysts’ forecasts are available at a low cost in machine-readable form for a large fraction of publicly traded firms.” As it became generally accepted that analysts’ forecasts were superior to time-series forecasts, academics became interested in a deeper understanding of analysts’ forecasts and analysts’ themselves. Among academic accountants, analysts were elevated to the status of an economic agent in the capital markets worthy of extensive study. As a result, more recent work attempts to understand analysts’ incentives, conflicts of interest, loss functions, and so on. Prior to briefly reviewing what we know about analysts, it is important to articulate why we *still* study analysts.

The cynical response to why academics still study analysts is that the data are easy and cheap to access. Several companies like First Call, I/B/E/S, Value Line, and Zacks maintain databases on the forecasts and recommendations of thousands of analysts covering thousands of companies, allowing easy use of these data by academic researchers. Perhaps an even more cynical response is that academics very much enjoy analyzing distributions (i.e., means, medians, standard deviations, etc.) and correlations. Analyst data are easily converted into variables that provide interesting distributions and correlations (e.g., signed forecast error, forecast accuracy, ERCs, etc.).

However, the real reason I believe research on analysts continues is that we are interested in how the capital markets function, and examining analysts furthers such knowledge. On one hand, analysts are one of the preeminent market information intermediaries, distributing forecasts and results of their analysis to institutional and individual investors. Thus, examining properties of the analysts’ forecasts and analysis

helps us understand the nature of the information that seems to be impounded in stock prices. Another perspective is that analysts are a good proxy for beliefs held by investors in general, so examining properties of analyst data provides insight into how investors in general utilize and process accounting information like financial statements, footnotes, and other financial disclosures. Finally, having elevated analysts to the status of an interesting set of economics agents for detailed study, it is intrinsically interesting to study what analysts do and how they utilize financial accounting information. This final reason explains most of the current work on analysts.

OVERVIEW OF WHAT WE KNOW (OR THINK WE KNOW)

Early survey research and anecdotal evidence suggest that analysts are voracious for all kinds of information (e.g., Tevelow 1971, Chandra 1974, Frishkoff, Frishkoff, and Bouwman 1984, Epstein and Palepu 1999). It is not surprising, however, that in responding to surveys, analysts would tend indicate they always prefer more information to less. It is one thing to simply express a desire for information and another to incur costs to acquire or process it, particularly given a drastic increase in the length of annual reports in recent years (Li 2006). Research on analysts' information needs and preferences is generally regarded as 'descriptive' and is frequently overlooked in empirical research. This is unfortunate, because investigations on what information analysts might use and how they use it should incorporate these findings, if for no other reason than to see if what analysts say is consistent with what it appears they actually do.

Prior to discussing specific observations on generally accepted findings in the literature, a very brief discussion of the evolution of the literature is in order. Figure 2

provides a timeline that highlights general trends in the literature between the 1960s and early 2000s. Let me again emphasize that this is not meant to be a literature review or a comprehensive summary of all primary questions examined. Additionally, figure 2 is employed as a heuristic to place the subsequent discussion of specific observations in context. The reader is directed to the literature reviews identified in the introduction for a full list of questions and a more comprehensive coverage of relevant studies. Also, I will provide very brief highlights of each paper, and the brevity of these oversimplified highlights will necessarily oversimplify and undersell the full contribution of the paper.

As previously discussed, the initial impetus for examining analysts forecasts was the need for a better proxy for earnings expectations to be used in capital markets research. This literature spanned approximately two decades (1968-1987) and appears in the lower left quadrant of figure 2. Brief highlights of notable conclusion from these studies are as follows:

- Cragg and Malkiel (1968): Five-year growth rates forecasted by analysts were no different than simple algebraic extrapolations.
- Elton and Gruber (1972): Annual forecasts by various groups (pension fund, investment advisors, investment bank analysts) were no different between naïve time-series model and each group of analysts.
- Barefield and Comiskey (1975): Analysts' forecasts outperformed a simple no-change earnings forecast model.
- Brown and Rozeff (1978): Analysts' forecasts outperformed 'less naïve' time-series models, especially at longer forecast horizons.
- Fried and Givoly (1982): Using a (then) large sample of panel data (100 forecasts per year for 1969-1979), analysts' forecasts were more accurate than those from various time-series models.
- Brown, Griffin, Hagerman, and Zmijewski (1987): Analysts' forecast superiority over time-series models is due to (i) a timing advantage and (ii) an information advantage.

These studies primarily appeared in finance journals, employed small samples relative to those typical in current analyst research (e.g., hundreds of observations vs. hundreds of thousands), and used research designs that ran horse races between different forecasts. Fried and Givoly (1982) is generally recognized as having provided the most compelling evidence that analysts are superior to time-series models and several years later, Brown et al. (1987) clarified the source of analysts' superiority. Thus, it took almost two decades for researchers to settle comfortably on the conclusion that analysts were better than time-series models at forecasting earnings. However, as discussed below, the economic magnitude of analysts' superiority appears to be small, suggesting that analysts' value to the capital markets likely rests on other roles than simply forecasting earnings.

Building on the research that compared analysts relative to time-series models, research considered refinements and extensions to research designs, with the goal of identifying factors that are correlated with incremental earnings forecast accuracy. These studies also appear in the lower left quadrant of figure 2, and are briefly highlighted below:

- O'Brien (1988): The most recent forecast more accurate than consensus.
- O'Brien (1990): There is no evidence of an analyst-level effect on forecast accuracy, thus no analysts are persistently better than others.
- Stickel (1990): Analysts ranked as an Institutional Investor All-Star are superior forecasters than a matched sample based on forecast recency.
- Brown (1991): The accuracy of the consensus forecast gets more accurate if older forecasts are dropped.
- Sinha, Brown, and Das (1997): Careful controls for forecast recency yield evidence that some analysts are more accurate than others
- Mikhail, Walther, and Willis (1997): Individual analyst experience increases forecast accuracy
- Clement (1999): Analysts' forecast accuracy is increasing in resources and decreasing in complexity.

Thus, the literature moved beyond concern over analysts being superior to time-series models, and began investigating whether some analysts were better than others. As with the previous efforts on analysts versus time-series models, this series of research initially showed no differences, but subsequently found the existence of differences.

Simultaneous to these two sets of studies, research was also considering the association of analysts' forecasting activities with stock prices. Some of the papers highlighted above also examined market reactions to forecasts and earnings surprises.

For example,

- Fried and Givoly (1982) and others: Earnings forecast accuracy generally corresponds to a greater association between unexpected earnings based on such forecasts and announcement period stock returns.
- O'Brien (1988): Even though Standard & Poors and I/B/E/S analysts exhibit higher forecast accuracy, they have no stronger association with stock returns than time series models.
- Philbrick and Ricks (1991): The actual definition of what income statement level earnings being forecasted varies across forecast data providers. Value Line forecast errors are the smallest, but various combinations of forecasts and actual earnings across the databases yields the strongest association with announcement period stock returns (e.g., unexpected earnings based on Value Line earnings forecasts and I/B/E/S actual earnings)

This focus on the correlation between analysts-based earnings surprises and stock prices prompted researchers to examine whether analysts' themselves appeared to be efficient with respect to information cues. Such studies tend to examine whether analyst forecast errors are correlated with publicly available information. If a correlation exists, research concludes that analysts are inefficient with respect to such information. This area of research arose around 1990 and continues to the present. Studies shown in the top right quadrant of figure 2 are highlighted below:

- De Bondt and Thaler (1990): Analysts overreact to past earnings changes, resulting in forecasts that are overoptimistic.
- Lys and Sohn (1990) and Abarbanell (1991): Analysts' forecasts underreact to information in prior stock price changes.
- Mendenhall (1991) and Abarbanell and Bernard (1992): Analysts underestimate the serial correlation in quarterly earnings (i.e., post-earnings announcement drift), but to a lesser extent than investors do through stock prices.
- Elliott, Philbrick, and Wiedman (1995): Analysts systematically underreact to their own sequential prior forecast revisions.
- Easterwood and Nutt (1999): Analysts underreact to negative information and overreact to positive information, both reactions leading to analysts being persistently overoptimistic.
- Bradshaw, Richardson, and Sloan (2001): Analysts underreact to predictable earnings patterns following extreme accruals.

As can be seen from the highlights, there does not appear to be a general consensus on whether analysts over- or underreact to information. Either way, the conclusions that are inevitably that analysts are 'inefficient' with respect to numerous pieces of information. This literature is vast, with almost any information cue one can consider having been subjected to an analyst forecast analysis. In the next section, I argue that drawing conclusions about the efficiency of analysts' forecasts based on correlations may not be a strong test of analysts' processing of information.

A second wave of research on the efficiency of analysts attempts to understand whether analysts are internally efficient with respect to their own information outputs. For example, given the correspondence between earnings expectations and value, do analysts efficiently use their own earnings forecasts in valuing companies and generating stock recommendations? Select papers include:

- Bradshaw (2004): Analysts' recommendations are consistent with the use of heuristic valuations incorporating their own earnings forecasts.

- Asquith, Mikhail, and Au (2005): Qualitative information in analysts' reports explains a significant amount of their recommendations, target prices, and the price reaction to these forecasts.
- Loh and Mian (2006): More accurate forecasts lead to more profitable stock recommendations.

This research is noteworthy in that it necessarily considers simultaneously more outputs from the analyst than just the earnings forecasts. As argued in the next section, the literature on analysts suffers from an overemphasis on earnings forecasts relative to other important tasks performed by analysts. In this spirit, many of what some consider to be the most interesting papers on analysts focus on their activities within the context of what their individual and employer-level incentives are. A sampling of these types of papers is as follows:

- Francis and Philbrick (1993): Analysts trade off earnings forecast accuracy for intentional optimism to curry favor with managers.
- McNichols and O'Brien (1997): Analysts' exhibit a self-selection bias such that negative views are censored, and hence unobservable to investors or researchers.
- Lin and McNichols (1998): Analysts exhibit overoptimism when their employers perform investment banking services for covered firms.
- Michaely and Womack (1999): After the quiet period following an initial public offering, affiliated analysts are more likely to issue buy recommendations than are unaffiliated analysts.
- Mikhail, Walther, and Willis (1999): Forecast accuracy is negatively related to analyst job turnover.
- Hong and Kubik (2003): Promotions and demotions at investment banks depend more on optimism than accuracy.
- Gu and Wu (2003) and Basu and Markov (2004): These papers question analysts' loss functions implied by prior work that uses ordinary least squares models to link forecast errors and various measures (implying a quadratic loss function) by proposing that analysts' might prefer to minimize the absolute error instead.
- Raedy, Shane, and Yang (2006): Evidence of analyst underreaction might not be due to them ignoring publicly available information, but due to their asymmetric loss function whereby they incur greater reputation cost

of forecast errors when the error has the opposite sign as the analysts' prior earnings forecast revision. (i.e., bad to 'overshoot').

Left out of the terse listing of papers in figure 2 are many important studies on (i) the analyst coverage decision, (ii) dispersion and its association with prices and accuracy, (iii) recent changes in the regulatory environment (FD), and (iv) experimental research that has a bearing on decision processes (but I'll defer discussion of these until later). I have also focused the studies listed here on those involving earnings forecasts, which is consistent with the representativeness of earnings forecasts as the focus of most studies in this literature. It is only recently that researchers have begun investigating recommendations (Womack 1996), growth projections (LaPorta 1996), and target prices (Brav and Lehavy 2003).

The overall takeaways from the above discussion is that approximately four decades of research on analysts focuses heavily on the earnings forecasting task, with only recently increasing interest in other activities performed by analysts. Second, the literature moves relatively carefully, with the conclusion that analysts dominate time-series models taking two decades. Third, beginning in the 1990s, much work has been positioned as attempts to understand what information analysts use and how they use it (i.e., the black box). Finally, as research studies have begun to consider activities beyond basic earnings forecasting, it has become necessary (and interesting) to examine analysts' incentives and investigate what role they might play in the empirical regularities developed over the past several decades of research (e.g., optimism). The next section provides ten specific observations that may guide future thought on how to interpret and advance the evidence on analysts' and their roles in the capital markets.

SPECIFIC OBSERVATIONS ON WHAT WE KNOW (OR THINK WE KNOW)

1. Analysts' Forecasts are Optimistic

Of all the regularities regarding sell-side analysts, the understanding that analysts' forecasts are routinely optimistic is the most pervasive. Numerous studies document that analysts' forecasts of earnings end up, on average, being too high. The problem is that this is a sweeping generalization that is not *on average* descriptive. There are at least three qualifications to the generalization that analysts are routinely optimistic. First, what specific forecasts are believed to be optimistic – quarterly earnings per share forecasts, annual earnings per share forecasts, growth forecasts, target prices, sales forecasts, cash forecasts, etc.? The typical explanation for why analysts would be persistently optimistic is that they wish to maintain cordial relationships with management, and optimistic forecasts further this goal. However, with regards to the most prevalent forecast made by analysts, earnings per share, it is difficult to understand why the managers analysts are presumably trying to please would prefer optimistic earnings forecasts. Research makes it clear that forecast errors (measured as actual earnings minus the forecast) are positively correlated with stock price reactions. Thus, forecasts that are too high (i.e., optimistic) create negative forecast errors and negative stock price reactions. On average, managers would seem to desire avoiding such reactions. Indeed, recent evidence in the accounting literature examines the 'meet or beat' phenomenon, which describes the preference by managers and tendency for quarterly earnings announcements to equal or slightly exceed

analysts' forecasts. Overall, it appears that at least for short-term forecasts, it is not descriptive to generalize that analysts' forecasts are optimistic.

Second, we seem to be well aware of selection biases in analyst forecast data which form the basis of most of our research. Several studies indicate that analysts seem to follow the old adage, 'if you don't have anything good to say, don't say anything at all.' For example, analysts are reluctant to issue negative recommendations (i.e., 'sell'), and more important, having issued favorable recommendations, they exhibit a reluctance or sluggishness in downgrading recommendations. Even though this is a well-known phenomenon, we apparently disregard knowledge of this selection bias in drawing generalities about the overall level of analyst optimism. In other words, what is interpreted as persistent optimistic bias by analysts could simply reflect the fact that we do not get to observe analysts' pessimistic views. With the recent implementation of NASD 2711 and NYSE 472 rules that, among other things, require analyst research reports to provide benchmark distributions of the brokerage's recommendations and target prices, we may witness an increasing tendency for analysts to convey previously non-communicated pessimistic views.

Finally, a recent body of research on 'street' or 'pro forma' earnings has revealed issues with analyst forecast data that systematically result in optimistically biased forecasts. Firm managers have always highlighted earnings in earnings releases that exclude the effect of various one-time charges. However, this practice escalated beginning in the 1990s, and firms began reporting earnings excluding an even greater number of income statement line items, including, for example, research and development expense, advertising expense, customer acquisition costs, and so on. As

these examples suggest, the types of income statement amounts excluded were disproportionately expenses (rather than gains or revenues). Both Bradshaw and Sloan (2002) and Abarbanell and Lehavy (2007) note that forecast data providers such as First Call and I/B/E/S claim to archive actual earnings figures that match the earnings definition being forecasted by the majority of analysts. This is important because the standard practice to calculate analyst forecast error (and hence bias) is to subtract the actual earnings figure from the forecast database from the forecast. Thus, if analysts forecast earnings before the effects of one-time items and research and development expense, then the forecast data providers include the actual earnings before one-time items and research and development expense in the historical database used by academics. Evidence presented in both papers referenced above indicate that the forecast data providers seem to have only gradually adjusted the actual earnings figures on the database to correspond to figures being forecasted by analysts. Both papers identify 1992 as representing a marked shift in the correspondence of actual and forecasted earnings. As much of the research supporting the inference that analysts are persistently optimistic was published using pre-1992 data, the non-correspondence between the actual earnings used in those studies (i.e., bottom-line 'net income' from Compustat or one of the forecast data providers) would have systematically resulted in mechanically upwardly biased forecast errors.

2. Analysts' Forecasts Are Superior to Time-Series Model Forecasts

The second presumably well-known feature of analysts' forecasts is that they are superior to forecasts from time-series models. Accounting research aimed at modeling

earnings using ARIMA models was at its peak during the 1970's and seems to have effectively ended in the mid-1980's. Brown (1993) provides a comprehensive review of much of this literature, which is also briefly summarized by Kothari (2001), who states at the outset (p. 145), "I deliberately keep my remarks on the earnings' time-series properties short because I believe this literature is fast becoming extinct. ... [due to] easy availability of a better substitute: analysts' forecasts...."

On one hand, if analysts are efficient in any sense, as has been noted before by Brown et al. (1987), it has to be the case that analysts' forecasts outperform time-series model forecasts, because analysts have both a timing and information advantage. Analysts can easily calculate any anointed time-series model and incorporate that information into their overall information set. Moreover, because time-series models are parsimonious, the information available to analysts is greater than that which can be quantified by any time-series model. Thus, for most forecast dates, an analyst will have an information advantage over a time-series model, which necessarily relies on historical inputs. Nevertheless, it took scores of papers spanning two decades (i.e., approximately 1968-1987) for academic research to conclude that analysts' are superior to time-series models.

Many of the papers that concluded examined the relative forecasting ability of analysts versus time-series models were based on limited samples. For example, Barefield and Comiskey (1975) examine forecasts for 100 firms (and conclude that analysts outperformed a simple random walk forecast) and Brown and Rozeff (1978) examine forecasts for 50 firms (and conclude that most time-series models are outperformed by analysts, particularly at longer horizons). Fried and Givoly (1982) is

generally credited as one of the decisive studies in this area, primarily due to the significantly expanded sample size. They examine 100 forecasts per year for the period 1969-1979 and conclude that analysts were superior to time-series models. However, what seems to have been overshadowed in subsequent research that wholly abandoned time-series models is the slim margin by which analysts won this contest. For example, Fried and Givoly calculate absolute forecast errors scaled by actual earnings per share. Their primary results indicate an average absolute forecast error for analysts of 16% relative to a comparable forecast error for two time-series models of 19% and 20%, respectively. Furthermore, results for individual years are often closer than this 3-4% spread. This seems to be a slim margin of victory for analysts given the information and timing advantages they have over the time-series models. The increasing tendency for managers to provide earnings guidance (Matsumoto 2002) and earnings preannouncements (Soffer, Thiagarajan, and Walther 2000) should have increased analysts' superiority over time-series models, but no research of which I am aware has examined this.

If one restricts their consumption of research to accounting journals, then it would appear that research using time-series models is indeed extinct.¹ However, outside of the accounting literature, continued use of time-series forecasts as an alternative and as a benchmark for expert forecasts is prevalent. Indeed, the economics literature largely concludes that time-series forecasts are superior to those of various experts. For example, this is argued to be the case for forecasts of interest rates (Belongia 1987), gross domestic product (Loungani 2000), recessions (Fintzen and Stekler 1999), and business

¹ This is not meant to dispute the conclusion in Kothari (2001) referenced above, which is indeed accurate.

cycles (Zarnowitz 1991). This discrepancy in conclusions across research paradigms is surely related to the unit of analysis. Forecasts of earnings is done frequently with the input of the preparers of the earnings being forecasted, accounting procedures for those earnings are well-understood, and such accounting standards often have the objective of smoothing reported earnings (e.g., pension assumptions). In contrast, items like interest rates, GDP, recessions, and business cycles are not generally subject to the control of an individual manager or follow a prescribed set of rule governing their reporting.

3. Analysts' Forecasts are Inefficient

A large number of research papers spanning the late 1980s through the present examine whether analysts' forecasts are 'efficient.' Similar to how efficient market prices are defined, forecasts are said to be efficient if they incorporate all information available to the analyst. Thus, studies have examined whether analysts incorporate information in past earnings, past market prices, and past forecast revisions; similarly, more recent studies examine whether analysts' forecasts are efficient with respect to information in financial statement information like accruals, management forecasts, and various other financial disclosures.

These studies inevitably draw conclusions about the efficiency of analysts' forecasts. If forecast errors are correlated with some information available *ex ante* to the analyst, the forecast is said to be inefficient with respect to that information. In these cases, the analyst is said to have either 'underreacted' or 'overreacted' to the information. As it turns out, it is rare to witness empirical results which support an efficient use of information. The likely reason is that the data we rely upon is noisy, which inevitably

leads to coefficients in empirical tests that are consistent with inefficient use of information.

To clarify this, consider a simple correlation between some analyst variable AV (e.g., annual forecast revision) and some variable of interest X (e.g., information in a quarterly earnings announcement). What the researcher wants to measure is $\text{corr}(AV, X)$. However, X is likely measured with error, so the researcher ends up measuring $X + \text{error}$, rather than X. In the typical regression framework, the researcher would estimate the following regression:

$$AV = \alpha + \beta(X + \text{error}) + e,$$

leading to the well-known downward bias in the estimate of β (absent other covariates). This downward bias inevitably leads researchers to conclude that, with respect to the information in the phenomenon measured by X, analysts appear to be inefficient. The often overlooked or unstated alternative is that the tyranny of measurement error contaminates our ability to draw strong conclusions regarding analysts' efficiency in processing particular pieces of information.²

4. Most Academic Research Ignores Analysts' Multi-Tasking

Of the hundreds of papers published on sell-side analysts, casual empiricism supports the conclusion that most focus exclusively on the earnings forecasting process. Thus, if someone unfamiliar with sell-side analysts went to the accounting and finance

² Of course, if the left hand side were some analyst variable, like forecast error, measurement error would tend to bias this simple univariate specification towards a conclusion of efficiency rather than inefficiency. The variety of empirical specifications in the literature and the multivariate (rather than simple univariate) nature of such specifications leads to ambiguous directional predictions regarding measurement error induced bias, but it is reasonable to presume that conclusions that generally fall between full efficient use of information by analysts and complete inefficiency are most likely.

literature to understand what it is they do, they would likely come away with the impression that analysts' primary goal is to issue accurate earnings per share forecasts.

In contrast, consideration of all the roles performed by an analyst suggests that earnings per share forecasts are either tangential or at best just one of many inputs into the analysts' other (primary) activities. Thus, a focus on earnings forecasts by academics is useful to understanding what analysts do, but it is a means not an end. Schipper (1991) noted early on in this literature that, "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* ... [emphasis added] (p. 112). Similarly, Zmijewski (1993) argued shortly thereafter that one of the primary areas of research that could further our knowledge are studies that lead to "expansion of our analysis of financial analysts' earnings forecasts to encompass more of what they actually do [emphasis added] (p. 338).

The easiest means of understanding what analysts do is to examine other outputs provided by them. In recent years, research into these other outputs has been growing, with studies on stock recommendations (e.g., Womack 1996), growth projections (e.g., Dechow and Sloan 1997), target prices (e.g., Brav and Lehavy 2003), and risk ratings (Lui, Markov, and Tamayo 2007). A second step is to simultaneously examine these outputs. In other words, if one of analysts' primary objectives is to issue an investment recommendation for a security, then one might examine how earnings forecasts and growth projections are associated with the actual recommendation (e.g., Bradshaw 2004). To gather a quick feel for how active research is along these suggestions, I performed a

global search of scholarly articles on ABI/INFORM using various keywords, and found the following:

analyst+earnings	867 articles
analyst+recommendation	149 articles
analyst+long+term+growth	54 articles
analyst+target+price	14 articles
analyst+earnings+recommendation	27 articles
analyst+earnings+long+term+growth	22 articles
analyst+earnings+target+price	3 articles
analyst+earnings+recommendation+long+term+growth	1 article

This is not to suggest that research studies that incorporate more than one analyst variable are superior, but rather, that furthering our understanding of what analysts do and why they do it requires consideration of their portfolio of activities. For example, Loh and Mian (2006) examine whether analysts who provide superior earnings forecasts also provide more profitable stock recommendations, which is a useful question to answer as it pertains directly to the use of earnings forecasts as an input into the arguably more important role of providing investment advice.

Clearly, as discussed above, the overwhelming bulk of research effort appears to focus on earnings forecasts, with some distant level of interest on analysts' stock recommendations. However, beyond that the interest level suggested by the above ABI/INFORM search seems to drop substantially. The simple explanation may simply be that data on these other metrics have not been widely available until recently. For example, whereas large samples of machine-readable earnings forecast data have been available since the early 1970s, data for long-term growth forecasts became available in 1981, for recommendations in 1992, and for target prices in 1996. I return to this theme later when I comment on research that is aimed at understanding what analysts' do with their own earnings forecasts.

5. Analysts are Dominated by Conflicts of Interest

Besides the first point raised regarding the belief that analysts' forecasts are persistently overoptimistic, perhaps the second most prevalent belief is that analysts' behavior is dominated by conflicts of interest. There are at least six sources of conflicts that have been discussed either in the literature or the financial press and that are purported to lead to analysts being overoptimistic. The following briefly lists, in my assessment, the sources of conflict in descending order of the relative emphasis given to them in the literature.

1. Investment banking fees. Managers periodically require access to the capital markets and require the assistance of investment banking professionals, who are frequently employed by firms that also run sell-side research shops. It has long been argued, and recent anecdotal evidence is consistent with the charge, that sell-side research departments are rewarded by the investment banking side of operations for providing favorable coverage of deals that the firm underwrites. Such fees are the fuel of such firms, and typical large placements bring in millions of dollars in fees. Accordingly, sell-side research, which is generally a cost rather than a profit center, is argued to be predisposed towards overoptimism due to the lure of lucrative investment banking fees. This explanation is the most prevalent.
2. Currying favor with management. Distinct from the incentive to appease managers to obtain investment banking business, sell-side analysts have also been accused of being optimistic so that they maintain access to firm managers who are a primary source of information flow (Francis and Philbrick 1993). The recently implemented Regulation FD is meant to curb this practice, and requires that managers refrain from selectively releasing private information. Several studies have attempted to examine whether the implementation of this regulation led to less optimistic forecasts and recommendations by analysts. However, around the same time that Regulation FD was implemented, there were other regulations and market sentiment changes that make it difficult to attribute any observed change in overall analyst optimism to this single piece of regulation (e.g., NYSE 472, Nasdaq 2711, Sarbanes-Oxley, large interest rate changes, severe currency

exchange changes, etc.). Even in the presence of regulation disallowing selective disclosure, there remain reasons for analysts to maintain cordial relations with managers (e.g., simply getting managers to return phone calls, receiving favorable queuing during conference calls, etc.).

3. Trade generation incentives. Another reason analysts are allegedly predisposed towards optimism is that their firms also receive compensation through handling investor trades. As the argument goes, it is easier to convince an investor to buy a stock that they do not own rather than convincing them to sell a stock they must already own. Consequently, to generate investor purchases, analysts will optimistically bias their reports. Recent evidence by Cowen et al. (2006) and Jacob et al. (2008) suggests that incentives for optimistic bias are stronger for trading than for investment banking. They partition investment banks into those that provide investment banking and those that do not, where trading fees are the primary source of revenues, and find that *ex post* optimistic bias is stronger for analysts working at the non-investment bank firms. Also, Jacob et al. (2008) provide some evidence that affiliated analysts are actually more accurate than unaffiliated analysts, and moreover, the differential forecast accuracy appears due to the employment of better analysts and the presence of greater resources.

4. Institutional investor relationships. The close ties between institutional investors and investment banks also provide sources of conflicts for sell-side analysts. As recipients of sell-side research, institutions may take positions in securities based on the information and recommendations conveyed in analysts' formal reports. If an analyst then downgraded a security that an institution had taken a position in, this would clearly be viewed unfavorably by the institution.

5. Research for hire. Given that approximately one-third of public companies have no analyst coverage and over half have at most two analysts, a recent phenomenon in equity research is for companies to pay for research to be conducted on their company. Several consortiums have been established, such as the National Research Exchange and the Independent Research Network. The conflicts of interest in these arrangements are obvious, and it remains to be seen how these will be managed.

6. Themselves. Finally, an often overlooked source of conflicts for analysts is the behavioral bias inherent in the analysis of securities. Similar to the well-documented home bias in the finance literature, the familiarity analysts develop with firms and their managers can lead analysts to develop close affinity to a firm.

This affinity may then result in analysts seeing the firm ‘through rose-colored glasses,’ and being incapable of downgrading or forecasting negative outcomes.

Of these six sources of analyst conflicts, the allegation that lucrative investment banking fees is the most cogent. Clearly, regardless of the reputation of a particular investment bank, any right-minded manager would steer clear of their services if sell-side analysts employed by that investment bank held negative views on the firm. Researchers have investigated such effects extensively, and it would appear that most researchers subscribe to the belief that these conflicts have strong effects on observed optimism in analysts’ reports. Numerous studies document significantly more optimistic forecasts and recommendations for affiliated analysts (e.g., Lin and McNichols 1998, Michaely and Womack 1999, Dechow, Hutton, and Sloan 2000, Lin, McNichols, and O’Brien (2005).

One explanation other than analysts’ deliberate optimism inspired by investment banking business is that among the distribution of investment banks, some will be the employers of analysts that are more optimistic about a particular firm, and it is the selection of those investment banks by the managers that explains the documented optimism by affiliated analysts. Research is unable to distinguish between these two explanations, but Ljungqvist, Marston and Wilhelm (2006) offer some evidence consistent with management choice. They examine investment banking deal flows and find no evidence that overoptimistic recommendations by analysts explain investment banking selection, the main determinant being the strength of prior investment banking relationships. Another explanation is that there is a collective level of heightened positive sentiment about firms that are in the growth stage and hence need external

financing. Consistent with this, Bradshaw, Richardson, and Sloan (2006) document that both affiliated and unaffiliated analysts display increasing optimism around periods of external financing and both groups show declines in the levels of optimism subsequent to external financing. This is not inconsistent with investment banking conflicts leading to optimism in research, but it does attenuate the degree of sinister interpretation given to the reports of analysts that are viewed as ‘affiliated.’ If analysts (as well as other market participants) tend to be optimistic about subsets of firms, it is not surprising that it would be the subset that is growing and seeking external financing.

However, it is instructive to review the economic significance of investment banking conflicts as documented in the literature. Lin and McNichols (1998) provide one of the most compelling studies to review because of the relatively large sample and well-executed matched sample design. They examine approximately 2,400 seasoned equity offerings (SEO) spanning 1989-1994. Primary results examine for significant differences in one-year ahead and two-year ahead earnings per share forecasts, growth projections, and stock recommendations. A summary of their results is as follows:

	One-year ahead EPS	Two-year ahead EPS	Earnings growth	Stock Recommendation
Unaffiliated	0.071	0.098	0.207	3.901
Affiliated	0.070	0.099	0.213	4.259
<i>Difference</i>	-0.001	0.001	0.006	0.358
Significant difference?	No	No	Yes	Yes

Note: EPS forecasts are scaled by price. Earnings growth projections reflect forecasts of annual percentage growth. Stock recommendations are coded on a 1 to 5 scale, with 1 being ‘strong sell’ and 5 being ‘strong buy’.

They find no differences in optimism in earnings forecasts, but they find analysts affiliated with SEOs provide higher growth projections and more positive

recommendations. However, the economic significance of the differences do not seem large. For annual earnings growth projections, the difference is less than one percent, and the difference in stock recommendations is approximately one-third of a change in ranking. Adherents to the paradigm arguing that investment banking biases analysts to be optimistic would highlight that the analysts that are unaffiliated are almost as optimistic as the affiliated analysts because they too were using research to court the managers for the investment banking business, which is in conflict to the evidence discussed earlier in papers like Jacob et al. (2006).

6. Limited Evidence Exists Regarding What Analysts Do with Their Own Forecasts

It is presumed that analysts are sophisticated and their analyses are internally consistent. However, very little research has examined their outputs in a multivariate setting. For example, research has examined analysts' forecasting abilities extensively, and there have been moderate efforts to understand their recommendation abilities. Clearly, recommendations should be linked in some manner to analysts' valuations, and we believe from many capital markets studies (i.e., Ball and Brown 1968, etc.) that earnings expectations are positively correlated with prices. Thus, rational behavior by analysts would mean that their own earnings forecasts are correlated with their valuations that provide the basis for their stock recommendations.

Francis and Philbrick (1993) provided the earliest systematic study of the interplay between analysts' various forecasts. Although their sample prevents an examination of how individual analysts use their own forecasts. Nevertheless, their study is one of the first to attempt to understand how analysts incorporate specific information

into their forecasts. They examined Value Line analysts, who issue earnings forecasts but include in their reports a ‘timeliness ranking’ of a stock, akin to an individual analyst’s stock recommendation but prepared by other analysts at Value Line. They hypothesized that analysts would attempt to curry favor with managers by diffusing unfavorable timeliness rankings by optimistic forecasts, and they conclude that Value Line analysts appear to behave in this manner.

Another early study that attempted to directly examine the within-analyst correlation of various outputs is Bandyopadhyay, Brown, and Richardson (1995), who examine analysts’ target prices and earnings forecasts. Based on the presumption that analysts use their own forecasts in deriving stock valuations, they hypothesize that both one-year ahead and two-year ahead earnings forecasts will be correlated with analysts target prices (i.e., valuations), and that the correlations will be stronger for longer horizon forecasts. Indeed, they document R^2 s of approximately 30% (60%) when correlating changes in target prices with changes in one-year ahead (two-year ahead) earnings forecasts. Similarly, Loh and Mian (2006) find that analysts with more accurate earnings forecasts provide more profitable stock recommendations, consistent with analysts using their own forecasts as inputs into their valuations and recommendations.

Recently, there seems to be a growing understanding of the benefits of understanding analysts’ use of information, and attempts to measure within-analyst correlations of data are becoming more common. For example, Bradshaw (2002) performed a content analysis and found that analysts’ valuations are almost always based on various earnings-multiple heuristics, and Bradshaw (2004) documented that researcher-generated recommendations based on simple residual income valuations using

analysts' earnings forecasts as inputs outperform the analysts' recommendations that are based on heuristics. Similarly, Barker (1999) and Asquith, Mikhail, and Au (2005) document a high degree of reliance by analysts on qualitative factors in communicating their analyses, supplementing their heuristic use of earnings forecasts to assess valuations of firms. Given increasing availability of line item forecasts other than earnings, there is also an increasing interest in the internal consistency of those measures as well. For example, Ertimur, Mayew, and Stubben (2008) examine the multiple-level forecast accuracy of analysts that provide disaggregated forecasts (i.e., sales and earnings).

The trend towards research that simultaneously considers multiple analyst outputs is a step in the right direction if our goal is to increase our knowledge of analysts using large sample databases. One of the common objectives of research on analysts is to provide evidence that allows us to peer inside the decision-making processes they follow. However, though there are benefits from the typical archival empirical approach, the methodology is necessarily limited in its ability to garner insights into how analysts make decisions. Alternatively, research methodologies that work with data other than the databases provided by I/B/E/S and other providers are likely to provide complementary approaches. The next two sections expand on these

7. We Think We Know *How* Analysts Forecast

As the literature on analysts has grown, researchers have moved beyond straightforward investigations of distributional properties of forecast errors and profitability of analysts' recommendations. The tenor of most studies is that the researchers are interested in *how* analysts perform their tasks. However, with few

exceptions, none provide direct evidence on *how* analysts go about generating forecasts or making stock recommendations. The problem appears to be a preference for archival research, which is subject to data and methodological constraints. Thus, researchers tend towards similar approaches and typically regress forecast errors on different independent variables to explain forecast errors. Some papers attempt to provide indirect evidence, but the nature of these analyses limits the strength of conclusions we can draw about analysts' actual decision processes.

The typical research design adopted when a researcher holds some hypothesis about how analysts use some information signal is to estimate a regression of analyst forecast error on the information variable,

$$\text{Forecast Error} = \alpha + \beta X + e,$$

where X is the variable of interest. As summarized in figure XX, right-hand side variables have included past earnings changes, past price changes, analysts' forecast errors, income statement line items, balance sheet line items, financial statement footnote information, management forecasts, macroeconomic variables, and so on. From these econometric analyses, conclusions are drawn as to whether the analyst incorporated the information captured by the variable X in their earnings forecast process.

Such a research design is a study of associations, not behavior. However, it has become prevalent to draw conclusions regarding analysts' behavior from these tests. Notwithstanding the fact that the combination of the research designs and the conclusions do not actually speak to analysts' behavior, these results do not map into the way that forecasting is covered in most financial statement analysis courses and textbooks. This suggests that either the research designs that are utilized in an attempt to see into the

forecasting process or the pedagogical approach to prospective analysis needs revision. At a minimum, it is important for researchers to be careful about drawing strong conclusions about analysts' behavior based only on data that can be quantified and used as inputs in a specification like that above.

One alternative is to continue the trend in simultaneously examining multiple analyst forecasts and other information, as discussed earlier. Though limited by the research design that relies on archival data, this approach allows extended insights into statistical associations. Combined with prior findings of associations between forecast errors and various information signals, multivariate analyses of analysts' outputs can address numerous interesting questions (e.g., does forecasting cash flows lead to more accurate forecasts, more profitable recommendations, and so on). The second alternative is to embrace alternative research methodologies, discussed next.

8. Empiricists Have Traditionally Not Embraced Alternative Methodologies (but This is Changing)

As noted above, the primary methodology employed in the analyst literature is the empirical analysis of archival data. With a few exceptions, only recently have other methodologies received more attention in the literature. A likely explanation for the disproportionate focus on analysis of archival data is that it is much less costly to download a panel of I/B/E/S data than it is to conduct an experiment or perform a content analysis of a distribution of analyst reports. This explanation mirrors the likely explanation for the disproportionate analysis of earnings forecast data relative to other analyst outputs for which data availability is lower, such as risk ratings and target prices.

An early paper by Larcker and Lessig (1983) is a good example of the limitation of statistical analysis of archival data. In this study, Larcker and Lessig perform an experiment with 31 subjects who were asked to make buy or no-buy decisions for 45 stocks. They were interested in the competing ability of linear modeling (i.e., regression analysis) and retroactive process tracing (i.e., ex post interviews of subjects) to accomplish two objectives: (i) predicting subjects buy and no-buy decision and (ii) identifying the relative importance of various information cues used by the subjects. These objectives continue to map very well into those of many analyst studies that employ archival data.

They found that both linear models and process tracing performed reasonably well at predicting the buy and no-buy decisions of the subjects. However, there were frequent differences between the two approaches in identifying relative cue importance to the subject's buy and no-buy decisions. These findings lead the authors to conclude that if the goal of a research study is the *prediction of a judgment decision*, then both approaches appear valid, and lower cost and complexity would favor linear modeling. However, if the goal of a research study is *to understand what information is used and how it is used*, a technique like retroactive process tracing seems necessary. This point cannot be emphasized enough, as it bears directly on the 'black box' in figure 1b.

The current shortcoming of the literature on sell-side analysts is our lack of understanding of what goes on inside the black box of what an analyst actually does. Fortunately, there is a growing use of alternative methodologies that complement research that uses linear models. Alternative approaches to understanding analysts' activities include surveys and interviews, experiments, rigorous content analysis

approaches, and focused analysis of representative firms). Clearly, alternatives to linear modeling also have weaknesses (i.e., surveys risk biased responses, experiments have difficulty replicating complex unstructured tasks, content analysis only has access to the final communication medium rather than the process itself, analyzing a single brokerage firm may have no external validity, etc.). For such reasons, these approaches are to be viewed as complementary. Together, consistent evidence across alternative methodologies increases validity of research conclusions and is necessary for this literature to progress.

The popularity of the recent survey of managers by Graham, Harvey, and Rajgopal (2005) is testament to the level of potential interest in the results of a survey of financial executives. Although there are a number of various surveys of financial analysts, most are relatively limited in scope or geography.³ A notable exception is a survey by Block (1999), who surveyed members of the Association for Investment Management and Research (AIMR). His survey was broadly focused and queried analysts on their uses of valuation models, importance of financial inputs, bases for recommendations, various opinions regarding market efficiency and dynamics. The most remarkable finding in his survey is that analysts overwhelmingly do not emphasize present value models to value firms. Additionally, he found that analysts do not pay much attention to dividend policy, they focus more on the long-term prospects than near-term quarterly results, and analysts believe that skilled portfolio managers can beat the market.

³ For example, surveys have focused on analysts' opinions of cash flow accounting (McEnroe 1996) and forecast revisions (Moyes, Saadouni, Simon, and Williams 2001), and have been conducted in various international markets including Saudi Arabia (Alrazeen 1999), Japan (Mande and Ortman 2002), Belgium (Orens and Lybaert 2007), and China (Hu, Lin, and Li 2008).

As noted above, surveys provide useful insights, but a weakness is the possibility that respondents do not truthfully report. However, as also noted above, if this survey evidence is combined with alternative research methodologies and the results consistently point towards the same conclusion, concerns over threats to validity can be minimized. As an example of how a conclusion can be compelling based on the collective results from studies using alternative methodologies, consider the conclusion in Block (1999) that analysts do not rely very much on present value models. This could be due to some form of non-response bias, a miscommunication of what was meant by present value techniques, or analysts' concerns that their approaches are proprietary and they bias their responses. However, subsequent studies that adopted content analysis (Bradshaw 2002) and linear modeling (Bradshaw 2004) provide uniformly consistent results that analysts indeed do not appear to make stock recommendations consistent with present value-based models.

Published surveys on analysts are relatively rare, as are content analyses and focused studies of individual brokerage firms. Moreover, those that are published appear to be concentrated outside of what are typically considered 'top-tier' journals. This is unfortunate, because other than my own personal interactions with analysts and users of analysts' information, where most of my knowledge of analysts has been obtained, I have learned a great deal from reading these studies. On an optimistic note, research utilizing experimental research methods is much more common and seems to be increasingly acceptable to top-tier journals. Many of these types of studies employ undergraduate or graduate students as subjects, but it is becoming increasingly common to see actual analysts serving as subjects. For example, Libby et al. (2008) employ a sample of 81

experience analysts and examine the tension between maintenance of relationships with firm managers and optimism and pessimism in earnings forecasts. Perhaps more interesting than the actual experimental results, the post-experiment subject interviews provide insights into how analysts are aware of the optimism-to-pessimism pattern in earnings across fiscal periods, but believe this pattern helps them receive preferential treatment in conference calls. Again, echoing the theme that multiple research designs can be combined to increase the validity of a research conclusion, the evidence in Libby et al. (2008) regarding analysts' desire to receive preferential or favorable treatment in conference calls (even in a post-Regulation FD environment) is also shown by Mayew (2008), who extracted data from conference call transcripts. His archival empirical study also confirms that analysts' with optimistic research on a company get more attention during conference calls. Together the Mayew and Libby et al. studies give increased comfort that analysts are indeed still concerned about currying favor with managers.

A final trend that is serving to make research on analysts more cohesive across methodologies is a growing prevalence of accounting academics properly trained in experimental research techniques. Moreover, this is accompanied by the gaining acceptance of 'behavioral finance' research, which is incorporating psychology research on decision making. The majority of experimental accounting research relies on similar theories (Koonce and Mercer 2005). Further, researchers appear to be realizing that certain methodologies are suited for specific research questions. For questions which arise around situations of decision-making and information processing, experiments seem useful because of their ability to minimize confounding 'real-world' variables and manipulate the variables of interest (Bloomfield, Libby, and Nelson 2002).

9. Academics May Be Focusing Too Much on the Least Important Activities

As has been noted, the vast majority of research on analysts is focused on their ability to forecast earnings. The early literature pitted analysts against time-series forecasts, then gravitated towards identifying superior analysts with more accurate earnings forecasts. Recently, researchers have been simultaneously considering the interplay among various analyst outputs (e.g., earnings and recommendations), but the anchor of the analysis remains earnings forecast accuracy. If an individual with no understanding of sell-side analysts were to attempt to understand what they do based on a reading of our academic literature, that person would surely conclude that one of the things most important to analysts is their earnings forecasts. I contend that this would be a gross mischaracterization of the analyst's job function, and hence his/her incentives. I believe such a view characterizes that of many academics, and as a result impedes our ability to further our understanding of sell-side analysts.

To provide some perspective on the importance of earnings forecasts, table 1 provides a panel of data reflecting traits of analysts ranked in order of importance by respondents to the annual Institutional Investor Ranking of analysts. This ranking is the first-order determinant of an analyst's compensation (Groysberg, Healy, and Maber 2008). Thus, if we assume that analysts wish to maximize their compensation, then providing institutional investors with what they need, as reflected in the rankings, will be descriptive of aspects of their job towards which they devote significant effort.

The data in table 1 span 1998-2005, and show that the number of criteria reported in the rankings each year range from a low of eight items in 1998 to fifteen during 2002-

2004. The rankings indicate that the most important trait valued by institutional investors is industry knowledge, which has been the number one trait for all years of the survey. Clearly, analysts' are valued for their ability to see individual companies within the context of the industry as a whole. Other traits appear relatively stable in their importance across recent years, with two exceptions – earnings forecast and stock selection. Whereas earnings forecasts were ranked fifth in importance in 1998, they are ranked last in the most recent year in table 1. Similarly, stock selection was ranked as high as second in 1998, but has fallen to second-to-last in the last year of table 1. As a statistical measure of whether these changes are meaningful, table 2 provides a simple test of whether the changes in the ranking are significant. The mean change in rank is calculated for the annual changes in ranking, where rankings are converted to a [0,1] interval.⁴ For both earnings forecast and stock selection traits, the average change in ranking across 1998-2005 is significantly negative, indicating that both measures have become less important to institutional investors, and presumably less important to analysts, relative to other characteristics. Of course, one explanation is that earnings forecasts and stock selection are viewed as necessary by institutional investors, and presumably by analysts as well, but that other aspects of their jobs are relatively more important. This is consistent with earnings forecasts and stock selection being important; however, as suggested above, it also is consistent with these aspects of an analyst's job being relatively unimportant when their roles are viewed in context.

⁴ Each ranking is converted to RANK' to span the interval [0,1] as

$$\text{RANK}' = (\text{NRANK} + 1) - \text{RANK} / \text{NRANK},$$

where NRANK is the number of characteristics listed in the annual ranking and RANK is the numerical rank of the characteristic. Characteristics ranked in other years but not on the ranking in any individual year are assigned RANK'=0.

I believe that part of our focus on earnings forecast accuracy is driven simply by the wide availability of data on analysts' earnings forecasts and actual earnings and a predilection of accounting academics towards the investigation of phenomena that can be quantified. Measuring the accuracy of an earnings per share forecast suits our comfort zone. Similarly, measuring recommendation profitability is also appealing, despite numerous alternative measurement criteria decisions (i.e., return accumulation period, raw or adjusted returns, etc.). What is a lot more difficult to measure is the measurement of important aspects of the analysts' job function such as industry knowledge, assessment of firm strategy or quality of management, accessibility, the tone of their contextual reports, and so on. Nevertheless, researchers in this area must be open to alternative methodologies and data if the literature on analysts is to proceed in a meaningful way.

10. Analyst Data are Indirectly Helpful to Other Work Examining the Functioning of Capital Markets

In contrast to other critical points raised above, the following point is a commendation of research on analysts. As noted above, research on analysts has become pervasive with the elevation of analysts to a status of interesting economic agent worthy of individual examination. Comments numbered one through nine focus on this aspect of analysts. There is another very useful role of research using analyst data, which is that these data can provide insights into questions that arise in other capital market studies. Specifically, the identification and examination of asset pricing anomalies is an active area of research in the finance and accounting literatures. In the typical study, researchers demonstrate that future stock returns are systematically associated with

information available *ex ante* (e.g., past earnings changes, past price changes, accounting accruals, insider trading, etc.). Such studies are always subject to the ‘bad model’ criticism, which argues that the correlation reflects an incomplete control for priced risk rather than a true asset pricing anomaly that can be costlessly arbitrated away.

Because of the difficulty of convincingly capturing priced risk (or priced risk factors), an alternative to addressing the bad model criticism is to use a research design that skirts the risk issue. Whereas capital market anomalies all pertain to how investors incorporate information into prices, and analysts’ roles include the incorporation of information into their research, it is frequently useful to examine documented anomalies in the context of analysts’ research. For example, as an extension of the seminal studies by Bernard and Thomas (1989, 1990) on the post-earnings announcement drift anomaly, Abarbanell and Bernard (1992) examine whether analysts incorporate the autocorrelation structure documented in the Bernard and Thomas papers into their forecasts. They find that similar to market prices, analysts underreact to prior earnings changes. Accordingly, critics that dismissed the post-earnings announcement drift anomaly as a mis-measurement of risk must also explain why the phenomenon shows up in a non-asset pricing setting. Similar analyses have been conducted with respect to the glamour anomaly (Frankel and Lee 1998), the January effect (Ackert and Athanassakos 2000), and the accruals anomaly (Bradshaw, Richardson, and Sloan 2001; Barth and Hutton 2004),

CONCLUSION

In summary, we have learned a lot about analysts and their role in capital markets. However, research has focused on a narrow set of analyst outputs to draw conclusions

regarding what analysts do and how they do it. Further, this research is largely limited to variables that can be quantified, there is limited but growing investigation of the co-determination of analysts' outputs, and there is a disproportionately large emphasis on what is likely a relatively unimportant activity – forecasting earnings. For this literature to progress, research that provides any kind of penetration of the 'black box' of how analysts actually process information should be encouraged, even if methods or approaches are imperfect.

This literature finds itself at an interesting juncture of time, with numerous recent shocks to the capital markets (e.g., Regulation FD, \$1.4 billion SEC/state regulator settlement against ten large investment banks, a new independent brokerage research requirement, disclosure requirements of NASD Rule 2711 and NYSE Rule 472, and a trend towards paying for analyst coverage). Thus, there are numerous opportunities for the literature to progress if researchers move beyond the current prevailing paradigm of performing univariate analyses of earnings forecasts. Zmijewski (1993) discussed a literature review by Brown (1993), and echoed similar sentiments to those offered here. In commenting on the state of the literature at that time, he stated, "That is not to say, however, that researching the 'same old' issues using the 'same old' methodologies will be informative.... It will, naturally, become more and more challenging to identify interesting questions and to design interesting and meaningful empirical tests."

REFERENCES

- Abarbanell, J. 1991. Do analysts' earnings forecasts incorporate information in prior stock price changes? *Journal of Accounting and Economics* 14 (2): 147-165.
- Abarbanell, J., and B. Bernard. 1992. Tests of analysts' overreaction/underreaction to earnings information as an explanation for anomalous stock price behavior. *The Journal of Finance* 47 (3): 1181-1207.
- Abarbanell, J., and R. Lehavy. 2007. Letting the 'Tail Wag the Dog": The debate over GAAP versus street earnings revisited. *Contemporary Accounting Research* 24 (3): 675-723.
- Abdolmohammadi, M., R. Simnett, J. Thibodeau, and A. Wright. 2006. Sell-Side analysts' reports and the current external reporting model. *Accounting Horizons* 20 (4): 375-389.
- Ackert, L., and G. Athanassakos. 2000. Institutional investors, analyst following and the January anomaly. *Journal of Business Finance and Accounting* 27 (3-4): 469-485.
- Alrazeen, M.H., 1999. "The Quality of Annual Financial Reports of Saudi Corporations: Users' Perceptions and Companies' Practices." Ph.D. Thesis, Cardiff University.
- Asquith, P., M. Mikhail, and A. Au. 2005. Information content of equity analyst reports. *Journal of Financial Economics* 75 (2): 245-282.
- Ball, R., and P. Brown. 1968. An empirical evaluation of accounting income numbers. *Journal of Accounting Research* 6 (2): 159-178.
- Bandyopadhyay, S., L. Brown, and G. Richardson. 1995. Analysts' use of earnings forecasts in predicting stock returns: Forecast horizon effects. *International Journal of Forecasting* 11 (3): 429-445.
- Barefield, R., and E. Comiskey. 1975. The accuracy of analysts' forecasts of earnings per share. *Journal of Business Research* 3: 241-251.
- Barker, R.. 1999. Survey and market-based evidence of industry-dependence in analysts' preferences between the dividend yield and price-earnings ratio valuation models." *Journal of Business Finance and Accounting* 26 (3-4): 393-418.
- Barth, M., and A. Hutton. 2004. Analyst earnings forecast revisions and the pricing of accruals. *Review of Accounting Studies* 9: 59-96.
- Basu, S., and S. Markov. 2004. Loss function assumptions in rational expectations tests on financial analysts' earnings forecasts. *Journal of Accounting and Economics* 38: 171-203.

- Belongia, M. 1987. Predicting interest rates: A comparison of professional and market-based forecasts. *Federal Reserve Bank of St. Louis Review* March: 9-15.
- Bernard, V., and J. Thomas. 1989. Post-earnings-announcement drift: delayed price response or risk premium? *Journal of Accounting Research* 27 (3): 1-36.
- Bernard, V., and J. Thomas. 1990. Evidence that stock prices do not fully reflect the implications of current earnings for future earnings. *Journal of Accounting and Economics* 13: 305-340.
- Block, S. B. 1999. A study of financial analysts: Practice and theory. *Financial Analysts Journal* 55 (4): 86-95.
- Bloomfield, R., R. Libby, and M. Nelson. 2002. Experimental research in financial accounting. *Accounting, Organizations and Society* 27 (8): 775-810.
- Bradshaw, M., S. Richardson, and R. Sloan. 2001. Do analysts and auditors use information in accruals? *Journal of Accounting Research* 39 (1): 45-74.
- Bradshaw, M. 2002. The use of target prices to justify sell-side analysts' stock recommendations. *Accounting Horizons* 16 (1): 27-41.
- Bradshaw, M., and R. Sloan. 2002. GAAP versus the street: An empirical assessment of two alternative definitions of earnings." *Journal of Accounting Research* 40 (1): 41-66.
- Bradshaw, M. 2004. How do analysts use their earnings forecasts in generating stock recommendations?" *The Accounting Review* 79 (1): 25-50.
- Bradshaw, M., S. Richardson, and R. Sloan. 2006. The relation between corporate financing activities, analysts' forecasts and stock returns. *Journal of Accounting & Economics* 42 (1-2): 53-85.
- Brav, A., and R. Lehavy. 2003. An empirical analysis of analysts' target prices: Short-term informativeness and long-term dynamics. *The Journal of Finance* 58 (5): 1933-1968.
- Brown, L., and M. Rozeff. 1978. The superiority of analyst forecasts as measures of expectations: Evidence from earnings. *The Journal of Finance* 33 (1): 1-16.
- Brown, L., P. Griffin, R. Hagerman, and M. Zmijewski. 1987. Security analyst superiority relative to univariate time-series models in forecasting quarterly earnings. *Journal of Accounting and Economics* 9: 61-87.
- Brown, L. 1991. Forecast selection when all forecasts are not equally recent. *International Journal of Forecasting* 7 (3): 349-356.

- Brown, L. 1993. Earnings forecasting research: Its implications for capital markets research.” *International Journal of Forecasting* 9: 295-320.
- Brown, L., ed. 2000. *I/B/E/S Research Bibliography: Sixth Edition*. I/B/E/S International Inc., New York, NY.
- Brown, P. 1993. Comments on ‘Earnings forecasting research: Its implications for capital markets research’. *International Journal of Forecasting* 9: 331-335.
- Chandra, G. 1974. A study of the consensus on disclosure among public accountants and securities analysts. *The Accounting Review* 49 (4): 733-742.
- Clement, M. 1999. Analyst forecast accuracy: Do ability, resources and portfolio complexity matter? *Journal of Accounting and Economics* 27 (3): 285-303.
- Cowen, A., B. Groyberg, and P. Healy. 2006. Which types of analyst firms are more optimistic? *Journal of Accounting and Economics* 41 (1-2): 119-146.
- Cragg, J., and B. Malkiel. 1968. The consensus and accuracy of some predictions of the growth of corporate earnings. *The Journal of Finance* 23 (1): 67-84.
- De Bondt, W., and R. Thaler. 1990. Do security analysts overreact? *The American Economic Review* 80 (2): 52-57.
- Dechow, P., and R. Sloan. 1997. Returns to contrarian investment strategies: Tests of naïve expectations hypotheses. *Journal of Financial Economics* 43 (1): 3-27.
- Dechow, P., A. Hutton, and R. Sloan. 2000. The relation between analysts’ forecasts of long-term earnings growth and stock price performance following equity offerings. *Contemporary Accounting Research* 17 (1): 1-32.
- Dunn, K., and S. Nathan, 2005. “Analyst Industry Diversification and Earnings Forecast Accuracy.” *Journal of Investing* 14, 7-14.
- Easterwood, J., and S. Nutt. 1999. Inefficiency in analysts' earnings forecasts: Systematic misreaction or systematic optimism? *The Journal of Finance* 54 (5): 1777-1797.
- Elliot, J., D. Philbrick, and C. Wiedman. 1995. Evidence from archival data on the relation between security analysts' forecast errors and prior forecast revisions. *Contemporary Accounting Research* 11 (2): 919-938.
- Elton, E., and M. Gruber. 1972. Earnings estimates and the accuracy of expectational data. *Management Science* 18 (8): 409-424.
- Epstein, M., and K. Palepu. 1999. What financial analysts want. *Strategic Finance* 80 (10): 48-52.

- Ertimur, Y., W.J. Mayew, and S.R. Stubben. 2008. Analyst reputation and the issuance of disaggregated earnings forecasts to I/B/E/S. Working paper, Duke University and University of North Carolina.
- Fintzen, D., and H.O. Stekler. 1999. Why did forecasters fail to predict the 1990 recession? *International Journal of Forecasting* 15: 309-323.
- Francis, J., and D. Philbrick. 1993. Analysts' decisions as products of a multi-task environment. *Journal of Accounting Research* 31 (2): 216-230.
- Frankel, R., and C. Lee. 1998. Accounting valuation, market expectation, and cross-sectional stock returns. *Journal of Accounting and Economics* 25 (3): 283-319.
- Fried, D., and D. Givoly. 1982. Financial analysts' forecasts of earnings: a better surrogate for market expectations. *Journal of Accounting and Economics* 4 (2): 85-107.
- Frishkoff, P., P. Frishkoff, and M. Bouwman. 1984. Use of accounting data in screening by financial analysts. *Journal of Accounting, Auditing, and Finance* 8 (1): 44-53.
- Givoly, D., and J. Lakonishok. 1984. Properties of analysts' forecasts of earnings: A review and analysis of the research. *Journal of Accounting Literature* 3: 117-152.
- Graham, J., C. Harvey, and S. Rajgopal. 2005. The economic implications of corporate financial reporting. *Journal of Accounting and Economics* 40 (1-3): 3-73.
- Groysberg, B., P. Healy, and D. Maber. 2008. What drives financial analyst compensation? Working Paper, Harvard Business School.
- Gu, Z., and J. Wu. 2003. Earnings skewness and analyst forecast bias. *Journal of Accounting and Economics* 35 (1): 5-29.
- Hirst, D., and P. Hopkins. 1998. Comprehensive income reporting and analysts' valuation judgments. *Journal of Accounting Research* 36: 47-75.
- Hong, H., and J. Kubik. 2003. Analyzing the analysts: Career concerns and biased earnings forecasts. *The Journal of Finance* 58 (1): 313-351.
- Hu, Y., T.W. Lin, and S. Li. 2008. An examination of factors affecting Chinese financial analysts' information comprehension, analyzing ability, and job quality. *Review of Quantitative Finance and Accounting* 30 (4): 397-417.
- Jacob, J., S. Rock, and D.P. Weber, 2008. Do non-investment bank analysts make better earnings forecasts? *Journal of Accounting, Auditing and Finance*, Winter, Vol. 23 Iss. 1, 23-61.
- Koonce, L., and M. Mercer. 2005. Using psychology theories in archival financial accounting research. *Journal of Accounting Literature* 24: 175-214.

- Kothari, S.P. 2001. Capital markets research in accounting. *Journal of Accounting and Economics* 31: 105-231.
- La Porta, R. 1996. Expectations and the cross-section of stock returns. *The Journal of Finance* 51 (5): 1715-1742.
- Larcker, D.F., and V.P. Lessig. 1983. An examination of the linear and retrospective process tracing approaches to judgment modeling. *The Accounting Review* 58 (1): 58-77.
- Li, F. 2006. Annual report readability, current earnings, and earnings persistence. Working paper, University of Michigan.
- Libby, R., J. Hunton, H. Tan, and N. Seybert. 2008. Relationship incentives and the optimistic/pessimistic pattern in analysts' forecasts." *Journal of Accounting Research* 46 (1): 173-198.
- Lin, H., and M. McNichols. 1998. Underwriting relationships, analysts' earnings forecasts and investment recommendations. *Journal of Accounting and Economics* 25: 101-127.
- Lin, H., M. McNichols, and P. O'Brien. 2005. Analyst impartiality and investment banking relationships. *Journal of Accounting Research* 43 (4): 623-650.
- Ljungqvist, A., F. Marston, and W.J. Wilhelm Jr. 2006. Competing for securities underwriting mandates: Banking relationships and analyst recommendations. *Journal of Finance*, Vol. 61, Iss. 1, 301-340.
- Loh, R., and G. Mian. 2006. Do accurate earnings forecasts facilitate superior investment recommendations? *Journal of Financial Economics* 80 (2): 455-483.
- Loungani, P. 2000. How accurate are private sector forecasts? Cross-country evidence from consensus forecasts of output growth. IMF Working Paper No. 00/77, April.
- Lui, D., S. Markov, and A. Tamayo. 2007. What makes a stock risky? Evidence from sell-side analysts' risk ratings. *Journal of Accounting Research* 45 (3):629-665.
- Lys, T., and S. Sohn. 1990. The association between revisions of financial analysts' earnings forecasts and security-price changes. *Journal of Accounting and Economics* 13 (4): 341-363.
- Mande, V., and R. Ortman. 2002. Are recent segment disclosures of Japanese firms useful? Views of Japanese financial analysts. *The International Journal of Accounting* 37 (1): 27-46.
- Matsumoto, D. 2002. Management's incentives to avoid negative earnings surprises. *The Accounting Review* 77 (3): 483-514.

- Mayew, W. 2008. Evidence of management discrimination among analysts during earnings conference calls. *Journal of Accounting Research*, Forthcoming,
- McEnroe, J.E. 1996. An examination of attitudes involving cash flow accounting: Implications for the content of cash flow statements. *The International Journal of Accounting* 31 (2): 161-174.
- McNichols, M., and P.O'Brien. 1997. Self-selection and analyst coverage. *Journal of Accounting Research* 35 (Supplement): 167-199.
- Mendenhall, R. 1991. Evidence on the possible underweighting of earnings-related information. *Journal of Accounting Research* 29 (1): 170-179.
- Michaely, R., and K. Womack. 1999. Conflict of interest and the credibility of underwriter analyst recommendations. *The Review of Financial Studies* 12 (4): 653-686.
- Mikhail, M., B. Walther, and R. Willis. 1997. Do security analysts improve their performance with experience? *Journal of Accounting Research* 35: 131-157.
- Mikhail, M., B. Walther, and R. Willis. 1999. Does forecast accuracy matter to security analysts? *The Accounting Review* 74: 185-200.
- Moyes, G., B. Saadouni, J. Simon, and P. Williams. 2001. A comparison of factors affecting UK and US analyst forecast revisions. *The International Journal of Accounting* 36 (1): 47-63.
- Nichols, C., and J. Whalen. 2004. How do earnings numbers relate to stock returns? A review of classic accounting research with updated evidence. *Accounting Horizons* 18 (4): 263-286.
- O'Brien, P. 1988. Analysts' forecasts as earnings expectations. *Journal of Accounting and Economics* 10: 53-83.
- O'Brien, P. 1990. Forecast accuracy of individual analysts in nine industries. *Journal of Accounting Research* 28 (2): 286-304.
- O'Hanlon, J. 1993. Commentary on: Lawrence D. Brown 'Earnings forecasting research: Its implications for capital markets research. *International Journal of Forecasting* 9: 321-323.
- Orens, R., and N. Lybaert. 2007. Does the financial analysts' usage of non-financial information influence the analysts' forecast accuracy? Some evidence from the Belgian sell-side financial analyst. *The International Journal of Accounting* 42 (3): 237-271.
- Philbrick, D., and W. Ricks. 1991. Using Value Line and IBES analyst forecasts in accounting research. *Journal of Accounting Research* 29 (2): 397-417.

- Raedy, J., P. Shane, and S. Yang. 2006. Horizon-dependent underreaction in financial analysts' earnings forecasts. *Contemporary Accounting Research* 23 (1): 291-322.
- Ramnath, S., S. Rock, and P. Shane. 2008. The Financial analyst forecasting literature: A taxonomy with suggestions for further research. *International Journal of Forecasting*, 24 (1): 34-75.
- Schipper, K. 1991. Commentary on analysts' forecasts. *Accounting Horizons* 5 (4): 105-121.
- Sinha, P., L. Brown, and S. Das. 1997. A re-examination of financial analysts' differential earnings forecast accuracy. *Contemporary Accounting Research* 14 (1): 1-42.
- Soffer, L., S. Thiagarajan, and B. Walther. 2000. Earnings preannouncement strategies. *Review of Accounting Studies* 5 (1): 5-26.
- Stickel, S. 1990. Predicting individual analyst earnings forecasts. *Journal of Accounting Research* 28 (2): 409-417.
- Tevelow, R. 1971. How a security analyst uses the annual report. *Financial Executive* 39 (11): 18-21.
- Thomas, J. 1993. Comments on 'Earnings forecasting research: Its implications for capital markets research' by L. Brown. *International Journal of Forecasting* 9: 325-330.
- Womack, K. 1996. Do brokerage analysts' recommendations have investment value?" *The Journal of Finance* 51 (1): 137-167.
- Zarnowitz, V. 1991. Has macro-forecasting failed? *The Cato Journal* 12 (1): 129-164.
- Zmijewski, M. 1993. Comments on 'Earnings forecasting research: Its implications for capital markets research' by L. Brown." *International Journal of Forecasting* 9: 337-342.

Figure 1a – Analyst Decision Process Schematic

Panel A: Decision process schematic

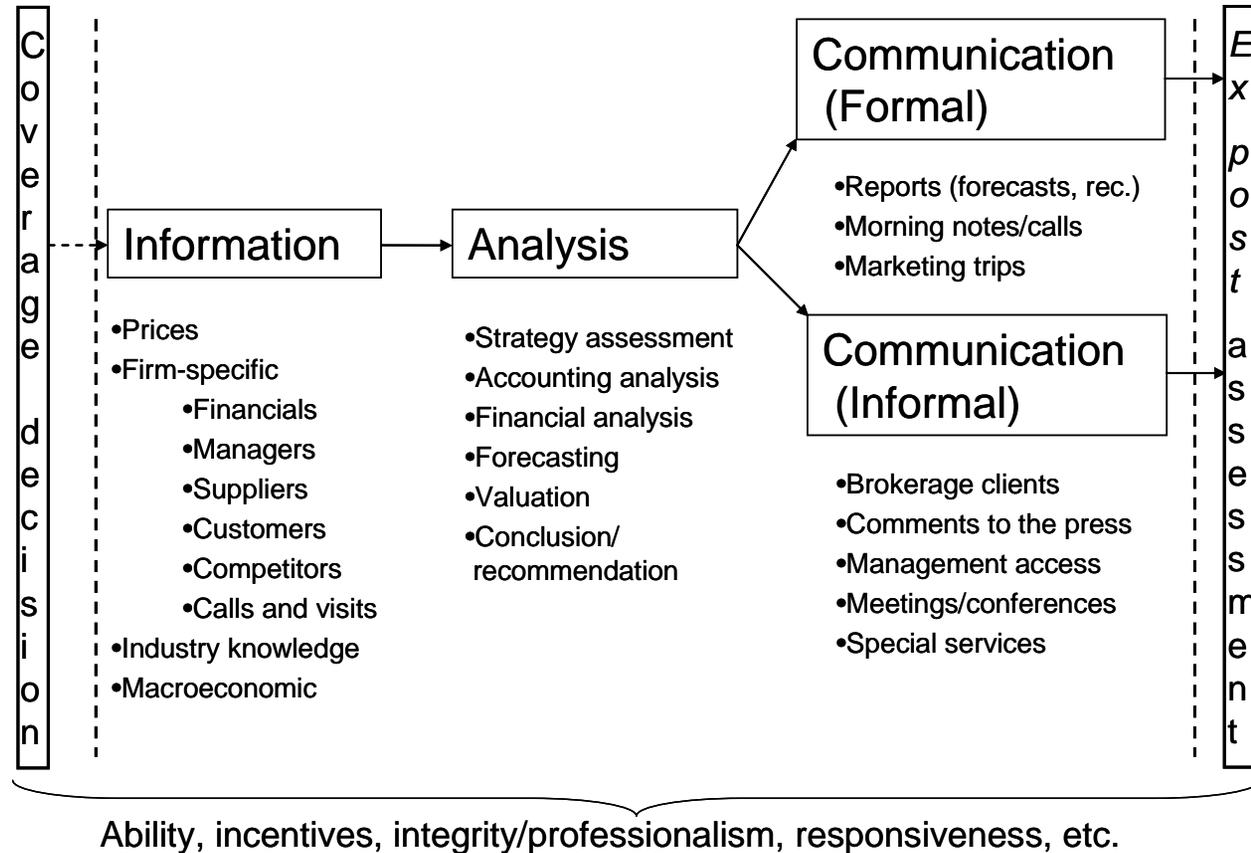


Figure 1b – Analyst Decision Process Schematic (cont.)

Panel A: Decision process schematic with most common research designs indicated

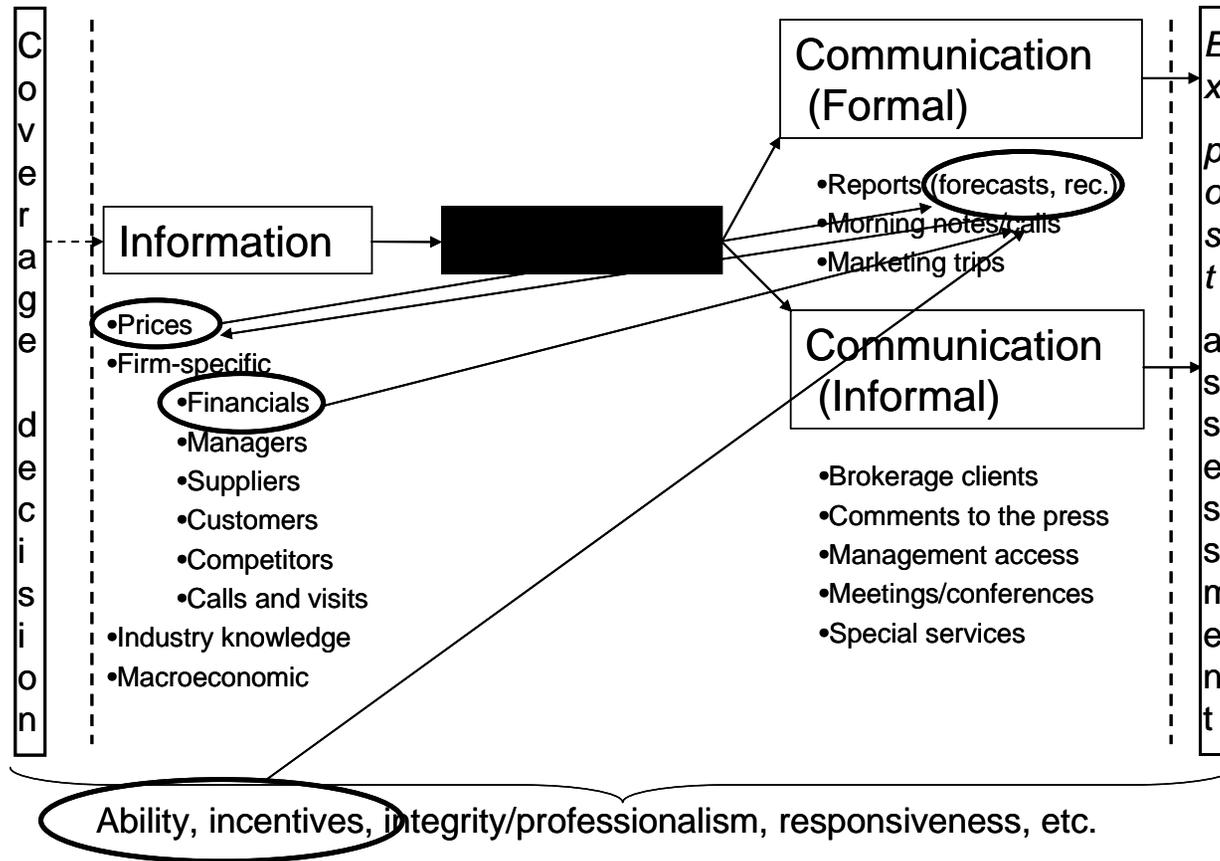


Figure 2 – Timeline of Major Areas of Research 1968-2006

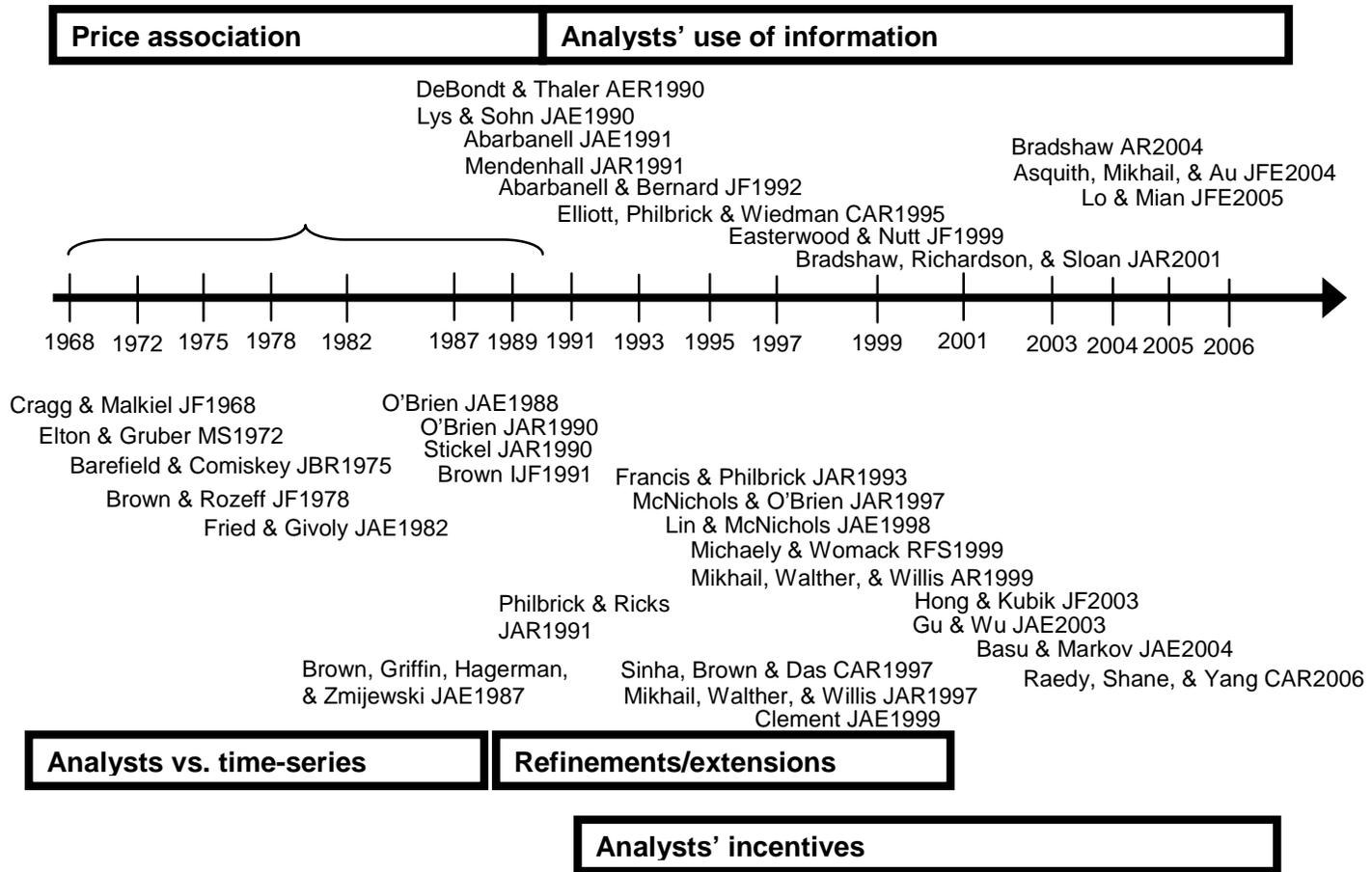


Table 1 – Summary of Institutional Investor Ranking Surveys 1998-2005

	1998	1999	2000	2001	2002	2003	2004	2005
Industry knowledge	1	1	1	1	1	1	1	1
Integrity/professionalism					2	2	2	2
Accessibility/responsiveness				2	3	3	3	3
Management access				7	5	5	4	4
Special services	4	3	2	5	7	6	5	5
Written reports	3	2	4	6	8	7	7	6
Timely calls and visits				4	4	4	6	7
Communication skills					10	9	8	8
Financial models			3	8	9	10	10	9
Management of conflicts of interest				3	6	8	9	10
Stock selection	2	5	7	10	11	11	11	11
Earnings estimates	5	6	5	9	12	12	12	12
Quality of sales force	7	7	8	11	13	13	13	
Market making	8	8	9	12	14	14	14	
Primary market services			10		15	15	15	
Servicing	6	4	6					

Table 2 – Change in Ranked Characteristics, Institutional Investor Ranking Surveys 1998-2005

	<u>Avg. rank change, 98-05</u>
(#2) Integrity/professionalism	0.13
(#3) Accessibility/responsiveness	0.12
Management access	0.11
Timely calls and visits	0.07
Communication skills	0.06
Financial models	0.05
Management of conflicts of interest	0.04
Special services	0.01
(#1) Industry knowledge	0.00
Primary market services	0.00
Market making	-0.02
Written reports	-0.02
Quality of sales force	-0.04*
Servicing	-0.05
Earnings estimates	-0.06*
Stock selection	-0.10***