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Keywords: financial analysts, analyst following, analyst forecasts, firm coverage

Abstract
This paper explores the determinants of observed analyst-firm pairings. We adopt an analyst/brokerage house perspective that allows us to examine not only firm-level characteristics as in prior research, but also attributes of the analyst and the analyst's brokerage house that may drive these pairings. Our empirical analyses provide two primary insights. First, analyst characteristics such as industry expertise and relative experience, and brokerage house characteristics such as continuity of coverage, are associated with the decision to follow a firm. Second, there is substantial variation in the association between firm, analyst, and brokerage house characteristics and the decision to follow a firm; this occurs across individual analysts as well as across different types of brokerage houses. Overall, our results provide further insights into the factors leading to observed analyst-firm pairings, and indicate that these factors vary across analysts and their brokerage houses – suggesting richer associations than the average firm-level relationships documented by prior research.

1. Introduction

What factors cause an analyst to follow a particular set of firms? For example, a prominent analyst with almost 15 years of forecasting experience at a major brokerage house issued annual earnings forecasts for 20 firms in the year 2000. While all the firms were in the technology sector, they spanned five industries: software and electronic data processing, office and communication equipment, **[end of page 277]** semiconductors, electronic systems, and computer manufacturing. The firms also ranged in size from over $100 billion in market capitalization (IBM and Hewlett-Packard) to under $600 million in market cap (Aspen Technologies and Intergraph). Further, the analyst did not cover a number of very large companies in these industries (such as Compaq and Computer Associates), nor any of the almost 1,100 other firms falling within these five industries.

This paper explores the determinants of observed analyst-firm pairings. To better understand this issue, we adopt an analyst/brokerage house perspective. Prior research generally adopts a firm-level perspective – that is, it examines the determinants of the number of analysts following a particular firm. However, analysis at the firm-level reflects the aggregate demand for and supply of analyst research; these characteristics cannot explain, for example, why the analyst above would choose to follow IBM instead of Compaq, both of which were large and profitable firms in 2000. Our focus at the analyst/brokerage house level allows us to examine a broader range of factors likely to drive observed analyst-firm pairings. Consistent with this perspective, we assume that analysts themselves, or their employing brokerage houses, make conscious allocation decisions regarding which firms to follow. This assumption has intuitive economic appeal, as either the analyst or their employer should be well positioned to identify the firms likely to provide the greatest net benefit such as compensation or revenue generation.

Our primary sample consists of ''experienced'' analysts, defined as those with 5 or more years of forecasting experience. This focuses the analyses on the subset of analysts who have demonstrated a capacity to perform and remain within the analyst industry and who are thus more likely to have decision rights over which firms they follow (as anecdotal evidence suggests that the ability to choose firms increases with an analyst's tenure). In addition, the employing brokerage house is more likely to understand the strengths of this subset of analysts, and accordingly be better able to match them to firms the brokerage house wishes to cover.[3]

Our empirical analyses examine three groups of characteristics that potentially affect observed analyst-firm pairings: those specific to the firm, to the analyst, and to the employing brokerage house. The primary analyses

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[3] Furthermore, Hong et al. (2000) argue that inexperienced analysts face higher career concerns relative to experienced analysts. Consistent with these implicit incentives, they find that inexperienced analysts deviate less from consensus forecasts. This suggests that experienced analysts are more likely to make unconstrained decisions, both in their portfolio choice (the current paper's focus) as well as their output (e.g., earnings forecasts). In addition, turnover is greatest in the initial years of employment, suggesting that our focus on more experienced analysts will better capture analysts in a ''steady-state'' decision environment.

focus on year-to-year changes in the set of covered firms: that is, we use an ordered probit model to jointly examine the decision to drop coverage, continue providing no coverage, continue coverage, or initiate coverage of a particular firm across the current and prior years. Another distinguishing feature of the research design is that we use not only firms for which the analyst has issued forecasts but also a population of ''target firms'', or firms the analyst could potentially have covered but did not follow. To focus on firms likely to fall under the analyst's purview, we include in the target firms only firms belonging to the industries the analyst covered in the previous year.

Our empirical results offer some important insights. First, we provide evidence that analyst-firm pairings are driven not only by firm-level characteristics that are the focus of prior research, but also by factors specific to the analyst and the employing brokerage house. In particular, we find that an analyst is more likely to follow a firm that falls within his or her primary industry of expertise. We also find some evidence that an analyst is more likely to follow a firm when his or her experience is greater relative to the other analysts following that firm. With regard to the employing brokerage house, we find that an analyst is more likely to initiate coverage of a firm if the firm was previously followed by another analyst employed at the same brokerage house but who is no longer forecasting for that brokerage house. This is consistent with continuity of coverage also driving analyst-firm pairings, and further suggests an important role for the brokerage house in the coverage decision. An analyst is also more likely to cover a firm when the brokerage house has had a recent investment banking relationship with the firm. Interestingly, this effect appears to decline (but does not disappear) after Regulation Fair Disclosure became effective in 2000, consistent with that regulation having a noticeable impact on which firms are followed. Finally, our results regarding firm-level characteristics confirm the findings of prior studies on aggregate analyst following: that an analyst is more likely to **[end of page 278]** provide coverage of a firm that is increasing in size, belongs to or has joined the S&P 500 index, has experienced an increase in trading volume, or has issued debt or equity during the past year. The above insights are robust to alternative measures of both our dependent and independent variables, to alternative sampling mechanisms to define the population of ''target firms'', to distinguishing between the drop versus initiate decision, and to stratifying the sample into large versus small firms. Overall, our results suggest that observed analyst-firm pairings are determined by a range of factors reflecting characteristics specific to the firm, the analyst, and the employing brokerage house.

Our analyses also reveal substantial variation in the above associations, not only across individual analysts and analyst characteristics but also both within and across types of brokerage houses (e.g., investment banks versus pure research firms). These latter results lend further support to the notion that the decision to follow a particular firm reflects a unique combination of traits specific to an analyst and the employing brokerage house, as compared to a simple aggregation averaged across all analysts.

Our findings are of interest for several reasons. First, an understanding of the factors that lead analysts to follow (or not follow) a firm may assist corporate managers in formulating communication and investor relation strategies. Second, regulators have revealed strong interest in the role analysts play in capital markets, as evidenced by recent regulations (such as Regulation Fair Disclosure) and censures (such as the Global Settlement).[4] Insights into how analyst-firm pairings arise may inform future debates on the potential sources of conflict of interest, as well as on any necessary monitoring and enforcement of this important group of information intermediaries. Third, investors likely wish to understand these factors as well, to allow more informed assessments of the quality of and potential sources of bias in analyst forecasts. Finally, we expand the prior literature, particularly the literature that focuses on the firm characteristics associated with analyst following (e.g., Bhushan, 1989; Barth et al., 2001), by revealing that the factors driving observed analyst-firm pairings are richer than the average firm-level associations previously documented.

The remainder of the paper is organized as follows. Section 2 provides a summary of relevant prior research and institutional background. Section 3 develops our empirical model and associated hypotheses. Section 4 presents the descriptive statistics and empirical results. Section 5 discusses sensitivity analyses, and Section 6 concludes.

2. Prior Literature and Institutional Background

2.1 Prior Literature

[4] Regulation Fair Disclosure (FD), issued in 2000, mandates that all publicly traded companies must disclose material information to all investors at the same time. The impetus for this regulation arose, in part, due to certain high profile analysts and investors reportedly receiving information before other investors. The Global Settlement, reached in 2003, required 10 of the largest US investment firms to address issues of conflicts of interest within their businesses. The firms were also charged with a collective fine of $450 million.

Prior research examines the characteristics of firms that attract an analyst following. This literature is generally motivated by the role analysts play as information intermediaries (e.g., Schipper, 1991). Bhushan's (1989) seminal study finds that a number of firm characteristics (e.g., ownership structure and size) are associated with analyst following. O'Brien and Bhushan (1990), building on Bhushan's paper, investigates changes in analyst following and institutional ownership in a simultaneous equations framework. Their investigation shows that the previously documented empirical link between changes in analyst following and changes in firm size disappears after considering simultaneity. McNichols and O'Brien (1997) suggests that analysts are more likely to provide forecasts for firms whose future prospects are viewed more favorably, and more likely to drop stocks viewed less favorably. Hayes (1998) provides an analytical model consistent with these results, suggesting that analysts are more likely to issue forecasts for firms expected to perform well. Lang and Lundholm (1996) finds that firms with more informative disclosure policies attract a larger analyst following, while Barth et al. (2001) finds that analyst following varies directly with the level of a firm's intangible assets. **[end of page 279]**

We extend this literature by taking an analyst/brokerage house perspective on how analyst-firm pairings arise.[5] In particular, we focus on the characteristics of the suppliers of firm research (e.g., analysts and their brokerage houses) in addition to the characteristics of the covered firms. This allows consideration of a broader range of factors likely to affect the portfolio of firms followed.

2.2. Institutional background

Many business decisions involve the optimal allocation of available resources given constraints (e.g., choosing which projects to fund from among a portfolio of possible projects, given a limited amount of funds to invest). Analysts and their brokerage houses make similar allocation decisions in the face of resource constraints – such as time, data, and access to management – and are unable to analyze and provide output on an unlimited number of firms. These constraints require an allocation of limited resources to generate outputs such as earnings estimates and stock recommendations and naturally limit the number of firms that can be followed. This resource allocation likely reflects expectations of optimizing some net benefit, such as compensation (for the analyst) or revenue generation (for the analyst's brokerage house).

Accordingly, we argue that the decision to follow a particular firm reflects a conscious allocation decision. The decision rights over this allocation may reside with the analyst, the employing brokerage house, or both. Several institutional features suggest that the rights reside with the analyst. Individual analysts likely have the best awareness of their capacities to research firms. This includes specific knowledge of the analyst's own resources, such as his or her individual skills, industry expertise, and access to management. This also includes knowledge of the resources available to the analyst from the brokerage house, including data and assistants to perform additional research, as well as the analyst's ability to leverage these resources. Anecdotal evidence affirms that analysts have at least some decision rights over which firms they follow. We interviewed several current and former senior analysts to discuss the portfolio formation process. The discussions verified that the analyst's ability to choose which firms to follow generally increases with the tenure of the analyst. In addition, more experienced analysts often submit annual business plans, detailing their intentions regarding the firms they plan to follow, including those for which the analyst will initiate and drop coverage.

However, analysts vary on a number of dimensions, including experience/seniority, forecasting ability, and industry focus. In addition, employing brokerage houses may differ in their intended clientele and operational objectives. These differences may affect where the decision rights lie, suggesting that the employing brokerage house may retain some, or all, decision rights over which firms an analyst will follow. This is likely particularly true for analysts who are beginning their careers; such analysts are typically assigned which firms to cover, often under the supervision of a senior analyst.

Based on the above discussion, we focus our primary sample on ''experienced'' analysts, defined as those having five or more years of experience. Though this is a somewhat arbitrary classification, it will capture the subset of analysts who, having demonstrated an ability to generate forecasts and to remain in the brokerage industry, are more likely to have discretion in choosing which firms to follow. It also captures a group of analysts whose employers are more informed about their capabilities. We later examine differences between experienced and inexperienced analysts.

Finally, we note two additional institutional factors that are relevant to our study. First, firms being considered for coverage can be broadly classified into two groups. The first group represents firms characterized

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[5] Although Clarke et al. (in press) also examine analysts' coverage decisions, they only examine a sample of all-star analysts, who switch investment banks (thus representing less than 1% of the analyst population – see their Table 1). Their study focuses on whether analyst behavior is influenced by investment banking relationships and whether analyst behavior, in turn, affects investment banking deal flow.

variously as ''maintenance'' or ''must have'' firms. These firms are often among the largest in their industry, and typically fall within key indices such as the S&P 500. Client demand for research on these firms is usually substantial owing to the firms' high visibility, suggesting that the analyst (or brokerage house) has little discretion in the decision to follow these firms. The second group represents firms over which the analyst (or brokerage house) likely has more discretion; by definition, these will tend to be smaller in size. Our analyses attempt to capture this aspect with various **[end of page 280]** proxies for firm size and membership in a stock index. We also conduct additional analyses by stratifying the sample based on firm size.

The second institutional factor stems from prior research (Cowen et al., 2006) suggesting that brokerage houses can be classified into four main categories: full-service investment banks, which use revenues from both underwriting and brokerage (i.e., trading) services to fund research; non-underwriter (or syndicate) banks, which fund research through modest fees from distributing (but not underwriting) new issues and from revenues from trading services; pure brokerage firms, which fund research through trading revenues; and research firms, which provide no investment banking or trade execution services but fund their research activities through direct sales of equity research to clients. The differing organizational structures across these types of brokerage houses may affect the incentives of analysts and their employers to follow particular firms. This, in turn, may affect the associations leading to observed analyst-firm pairings. Accordingly, we later explore whether differences in types of brokerage houses affect the associations we document.

3. Research design and hypothesis development

To investigate the decision to follow a firm, we employ a changes specification, examining the change in the likelihood of a firm falling within the portfolio of firms covered by the analyst. Specifically, we jointly examine whether an analyst drops coverage, continues to provide no coverage, continues coverage, or initiates coverage for a firm across the current and prior years. This specification enables us to focus on factors that influence changes in coverage and is intended to capture the analyst's (and/or brokerage house's) incorporation of changing characteristics into their portfolio construction. Accordingly, we perform the following ordered probit analysis (see also Appendix A for variable definitions):

$$\text{CHANGE}_{ijt} = \beta_0 + \beta_1 \Delta \text{SIZE}_{jt} + \beta_2 \Delta \text{SP500}_{jt} + \beta_3 \Delta \text{FOLL}_{jt} + \beta_4 \Delta \text{VOL}_{jt} + \beta_5 \Delta \text{RET}_{jt} + \beta_6 \Delta \text{MB}_{jt}$$
$$+ \beta_7 \Delta \text{INST}_{jt} + \beta_8 \text{ISSUE}_{jt} + \beta_9 \text{NFIRMS}_t + \beta_{10} \text{NFIRMS\_2}_{it} + \beta_{11} \text{INDUST}_{ijt}$$
$$+ \beta_{12} \text{RELEXP}_{ijt} + \beta_{13} \Delta \text{BSIZE}_{jt} + \beta_{14} \text{BFOLL}_{jt} + \beta_{15} \text{DEPART}_{ijt} + \beta_{16} \text{IBANK}_{ijt} + \rho_{ijt} \quad (1)$$

The dependent variable, CHANGE, captures changes in a particular firm's status within the portfolio of firms followed by an analyst across years $t-1$ and t. CHANGE is measured as a discrete variable equal to - 1 if analyst i follows firm j in year $t-1$ but not in year t (i.e., drops coverage); 0 if analyst i does not follow firm j in either year $t-1$ or year t (i.e., provides no coverage); 1 if analyst i follows firm j in both years $t-1$ and year t (i.e., maintains coverage); and 2 if analyst i does not follow firm j in year $t-1$ but does in year t (i.e., initiates coverage). Thus, larger values of CHANGE generally reflect an increase in the analyst's likelihood of following the firm; hence we use an ordered probit specification.

A distinguishing feature of our paper is that not only do we use observations where the analyst actually follows the firm, we also effectively create observations where the analyst potentially could have followed the firm but (implicitly or explicitly) chose not to. Constructing our dependent variable in this fashion requires defining the population of ''target'' firms that the analyst could have followed but did not. In the extreme, an analyst can consider any firm as a possible target. However, we anticipate that analysts (or their brokerage houses) consider only subsets of firms, likely reflecting core competencies and incentives. Accordingly, we define the population of target firms to include all firms falling in the four-digit industry groupings (identified via I/B/E/S) for which analyst i forecasts in year $t-1$. This will restrict our candidate firms to the industries the analyst has self-selected into.[6]

Note that inclusion of a firm in this subset does not suggest that the firm has been explicitly evaluated by the analyst (or brokerage house) for inclusion in the portfolio of firms followed. Rather, our approach represents a continuum of effort regarding how firms are chosen. For example, some firms may appear in a familiar trade journal. For several of these, the analyst may review annual reports and other financial information to further research the firm. The analyst may then follow up by contacting personnel within the firm, the firm's suppliers, and the firm's competitors. Ultimately, the analyst may **[end of page 281]** initiate coverage of the firm. Constructing the population of firms the analyst could potentially have followed reflects trading off the appropriate break in this ''effort continuum''. Of course, the actual set of firms evaluated by the analyst for inclusion in his or her portfolio, as well as the level of evaluation, is unobservable. Including the entire universe of firms provides for any level of effort

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[6] Note that the average analyst in our sample follows five industries.

(including none), while restricting ourselves to a subset may eliminate firms that the analyst could potentially have followed. Thus, our process of defining the target firms is meant to capture firms that would reasonably fall within the pool of firms the analyst could follow. Since this choice is somewhat arbitrary, we examine the sensitivity of our results to alternative definitions of this set of firms.

We then model the determinants of the analyst's decision to include firm j in the portfolio of firms followed. The independent variables can be classified into three groups: characteristics specific to the firm followed (or not followed), characteristics specific to the analyst, and characteristics of the analyst's employing brokerage house.

Firm-specific characteristics. Prior research (e.g., Bhushan, 1989) shows a number of firm characteristics associated with analyst following. First, larger firms may be of greater interest to clients, have richer disclosure/information environments, and provide more visibility and opportunities for revenue generation for both the analyst and the brokerage house. Accordingly, we include the change in both the firm's size (ΔSIZE) and the firm's inclusion in the S&P 500 index (ΔSP500) to proxy for these general effects. We measure ΔSIZE as the change in the log of the market value of firm j from year t - 1 to year t. ΔSP500 equals - 1 if firm j is in the S&P 500 in year t - 1, but not in year t; 0 if firm j is either continuously included or excluded from the S&P 500 for years t - 1 and t; and 1 if firm j is not in the S&P 500 in year t - 1, but is in year t. We predict positive associations between these variables and the decision to follow the firm, as the analyst is more likely to maintain or initiate coverage of firms that are growing or have been added to the S&P 500 index.

The analyst's anticipated effort with respect to other analysts vis-à-vis a particular target firm may also affect the decision to cover a firm (e.g., O'Brien and Bhushan, 1990). We proxy for this effect using ΔFOLL, the change in the number of analysts following firm j from year t - 1 to year t. Typically, if increased analyst following indicates a richer information environment for the target, then ΔFOLL will be positively associated with the analyst's decision to maintain or initiate coverage of a firm, because either the available information improves or the firm attains a higher profile (perhaps, for example, suggesting greater future trading commissions). However, to the extent ΔSIZE and ΔSP500 control for the information environment, a firm receiving increasing attention from competing analysts may require greater effort by the analyst to distinguish himself or herself as an expert. This possibility suggests that the decision to maintain or initiate coverage for firm j varies inversely with analyst following. Accordingly, we do not predict the sign on ΔFOLL.

Prior literature suggests that analysts issue research reports, including earnings forecasts, in part to generate trading volume, which may in turn affect commissions earned by their brokerage houses as well as compensation provided to the analyst (e.g., Irvine, 2001; Cowen et al., 2006). Accordingly, we include a variable to capture the change in trading volume, ΔVOL, measured as the change in the log of annual trading volume in firm j's common stock from year t - 1 to year t. The predicted sign is positive, as the decision to maintain or initiate coverage of a firm should be positively associated with increases in trading volume.

A fifth factor that may affect the decision to cover a firm is the firm's performance. McNichols and O'Brien (1997) argue that analysts tend to initiate coverage on stocks they expect to perform well and to stop coverage on stocks they believe will perform poorly. Firms exhibiting stronger performance may reflect greater upside in potential benefits for the analyst and their brokerage house. Accordingly, we include ΔRET, the change in stock return for firm j across years t - 1 and t; the predicted sign for this variable is positive. We also include a proxy for the change in the firm's growth potential, ΔMB, measured as the change in the end-of-year market-to-book ratio for firm j across years t - 1 and t. We posit that firms with increased growth potential have higher investor interest, so the predicted sign is again positive.

Prior research (e.g., Bhushan, 1989) also reveals that analyst following (at the firm-level) varies directly with the percentage of the firm's shares owned by institutions, consistent with institutions generating demand for analyst research on the firms in which they have ownership. Accordingly, we include ΔINST, the change in the percentage of the firm's common shares owned by institutions from **[end of page 282]** year t - 1 to year t. These data are collected from the Spectrum database, and the predicted sign is positive.

Finally, we include an indicator variable ISSUE, equal to 1 if firm j issues debt or equity in year t - 1, and 0 otherwise. A firm that is active in raising capital is more likely to be covered, therefore the predicted sign is positive. This variable is compiled from the SDC Platinum Global Corporate Financing database. We maintain ISSUE as a levels (as opposed to a change) variable because the act of issuing capital is likely associated with the decision to cover a firm.[7]

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[7] Because prior research documents that analyst following (at the firm-level) is positively associated with the level of a firm's intangibles (Barth et al., 2001), we also conduct sensitivity analyses incorporating proxies for this firm characteristic: R&D expense (RD) and advertising (ADV) expense, both scaled by the firm's operating expenses and measured at the end-of-year t - 1. We also include a dummy variable (MA) equal to 1

Analyst-specific characteristics. The second group of proxies captures characteristics specific to the analyst that affect the decision to follow a firm. We first include NFIRMS as a proxy for the analyst's workload, measured as the number of firms followed by analyst i in year t. Adding or retaining a specific firm reduces the resources (e.g., the time to review annual reports) available to evaluate other firms. This suggests that the greater the number of firms followed, the less likely it is that the analyst initiates coverage on an additional firm, leading to a negative predicted sign on NFIRMS. Alternatively, prior research (e.g., Clement, 1999; Jacob et al., 1999) suggests that NFIRMS proxies for the analyst's ability to target a large portfolio. This perspective suggests a positive predicted sign. Thus, we do not predict the sign on NFIRMS. We also include the squared level of the number of firms followed (NFIRMS_2) to capture any potential nonlinearities in the association.[8]

Building on Mikhail et al. (1999), we include INDUST, an indicator variable equal to 1 if the firm belongs to the primary industry followed by the analyst in year t - 1. This variable controls for synergies associated with following firms in the analyst's industry of specialization and has a positive predicted sign. The primary industry is defined using the four-digit industry grouping per I/B/E/S having the largest representation for analyst i during year t - 1.

Finally, we include a variable RELEXP to capture the difference between analyst i's forecasting experience and the mean for all analysts following firm j in year t. Forecasting experience is measured as the number of years an analyst appears on the I/B/E/S database. If a particular analyst has greater forecasting experience than the mean of analysts forecasting for firm j, that analyst may be more likely to follow the firm (e.g., perhaps perceiving a comparative skill advantage). Thus, the predicted sign on this variable is positive.

Brokerage house characteristics. We include four variables to capture characteristics of the analyst's employing brokerage house that may affect the decision to follow a particular firm. First, the decision to follow a firm is likely a function of the resources available to the analyst. Thus, we include ΔBSIZE, the change from year t - 1 to year t in the total number of analysts forecasting for the brokerage house that employs analyst i. Larger brokerage houses likely provide better resources to the analyst (e.g., administrative support, access to client management). Thus, we predict a positive sign for this variable.

We then include two variables to capture how the coverage decision is affected by the brokerage house portfolio of firms. First, presuming that brokerage houses discourage overlap, we include BFOLL, an indicator variable equal to 1 if another analyst employed by the same brokerage house forecasts for firm j in year t. The predicted sign is negative. We also include DEPART, an indicator variable equal to 1 if another analyst employed by the same brokerage house forecasts for firm j in year t - 1, but that analyst is not forecasting for the brokerage house in the current year. If turnover within a brokerage house creates a need to follow particular firms previously covered to provide continuity in coverage, **[end of page 283]** then the predicted sign is positive. Both of these variables emphasize the role of the brokerage house in coverage decisions. Again, defining these indicator variables in terms of changes results in unclear economic interpretations, so both are defined as levels.

Finally, we include IBANK, an indicator variable equal to 1 if the brokerage house employing analyst i is an underwriter on any new issues (including stock or bond issuances, and any merger or acquisition activity) for firm j in years t - 2, t - 1, or t, and equal to 0 otherwise. We measure the variable over 3 years as investment banking relationships typically extend beyond a particular transaction in a particular year. Based on Michaely and Womack (1999), we hypothesize that a firm is more likely to be followed if it has an investment banking relationship with the brokerage house. Similar to ISSUE, this variable is coded from the SDC database, and the predicted sign is positive.[9]

4. Sample, Descriptive Statistics, and Empirical Results
4.1 Sample

Table 1 summarizes our sample compilation. Our starting point and primary data source is the I/B/E/S database for the period 1993–2002. We focus on active analysts by eliminating analysts following three or fewer firms in a given

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if the firm engages in a merger or acquisition during year t - 1, and equal to 0 otherwise, as acquisition activity may be another firm-level characteristic that could affect the coverage decision. If the analyst is more likely to follow a firm that has greater levels of intangible assets, or has engaged in merger/acquisition activity, then the predicted sign is positive on all three variables. Untabulated results reveal RD obtains the wrong sign, while ADV and MA are positive as predicted. The associations with the other variables remain unchanged from the primary analysis.

[8] Note, we do not measure these variables as changes, primarily to avoid inducing a mechanical relationship with our dependent variable (i.e., an increase in NFIRMS should mechanically have a positive association with an increase in CHANGE). By maintaining NFIRMS as a levels variable, its interpretation in the changes regression is the likelihood of dropping/adding coverage for a given number of firms the analyst follows.

[9] Note that multiple brokerage houses are often listed as investment banks on any particular deal within the SDC database. We use all available brokerage houses to identify investment banking relationships for this variable.

year; similarly, we eliminate teams (as opposed to individuals) by excluding analysts following 30 or more firms in a given year. These cut-offs approximate the 1% and 99% of firms followed. As stated previously, we restrict the primary analysis to analysts with five or more years of experience, in order to focus on analysts more likely to retain decision rights over which firms to follow as well as to focus on analysts whose abilities are better understood by the employing brokerage house. Our sample includes 82,762 analyst-firm-year observations, i.e., analyst-firm-years where the analyst issued at least one annual earnings forecast for the firm.[10] Note that these observations constitute the portion of our data for which the analyst (or brokerage house) has chosen to follow the firm. Table 1 also presents the analyst-firm pairings for the ''target'' firms, or firms the analyst could potentially have followed but did not. These are defined to include all firms in the industries for which the analyst provides forecasts in year t - 1. This yields an additional 2,199,371 analyst-firm pairings representing firms the analyst did not follow. Thus, our analysis is based on 2,282,133 possible analyst-firm pairings. On average, analysts follow six firms and have an additional 166 target firms. The overall number of observations increases through the 1990s, consistent with the increase in both analysts and firms.

Table 2 presents the analyst-firm pairings for the observations used to estimate Eq. (1), which compares the change in the firm's status in the portfolio of firms the analyst follows across years t - 1 and t; that is, whether a firm is dropped, receives no coverage, receives continued coverage, or is initiated in coverage. Computing the change specification results in losing 1 year from the sample (1993) as well as losing observations in which analyst-firm pairings cannot be matched across years t - 1 and t. The final sample of 1,066,043 observations includes 6794 instances in which the firm is dropped from year t - 1 to t, 1,011,042 instances in which the firm receives no coverage in either in year t - 1 or year t, 42,453 instances in which the firm receives continued coverage, and 5754 instances for which coverage is initiated.[11] **[end of page 284]**

Table 1
Sample compilation

Year	Unique analysts (1)	Unique firms (2)	Unique analyst-firm pairings (followed) (3)	Average firms followed by analyst i (4)	Unique target analyst-firm pairings (not followed) (5)	Average target firms not followed by analyst i (6)	Total unique analyst-firm pairings (3) + (5) = (7)	Average total firms by analyst i (4) + (6) = (8)
1993	1070	728	4091	4	75,956	71	80,047	75
1994	1181	914	4864	4	107,111	91	111,975	95
1995	1152	1466	6925	6	153,423	133	160,348	139
1996	1153	1797	8037	7	188,215	163	196,252	170
1997	1215	1962	8429	7	224,771	185	233,200	192
1998	1352	2352	10,025	7	296,233	219	306,258	227
1999	1428	2252	10,168	7	302,733	212	312,901	219
2000	1494	1969	9535	6	283,088	189	292,623	196
2001	1508	2011	10,384	7	301,343	200	311,727	207
2002	1408	2058	10,304	7	266,498	189	276,802	197
Pooled[a]	3299	4690	82,762	6	2,199,371	166	2,282,133	172

This table presents analyst-firm pairings available from I/B/E/S for the period 1993–2002, which represent a critical interim step in the creation of our dependent variable. The sample is restricted to "experienced" analysts (i.e., those analysts appearing for five or more years on the I/B/E/S dataset) and to analyst-firm pairings with data necessary to estimate Eq. (1). Columns (1) and (2) present the number of unique analysts and firms within each year, respectively. Column (3) presents the analyst-firm pairings wherein the analyst follows the firm, with column (4) presenting the average by analyst. Column (5) presents the target analyst-firm pairings, that is firms the analyst potentially could have followed but did not; column (6) presents averages by analyst. Firms in these latter two columns are restricted to those falling within all four-digit standard industry groupings (SIGs, per I/B/E/S) for which the analyst has issued a forecast in the prior year. Column (7) presents the total analyst-firms pairings. Column (8) presents the corresponding average by analyst.

ᵃ Note that amounts in columns (1), (2), (4), (6), and (8) are not additive.

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[10] We note that the average number of firms followed (6, see column (4) of Table 1) is lower than that typically found in prior research (e.g., across the entire I/B/E/S database, the average analyst follows 16 firms). Our lower number is due to the data requirements imposed by Eq. (1). When these data requirements are not imposed, as in the creation of our variable NFIRMS, we obtain the more typical value (see NFIRMS in Table 3).

[11] It is noteworthy that drops are slightly higher than initiations except in 2002. This arises primarily because the dependent variable is measured as a change across t - 1 and t. For some initiations, there will be no observation for t - 1 (e.g., if the firm has an IPO in year t, there is no data for t - 1); these observations will be excluded in our change specification of Eq. (1). In addition, the increasing number of firms in the sample over time except in 2002 leads to a greater likelihood that some initiations are excluded due to firms missing in year t - 1 than drops being excluded due to firms missing in year t. However, we note that our results are consistent for an alternative levels specification (discussed later), which is unaffected by this issue.

Table 2
Analyst-firm pairings – changes in coverage

Year	Drops coverage (CHANGE = − 1) (1)	No coverage (CHANGE = 0) (2)	Continues coverage (CHANGE = 1) (3)	Initiates coverage (CHANGE = 2) (4)	Total Obs (1) + (2) + (3) + (4) = (5)
1994	441	48,213	2592	354	51,600
1995	545	64,943	3045	432	68,965
1996	702	96,509	4644	630	102,485
1997	789	109,822	4927	680	116,218
1998	781	123,883	4801	652	130,117
1999	897	151,016	5815	763	158,491
2000	1001	139,646	5543	605	146,795
2001	870	134,503	5363	772	141,508
2002	768	142,507	5723	866	149,864
Pooled	6794	1,011,042	42,453	5754	1,066,043

This table provides descriptive data on analyst-firm pairings used in our primary changes regression of Eq. (1). Column (1) provides the annual analyst-firm observations in which the analyst forecasts for the firm in year $t − 1$, but not in year t (i.e., the analyst drops coverage, and the dependent variable CHANGE equals −1). Column (2) provides the annual analyst-firm observations in which the analyst does not forecast for the firm in either year $t − 1$ or t (i.e., the analyst provides no coverage, and the dependent variable CHANGE equals 0). Column (3) provides the annual analyst-firm observations in which the analyst issues forecasts for the firm in both years $t − 1$ and t (i.e., the analyst continues coverage, and the dependent variable CHANGE equals 1). Column (4) provides the annual analyst-firm observations in which the analyst does not forecast for the firm in year $t − 1$, but does in year t (i.e., the analyst initiates coverage, and the dependent variable CHANGE equals 2). Column (5) presents the sum of the other four columns. Note the sample period loses one year (1993) due to the change specification.

4.2. Descriptive Statistics and Empirical Results

Table 3 provides descriptive statistics for the variables used in the analysis. Because we generally estimate parameters for annual regressions, we present statistics for means across the nine sample years 1994–2002. The average firm sees increases in size (ΔSIZE = 0.055), analyst following **[end of page 285]**

Table 3
Descriptive statistics

Variable	Average of annual means	Average of annual medians	Std. dev. of annual means
Dependent variable			
CHANGE$_{ijt}$	0.046	0.000	0.005
Firm-specific variables			
ΔSIZE$_{jt}$	0.055	0.072	0.125
ΔSP500$_{jt}$	0.007	0.000	0.007
ΔFOLL$_{jt}$	0.238	0.111	0.407
ΔVOL$_{jt}$	0.104	0.086	0.099
ΔRET$_{jt}$	−0.030	−0.011	0.260
ΔMB$_{jt}$	−0.122	−0.055	0.274
ΔINST$_{jt}$	0.014	0.009	0.013
ISSUE$_{jt}$	0.091	0.000	0.031
Analyst-specific variables			
NFIRMS$_{it}$	15.145	14.667	0.675
NFIRMS_2$_{it}$	258.838	215.333	22.466
INDUST$_{ijt}$	0.388	0.000	0.016
RELEXP$_{ijt}$	3.017	3.069	0.719
Brokerage house (i.e., employer) variables			
ΔBSIZE$_{it}$	6.360	2.556	2.492
BFOLL$_{ijt}$	0.108	0.000	0.019
DEPART$_{ijt}$	0.003	0.000	0.001
IBANK$_{ijt}$	0.008	0.000	0.001

This table presents descriptive statistics for the variables used in the primary changes regression of Eq. (1). We present the mean and medians, averaged across the nine sample years. That is, the mean (median) of each variable was obtained for each year 1994–2002, and the average of these nine values is reported above as the "average of annual means" ("average of annual medians"). "Std. dev." shows the standard deviation of the nine annual means.
All variables are defined in Appendix A.

(ΔFOLL = 0.238), trading volume (ΔVOL = 0.104), and institutional ownership (ΔINST = 0.014), and sees decreases in both stock returns (ΔRET = - 0.030) and the market-to-book ratio (ΔMB = - 0.122). About 9% of the firms issue debt or equity in the prior year (ISSUE = 0.091). The average analyst follows 15 firms (NFIRMS = 15.145), with 39% of the covered firms falling within the primary industry (INDUST = 0.388). Consistent with our focus on experienced analysts, the analysts in our sample have 3 years more experience than the average for all analysts following the firm (RELEXP = 3.017). About 11% of the firms are followed by another analyst at the same

brokerage house (BFOLL = 0.108).[12] Less than 1% of firms were followed previously by another analyst at the same brokerage house (DEPART = 0.003), and less than 1% of firms have investment banking relationships with the employing brokerage house (IBANK = 0.008).

Table 4 presents the results of the ordered probit specification examining the decision to drop coverage (dependent variable = -1), provide no coverage (0), continue coverage (+1), or initiate coverage (+2) of the firm. Because we primarily examine effects over our entire sample period, we focus on the ''Avg'' column, which presents coefficients averaged over the nine sample years and significance levels calculated using these nine coefficients (i.e., a Fama-Macbeth calculation).[13] Of the firm-specific variables, ΔSIZE, ΔSP500, ΔVOL, and ISSUE are all significantly positive as predicted, consistent with analysts being more likely to continue or initiate coverage of a firm that has increased in size, joined the S&P 500, increased in trading volume, and issued debt or equity in the past year. ΔFOLL is positive and marginally **[end of page 286]**

Table 4
Dropping coverage, providing no coverage, continuing coverage, or initiating coverage of the firm

Variable	Pred sign	1994	1995	1996	1997	1998	1999	2000	2001	2002	Avg	Pooled
N		51,600	68,965	102,485	116,218	130,117	158,491	146,795	141,508	149,864	118,449	1,066,043
Intercept1	+/−	1.701***	1.776***	1.831***	1.939***	1.970***	1.959***	1.857***	1.843***	1.837***	1.857***	1.861***
Intercept2	+/−	−4.099***	−4.197***	−4.230***	−4.248***	−4.382***	−4.419***	−4.335***	−4.369***	−4.441***	−4.302***	−4.317***
Intercept3	+/−	−5.068***	−5.133***	−5.171***	−5.171***	−5.300***	−5.348***	−5.333***	−5.287***	−5.385***	−5.244***	−5.251***
Firm-specific variables												
ΔSIZE	+	−0.075	0.247***	0.191***	0.058***	−0.018	0.135***	0.025*	0.076***	−0.012	0.070***	0.056***
ΔSP500	+	0.039	0.558***	0.377***	0.253***	0.296***	0.143***	0.272***	0.128***	0.154***	0.247***	0.279***
ΔFOLL	+/−	0.050***	−0.007	0.013***	−0.003	−0.002	−0.001	0.016***	0.016***	−0.005	0.009*	0.006***
ΔVOL	+	0.057***	0.026*	−0.039	0.068***	0.062***	0.003	0.088***	0.150***	0.154***	0.063***	0.073***
ΔRET	+	0.010	−0.009	−0.044	−0.036	−0.014	−0.032	−0.029	−0.018	−0.042	−0.024	−0.024
ΔMB	+	0.037***	−0.065	0.005	0.016***	0.023***	0.011**	−0.006	0.004	−0.019	0.001	0.000
ΔINST	+	0.112*	−0.017	−0.392	−0.160	−0.001	−0.048	0.078**	−0.044	0.336***	−0.015	−0.003
ISSUE	+	0.047**	0.214***	0.158***	0.182***	0.211***	0.205***	0.222***	0.167***	0.186***	0.177***	0.174***
Analyst-specific variables												
NFIRMS	+/−	0.057***	0.059***	0.058***	0.040***	0.047***	0.049***	0.055***	0.073***	0.071***	0.057***	0.056***
NFIRMS_2	+/−	−0.001***	−0.001***	−0.001***	−0.001***	−0.001***	−0.001***	−0.001***	−0.002***	−0.001***	−0.001***	−0.001***
INDUST	+	0.307***	0.293***	0.316***	0.336***	0.355***	0.393***	0.346***	0.338***	0.359***	0.338***	0.346***
RELEXP	+	−0.015	−0.032	−0.031	−0.021	−0.019	−0.018	−0.012	−0.009	−0.006	−0.018	−0.013
Brokerage house (i.e., employer) specific variables												
ΔBSIZE	+	0.004***	0.000	0.000	0.001***	0.001***	0.000	0.000	0.001**	0.001***	0.001**	0.001***
BFOLL	−	−0.385***	−0.441***	−0.401***	−0.321***	−0.377***	−0.340***	−0.358***	−0.273***	−0.270***	−0.352***	−0.318***
DEPART	+	1.460***	1.643***	1.587***	1.645***	1.781***	1.687***	1.785***	1.966***	2.585***	1.793***	1.825***
IBANK	+	0.648***	0.703***	0.696***	0.687***	0.635***	0.658***	0.629***	0.601***	0.525***	0.642***	0.634***

This table presents the results of the ordered probit analysis examining the decision to drop coverage, provide no coverage, continue coverage, or initiate coverage of the firm. Coverage is defined as providing an annual earnings forecast. The results are based on the following model:

$$CHANGE_{ijt} = \beta_0 + \beta_1 \Delta SIZE_{jt} + \beta_2 \Delta SP500_{jt} + \beta_3 \Delta FOLL_{jt} + \beta_4 \Delta VOL_{jt} + \beta_5 \Delta RET_{jt} + \beta_6 \Delta MB_{jt} + \beta_7 \Delta INST_{jt} + \beta_8 ISSUE_{jt} + \beta_9 NFIRMS_{it} + \beta_{10} NFIRMS\_2_{it} + \beta_{11} INDUST_{ijt}$$
$$+ \beta_{12} RELEXP_{ijt} + \beta_{13} \Delta BSIZE_{it} + \beta_{14} BFOLL_{it} + \beta_{15} DEPART_{ijt} + \beta_{16} IBANK_{ijt} + \rho_{ijt} \qquad (1)$$

"Avg" is the average coefficient estimates across the nine annual regressions. Pooled is the pooled regression. ***, **, * represent significance at the 1%, 5% and 10% levels, respectively, for one or two-tailed tests. For the "Avg" column, significance is based on $\bar{x}/(s/\sqrt{n})$, where $\bar{x}$ is the mean of the nine annual regression coefficients, s is their standard deviation, and n is the number of years.
All variables are defined in Appendix A.

[end of page 287]

significant, providing some evidence that an analyst is more likely to cover a firm with a greater following. ΔRET, ΔMB, and ΔINST are generally insignificant.[14]

Regarding the analyst-specific variables, NFIRMS and NFIRMS_2 are significantly positive and negative, respectively, consistent with the analyst being more likely to continue or initiate coverage as the number of firms followed increases, albeit at a decreasing rate. INDUST is also significantly positive, suggesting that the analyst is more likely to continue or initiate coverage of a firm falling in their primary industry. RELEXP is insignificant.

Of the brokerage house variables, ΔBSIZE is significantly positive, suggesting that as the analyst's resources increase, the analyst is more likely to continue or initiate coverage of a firm. BFOLL and DEPART are

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[12] Prior research reveals that most instances of multiple analysts covering the same firm at the same employing brokerage house are the result of turnover in analysts (versus analysts providing simultaneous coverage).

[13] To provide an estimate of the explanatory power of the model, we use a pseudo-R^2 measure based on Nagelkerke (1991). For the pooled sample years, the measure equals 6.6%. Within individual sample years, the power appears relatively stable, ranging from a low of 5.8% (for 1997) to a high of 9.3% (for 2002), with an average of 7.0%. We do not report other measures of model power typically reported for probit models (e.g., concordant observations) due to the disproportionate number of our sample observations that consist of firms not followed by the analyst in either year t - 1 or year t.

[14] To examine the robustness of our proxies for performance, we alternatively replace ΔRET and ΔMB with either ΔSALES (measured as the change in sales, scaled by sales from year t - 1) or ΔNI. (measured as the change in net income before extraordinary items, scaled by the absolute value of this net income for year t - 1). We also include industry-adjusted ROE in year t. All three have positive predicted signs. ΔSALES is insignificant; ΔNI is significantly positive; and industry-adjusted ROE is marginally significantly positive. These latter results provide some support consistent with McNichols and O'Brien (1997). Results on the other variables are unchanged from those reported.

significantly negative and positive, respectively, suggesting that the coverage decision is influenced by brokerage house portfolio considerations. Specifically, the negative coefficient on BFOLL indicates that the analyst is less likely to follow a firm already followed by another analyst at the same brokerage house. The positive coefficient on DEPART is consistent with analysts continuing coverage of a firm previously covered by a colleague, who has departed from the brokerage house. This suggests that the brokerage house plays a significant role in the coverage decision. Finally, IBANK is significantly positive, consistent with the analyst being more likely to continue or initiate coverage of a firm that has an investment banking relationship with the analyst's brokerage house.

Interestingly, several variables reflect significant changes over time (observed from regressing each variable's annual coefficients on a time trend). Of particular note, IBANK has a decreasing association through time, suggesting that the existence of an investment banking relationship is becoming less prominent in the coverage decision, coinciding with enactment of Regulation FD in 2000.

5. Sensitivity analyses

We perform a number of sensitivity analyses to assess the robustness of our results and provide additional insights into the associations we document. First, we examine whether variation exists in the associations we have examined. Second, we examine alternative definitions for the set of firms the analyst potentially could follow. Finally, we model the decision to follow a firm at a point in time (i.e., a levels specification) rather than as the change in a firm's position in the analyst's portfolio across time as in our current Eq. (1).

5.1. Tests for variation in observed associations

Our estimation of Eq. (1) imposes certain restrictions on the coefficients on the firm, analyst, and employer characteristics that affect the decision to follow the firm. In particular, this estimation restricts the coefficients to be the same across all analysts, across all types of employing brokerage houses, across the drop versus initiate decision, and across the size of firms considered. We sequentially relax these restrictions, and test for variation in the coefficients for the observed associations. In addition, we also investigate potential variation in response coefficients for experienced versus inexperienced analysts.

Estimation by analyst. We begin by estimating Eq. (1) by analyst to test for variation in these associations across analysts, as well as to mitigate the increase in statistical power that may arise from how we define our ''target'' firms (firms that fit the profile of covered firms but are not followed by the analyst). Accordingly, we estimate 2,090 analyst-specific regressions of Eq. (1) (i.e., one regression for each analyst in our sample), with an average of 510 observations per regression. Table 5 presents the coefficients averaged across these analyst-level regressions, the number of regressions with positive and negative coefficients, and associated t-statistics. Note that the reported coefficients and **[end of page 288]**

Table 5
Sensitivity analyses – regressions by analyst

Variable	Pred sign	Avg coefficient	# Regressions positive	# Regressions negative	t-Statistic
Intercept1	+/−	−0.588	1292	798	−0.553
Intercept2	+/−	−4.729	284	1806	−57.683***
Intercept3	+/−	−5.910	833	1257	−115.420***
Firm-specific variables					
ΔSIZE	+	0.014	1308	782	0.099
ΔSP500	+	0.226	1274	816	1.859*
ΔFOLL	+/−	0.058	1203	887	2.139*
ΔVOL	+	0.237	1370	720	2.112*
ΔRET	+	−0.023	719	1371	−0.352
ΔMB	+	−0.027	996	1094	−0.438
ΔINST	+	0.106	1028	1062	0.259
ISSUE	+	−0.361	1113	977	−2.860
Analyst-specific variables					
NFIRMS	+/−	0.022	1368	722	0.187
NFIRMS_2	+/−	−0.002	1440	650	−0.536
INDUST	+	1.115	1555	535	5.334***
RELEXP	+	−0.077	723	1367	−1.967
Brokerage house (i.e., employer) specific variables					
ΔBSIZE	+	−0.001	1483	607	−0.655
BFOLL	−	−0.926	626	1464	−5.643***
DEPART	+	1.341	1993	97	18.121***
IBANK	+	0.234	1632	458	3.144***
# of regressions run:			2090		
Average # observations/ regression			510		

This table presents the results for regressions examining the decision to drop coverage, provide no coverage, continue coverage, or initiate coverage of the firm. The regressions are estimated by analyst, with the table presenting average coefficients and the corresponding t-statistics, which use the distribution of the coefficients to test if the average is significantly different from zero. Both the average coefficient and t-statistic use the trimmed means of the analyst-level coefficients, trimmed at the 1% and 99% levels. # Regressions positive (# Regressions negative) indicates the number of analyst-level regressions in which the coefficient is positive (negative). ***, **, * represent significance at the 1%, 5% and 10% levels, respectively, for one or two-tailed tests. All variables are defined in Appendix A.

t-statistics are calculated using the trimmed-mean (at the 1% and 99% level) distribution of the coefficients from the analyst-level regressions. Of the firm-level variables, similar to the primary results of Table 4, ΔSP500, ΔFOLL, and ΔVOL are all significantly positive as predicted, but ΔSIZE and ISSUE are no longer significant. There is considerable cross-sectional variation in individual analyst coefficients for change in size, suggesting that different analysts place varying degrees of importance on size, with some probably preferring to follow small firms. Among the analyst-level variables, only INDUST is significantly positive, as predicted; NFIRMS and NFIRMS_2 have the predicted positive and negative signs, respectively, but are now insignificant. Among the employer-level variables, BFOLL, DEPART, and IBANK are significantly negative, positive, and positive, respectively, as predicted. In contrast to the primary analysis, ΔBSIZE is not significant, probably because this is estimated by analyst thereby sacrificing variation along this dimension. These regressions indicate that the average relationship holds across individual analysts; that the results are not driven by the statistical power arising from our test; and that substantial variation in these associations occurs across analysts (as reflected in the regressions having positive versus negative response coefficients).

Estimation by type of employing brokerage house. Evidence from Cowen et al. (2006) suggests that analyst incentives vary, in part, due to the type of employer. As discussed previously, there are four types of brokerage houses: full-service investment banks, non-underwriter (or syndicate) banks, pure brokerage firms, and research firms. Because analysts' incentives to cover a given firm can vary across these employers, we separately estimate Eq. (1) by each of the four types of brokerage houses. Based on these classifications, the available sample includes 689,123 observations for full-service investment banks, 112,586 for syndicate banks, 29,665 for brokerage firms, and 4,253 for research firms. Untabulated results reveal that the coefficients are unchanged from our primary specification and **[end of page 289]** are similar across these employer types, with the following exception: the coefficients on both INDUST and DEPART are largest for research firms (both by a factor of two), suggesting that industry specialization and continuity of coverage play a bigger in role the decision to follow a firm for research firms relative to other types of firms. Further, the findings of Cowen et al. (2006) suggest that trading volume should figure most prominently for analysts at pure brokerage firms; however, we find that the coefficient on ΔVOL for brokerage firms does not differ from the other types of firms. Finally, we estimate Eq. (1) by analyst and group the coefficients by employer type. Results reveal that variation across analysts occurs even within types of brokerage houses, consistent with analysts applying individual preferences with regards to the firms that are followed.

Drop coverage versus initiate coverage. Next, we examine whether the associations vary across the decision to drop coverage versus the decision to initiate coverage, which may be inherently different decisions (e.g., McNichols and O'Brien, 1997, 2000). We begin by estimating a regression to examine the decision to drop coverage. The starting point is all observations where the analyst follows the firm in year $t - 1$. If the analyst continues to follow the firm in year t, the dependent variable is equal to 1; if the analyst drops coverage of the firm in year t, the dependent variable is equal to 0. The average N across the nine sample years is 5472. Untabulated results are unchanged from those presented in Table 4, except that ΔSP500 and INDUST are now insignificant and ΔINST is now significant. We then estimate a regression to examine the decision to initiate coverage. The starting point is all observations where the analyst does not follow the firm in year $t - 1$. If the analyst also does not provide coverage in year t, the dependent variable is equal to 0; if the analyst initiates coverage in year t, the dependent variable is equal to 1. The average N across the nine sample years is 112,977. Untabulated results are similar to those of Table 4, except that neither ΔSP500 nor ΔFOLL is significant. Comparing results across the two regressions, the following differences are noted. The coefficients on ΔINST, NFIRMS, and NFIRMS_2 are all larger in the drop coverage specification, suggesting that changes in institutional ownership and workload figure more prominently in assessing whether to drop (versus initiate) coverage on a particular firm. In contrast, the coefficients on ΔVOL, ISSUE, INDUST, and IBANK are all larger in the initiate coverage specification, suggesting that trading volume changes, security issuances, industry specialization, and investment banking relationships figure more prominently in the decision to initiate coverage.

Large versus small firms. In Section 2.2, we indicated that there may be little discretion over the decision to follow very large firms (i.e., these are the ''maintenance'' or ''must have'' firms). We now separately examine firms in the S&P 500 (''large'' firms) and firms not in the S&P 500 (''small'' firms), consistent with anecdotal evidence that membership in a key index such as the S&P 500 often determines whether a firm is a ''must have''. Untabulated results reveal similar coefficients and significance levels across these two subsamples with the following exceptions. First, ΔFOLL, ΔVOL, and IBANK all appear to play larger roles in the decision to follow small firms relative to large firms, consistent with increasing interest by other analysts, increases in trading volume, and an investment banking relationship figuring more prominently in the decision to follow smaller firms. In contrast, INDUST and RELEXP figure more prominently in the decision to follow large firms relative to small firms, suggesting that for large and likely heavily followed firms, analysts focus more on their relative advantage in terms of industry specialization or being more experienced than competing analysts.

Experienced versus inexperienced analysts. Finally, we examine whether the associations vary depending on the analyst's level of experience. As stated earlier, our primary sample includes only those analysts with 5 or more years of experience. We now benchmark these associations to those for analysts with less than 5 years of experience, who presumably have less influence over the firms they follow. Table 6 presents the results, revealing that most associations are similar across the two groupings of analysts albeit with several notable exceptions. Most interestingly, RELEXP is positive and significant as predicted for less experienced analysts, consistent with relative experience being a more prominent factor across a greater variety of firms for less experienced versus more experienced analysts. In addition, there is some evidence that experienced analysts place greater weightings on ΔSP500, ISSUE, INDUST, and IBANK. This is consistent with experienced analysts either choosing to cover or being assigned to cover firms that are in the S&P 500, that have issued securities, that fall within their primary industry of expertise, and that have investment banking relationships with the analysts' brokerage houses. **[end of page 290]**

Table 6
Sensitivity analyses – regressions comparing experienced versus inexperienced analysts

Variable	Pred sign	Experienced analysts (average annual N = 118,449)			Inexperienced analysts (average annual N = 55,100)		
		Avg coeff	t-Statistic	# Years significant	Avg coeff	t-Statistic	# Years significant
Intercept1	+/−	1.857	63.345**	9	2.020	31.618**	9
Intercept2	+/−	−4.302	−112.430**	9	−4.476	−93.776**	9
Intercept3	+/−	−5.244	−142.471**	9	−5.240	−130.139**	9
Firm-specific variables							
ΔSIZE	+	0.070	1.989**	6	0.110	3.807**	8
ΔSP500	+	0.247	4.754**	8	0.186	2.696**	7
ΔFOLL	+/−	0.009	1.438*	4	0.015	3.363**	8
ΔVOL	+	0.063	3.001**	7	0.075	3.381**	6
ΔRET	+	−0.024	−4.015	0	−0.022	−7.357	0
ΔMB	+	0.001	0.069	4	−0.022	−2.932	0
ΔINST	+	−0.015	−0.228	3	−0.063	−0.863	2
ISSUE	+	0.177	9.953**	9	0.116	5.467**	8
Analyst-specific variables							
NFIRMS	+/−	0.057	16.225**	9	0.059	9.925**	9
NFIRMS_2	+/−	−0.001	−8.300**	9	−0.001	−6.360**	9
INDUST	+	0.338	33.427**	9	0.266	14.207**	9
RELEXP	+	−0.018	−5.948	0	0.018	2.573**	6
Brokerage house (i.e., employer) variables							
ΔBSIZE	+	0.001	1.900**	5	0.001	1.868**	6
BFOLL	−	−0.352	−18.460**	9	−0.281	−15.391**	9
DEPART	+	1.793	16.347**	9	1.880	20.556**	9
IBANK	+	0.642	34.835**	9	0.453	10.243**	8

This table presents the results of regressions examining the decision to follow a firm across experienced versus inexperienced analysts. Experienced (inexperienced) analysts are defined as those having five or more (four or less) years of general experience (i.e., issuing any forecasts per IBES). Note that the results reported above for experienced analysts are the same as those reported in Table 4 (see the "Avg" column); they are provided above for expositional convenience. Avg coeff is the average of the coefficients across the nine annual regressions. The reported t-statistic is based on $\bar{x}/(s/\sqrt{n})$, where $\bar{x}$ is the mean of the 10 annual regression coefficients, s is their standard deviation, and n is the number of years. # Years Significant is the number of annual regressions in which the coefficient is significant using one or two-tailed tests, as indicated.

5.2. Alternative Definitions for Target Firms

Our primary analyses define the population of ''target'' firms (again, firms that the analyst could potentially follow but does not issue a forecast for) to include all firms falling within each four-digit industry grouping per I/B/E/S for which the analyst issues a forecast in year t - 1. This definition results in an average of 166 potential target firms per analyst (see Table 1).[15]15 To examine the robustness of our results, we now explore alternative definitions for target firms.

We first define the population of target firms to include only those firms in the analyst's *primary* SIG code (per I/B/E/S) followed in year t - 1. Not surprisingly, this substantially reduces the number of observations to approximately 20 (versus the 166 indicated in Table 1). Untabulated results are generally unchanged for our primary analysis (Table 4), our analysis by analyst (Table 5), and our separate examination of the drop versus initiate decision.

We also redefine the sample of target firms to correspond to the number of firms actually followed by the analyst. Accordingly, we match each firm for which the analyst issues a forecast with a firm selected from the firms not covered in the industries that the analyst covered in the previous year. As expected, the average number of observations drops substantially, to an average of 5203 per year. Results are consistent with the primary analysis, except that NFIRMS, NFIRMS_2, and BSIZE are now **[end of page 291]** insignificant. Overall, the latter analyses suggest that our results are robust to alternative definitions of target firms.

5.3. Levels specification

Our Eq. (1) is specified as a changes model in that we examine how a particular firm's status in the analyst's portfolio of firms followed changes across time. We alternatively model this in a levels specification with the dependent variable representing whether or not analyst i follows firm j in year t. The independent variables are similar to Eq. (1), with definitions adjusted slightly to correspond to the levels specification. Untabulated results are similar to those presented in Table 4 for the changes specification, suggesting that the associations we document are consistent across both changes and levels specifications.

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[15] Restated, our initial definition of ''target'' firms may overstate the set of firms the analyst would reasonably consider, leading to potential bias in only one value of our dependent variable (where CHANGE = - 1).

6. Conclusion

Prior literature examines the determinants of the number of analysts following a firm from a firm-level perspective – that is, based on characteristics of the covered firm. In contrast, we adopt an analyst/ brokerage house perspective and examine various analyst and brokerage house characteristics that may also affect the decision to follow a firm. We document that characteristics specific to the covered firm, the individual analyst, and the employing brokerage house are all associated with the analyst's decision to follow a firm. Consistent with results in prior studies that focus on covered firms rather than analysts, we find that analysts follow firms that are growing, have issued debt or equity in the prior year, and have increasing trading volume. In addition, we document that an analyst is more likely to follow a firm falling within his or her primary industry of expertise and, in certain contexts, when the analyst has greater experience relative to other analysts following that firm. Further, we find that continuity of coverage by the brokerage house and whether the brokerage house has an investment banking relationship with the firm affect the coverage decision. Finally, we find substantial variation in these associations, suggesting that analyst-firm pairings arise from richer circumstances than the average firm-level relationships documented by prior research.

Our research design is intended to focus on analysts most likely to have decision rights with regard to which firms to follow. To the extent that our design is successful, our results may be interpreted as modeling a process whereby individual analysts consider characteristics of the covered firm, their employing brokerage house, and their own individual capacities in how to construct their portfolio of covered firms. However, it is also possible that some or all of the decision rights reside with the employing brokerage house; in this case, our findings suggest that it is the employer that takes these factors into consideration when assigning analyst-firm pairings. Under either interpretation, our results are likely of interest to managers, regulators, and investors in that they improve our understanding of how analysts follow firms, which aids in understanding the qualities of the outputs generated by this important group of information intermediaries. Future research may consider the consequences of a non-random pairing of analysts and firms.

Appendix A

Variable definitions
Dependent variable:

$CHANGE_{ijt}$	discrete variable equal to -1 if analyst i follows firm j (i.e., issues an annual earnings forecast for) in year $t-1$ but not in year t (i.e., drops coverage); 0 if analyst i does not follow firm j in years $t-1$ or t (i.e., provides no coverage); 1 if analyst i follows firm j in both years $t-1$ and t (i.e., continues coverage); and 2 if analyst i does not follow firm j in year $t-1$ but does in year t (i.e., initiates coverage)

Firm-specific variables:

$\Delta SIZE_{jt}$	change in the log of market value of firm j from year $t-1$ to year t
$\Delta SP500_{jt}$	change in the indicator variable for inclusion in the S&P 500 index for firm j from year t to year $t-1$ (i.e., equals -1 if the firm was in the index in year $t-1$, but not in t; equals 0 if the firm remained in or out of the index for both years t and $t-1$; and equals 1 if the firm was in the index in year t, but not $t-1$)
$\Delta FOLL_{jt}$	change in the number of analysts following firm j from year $t-1$ to year t
ΔVOL_{jt}	change in the log of annual trading volume for firm j from year $t-1$ to year t
ΔRET_{jt}	change in firm j's annual stock return from year $t-1$ to year t
ΔMB_{jt}	change in firm j's market-to-book ratio from year $t-1$ to year t
$\Delta INST_{jt}$	change in the percentage of firm j's common shares owned by institutions from year $t-1$ to year t
$ISSUE_{jt}$	indicator variable equal to 1 if firm j issues debt or equity in year $t-1$, and 0 otherwise

Analyst-specific variables:

$NFIRMS_{it}$	number of firms followed by analyst i in year t
$NFIRMS\_2_{it}$	square of the number of firms followed by analyst i in year t
$INDUST_{ijt}$	indicator variable equal to 1 if firm j is in the primary industry followed by analyst i in year $t-1$, and 0 otherwise
$RELEXP_{ijt}$	general experience of analyst i less the average general experience for all analysts forecasting for firm j in year t, where general experience is measured as the number of years the analyst has forecasted on the I/B/E/S database

Brokerage house (i.e., employer) specific variables:

$\Delta BSIZE_{it}$	change in the size of the brokerage house employing analyst i from year $t-1$ to year t
$BFOLL_{ijt}$	indicator variable equal to 1 if firm j is followed in year t by another analyst employed by the same brokerage house employing analyst i in year t, and 0 otherwise
$DEPART_{ijt}$	indicator variable equal to 1 if firm j is followed in year $t-1$ by another analyst employed by the same brokerage house employing analyst i and this other analyst is no longer forecasting for the same brokerage house in year t, and 0 otherwise
$IBANK_{ijt}$	indicator variable equal to 1 if analyst i is employed by a brokerage house, which is an underwriter on any investment banking deals (i.e., stock/bond issuances, and merger or acquisition activity) for firm j during years t, $t-1$, or $t-2$, and 0 otherwise

References

Barth, M., Kasznik, R., McNichols, M., 2001. Analyst coverage and intangible assets. Journal of Accounting Research 39, 1–34.

Bhushan, R., 1989. Firm characteristics and analyst following. Journal of Accounting and Economics 11, 285–303.
[end of page 293]

Clarke, J., Khorana, A., Patel, A., Rau, P.R., in press. The impact of all-star analyst job changes on their coverage choices and investment banking deal flow. Journal of Financial Economics.

Clement, M., 1999. Analyst forecast accuracy: Do ability, resources, and portfolio complexity matter? Journal of Accounting and Economics 27, 285–303.

Cowen, A., Groysberg, B., Healy, P., 2006. Which types of analyst firms are more optimistic? Journal of Accounting and Economics 41, 119–146.

Hayes, R., 1998. The impact of trading commission incentives on analysts' stock coverage decisions and earnings forecasts. Journal of Accounting Research 36 (3), 299–320.

Hong, H., Kubik, J.D., Solomon, A., 2000. Security analysts' career concerns and herding of earnings forecasts. Rand Journal of Economics 31, 121–144.

Irvine, P., 2001. Do analysts generate trade for their firms? Evidence from the Toronto stock exchange. Journal of Accounting and Economics 30, 209–226.

Jacob, J., Lys, T., Neale, M., 1999. Expertise in forecasting performance of security analysts. Journal of Accounting and Economics 28, 51–82.

Lang, M., Lundholm, R., 1996. Corporate disclosure policy and analyst behavior. The Accounting Review 71 (4), 467–492.

McNichols, M., O'Brien, P., 1997. Self-selection and analyst coverage. Journal of Accounting Research 35 (3), 167–199.

McNichols, M., O'Brien, P., 2000. Inertia and discreteness: Issues in modeling analyst coverage. Working Paper, Stanford University and University of Waterloo.

Michaely, R., Womack, K., 1999. Conflict of interest and the credibility of underwriter analyst recommendations. The Review of Financial Studies 12 (4), 653–686.

Mikhail, M., Walther, B., Willis, R., 1999. Does forecast accuracy matter to security analysts? The Accounting Review 74 (2), 185–200.

Nagelkerke, N., 1991. A note on a general definition of the coefficient of determination. Biometrika 78, 691–692.

O'Brien, P., Bhushan, R., 1990. Analyst following and institutional ownership. Journal of Accounting Research 28, 55–76.

Schipper, K., 1991. Commentary: Analysts' forecasts. Accounting Horizons (4), 105–121. **[end of page 294]**