Analyst Characteristics and the Timing of Forecast Revision

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January 2009

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Acknowledgements: Kim acknowledges financial support provided by the Leavey Research Grant and the Accounting Development Fund at Santa Clara University.

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Abstract

Forecast timing is an important decision for sell-side analysts. One the one hand, timely forecasts can benefit brokerage firms through triggering larger trading and by increasing commission fees. On the other hand, earlier forecasts may sacrifice forecast accuracy. We focus on analyst characteristics that proxy for forecast ability as determinants of analyst forecast revision timing. This paper examines the relation between analyst characteristics and their timing of forecast revisions, as well as its impact on the relative accuracy and price impact of forecast revisions. We find that analysts with more firm-specific and general experience and more accurate prior period forecasts, who are affiliated with larger brokers and follow fewer industries (all of which are positively correlated with analyst's presumed ability) tend to forecast later in the quarter. We also find that analyst characteristics are associated with an improvement in accuracy from a revised forecast over the consensus forecast and return sensitivity to forecast revisions. However, the negative association between relative forecast error and revision timing, and the temporal trend of return sensitivity to forecast revisions over event time documented in Ivković and Jegadeesh (2004) do not change, even after the effect of analyst characteristics on relative forecast error and return sensitivity are controlled for.

Keywords: earnings forecast; forecast revision; analyst characteristics; forecast timing; forecast error; security returns

Analyst Characteristics and the Timing of Forecast Revision

I. Introduction

This paper examines the relation between analyst characteristics and their timing of forecast revisions. We also examine the relation between analyst characteristics that proxy for analyst forecast ability and the relative accuracy and price impact of forecast revisions over event time. Though prior research examines analyst characteristics and forecast accuracy (e.g., Clement 1999) and its impact on investors' response to analyst forecast revisions (e.g., Clement and Tse 2003), to our knowledge, no research focuses on the relation between analyst characteristics and forecast revision timing. We attempt to fill the void.

Forecast timing is important decision for analysts. One the one hand, a timely forecast can benefit brokerage firms through triggering larger trading and increasing commission fees, which ultimately benefit analysts (e.g., Cooper, Day, and Lewis 2001; Irvine 2003; Jackson 2005). On the other hand, earlier forecasts may sacrifice forecast accuracy by reducing opportunities for the analyst to observe other analysts' forecasts and their private information. Less accurate forecasts are a concern to analysts because forecast accuracy is an important determinant for analysts' career success (Stickel 1992; Hong, Kubik, and Solomon 2000; Hong and Kubik 2003). Frequent forecast revisions cannot solve this trade-off problem between timeliness and accuracy of analyst forecasts because frequent forecast revisions may harm an analyst's reputation by sending market participants a negative signal that the analyst's prior information is less accurate (Trueman 1990). As a result, analysts decide the timing of their forecasts considering costs and benefits. We argue that this timing decision is associated with several analyst characteristics that proxy for analysts' forecast ability.

Research that examines the relation between analyst characteristics and forecast revision timing is interesting and important for several reasons. First, given that analysts' forecasts are used as a proxy for investors' expectation of earnings in finance and accounting research, it is important to know whether there exist non-trivial differences in properties of forecasts and forecast revisions issued at different points

during the fiscal period and what factors contribute to the timing of forecasts and forecast revisions. Second, in light of recent literature that examines the timing and value of forecasts (Ivković and Jegadeesh 2004), an examination of the relation between analyst characteristics and the timing of forecast revisions would help us understand whether changes in accuracy and information content of revisions are the results of different types of analysts forecasting at different points over the event time.

Ivković and Jegadeesh (2004) examine the timing of analyst forecast revisions and the relation between revision timing and information content of revisions. They posit that the sources of value contained in analysts' earnings forecasts come from analysts' skill at interpreting public information and/or their ability to collect and process private information. They find that the relative precision of and market reaction to analyst forecasts are lower immediately after the prior quarter earnings announcement, and greater before the current quarter earnings announcement. They conclude that the value of analysts' forecasts primarily comes from analysts' ability to collect and process private information.

Timing of forecasts and their value might differ across financial analysts with different levels of forecast ability. For example, analysts who have less firm-specific experience may have to rely heavily on public information, such as earnings announcements, while analysts with more firm-specific experience would rely less on public information because they may have better access to management and private information. An investigation of the relation between forecast timing and analyst characteristics will provide a better understanding of the various roles played by analysts with different characteristics.

Using a sample of forecast revisions over a 16-year period between 1990 and 2005, we find that analyst characteristics are significantly related to the timing of analysts' forecast revisions. Specifically, we find that analysts with more firm-specific experience, more general experience, and more accurate prior period forecasts; those employed by larger brokerage firms; and those following fewer industries (all of which are positively correlated with presumed analyst's ability) tend to forecast later in the quarter. That analysts with greater forecasting ability forecast during the pre-announcement period of the current quarter earnings is consistent with Ivković and Jegadeesh's (2004) argument that the value of analysts' earnings forecasts stems from analysts' ability to collect and process private information rather than

interpreting public information. We also find that the negative association between relative forecast error and revision timing, and the temporal trend of return sensitivity to forecast revisions over event time, do not change even when analyst characteristics are controlled for.

The remainder of the paper is organized as follows. Section II provides a review of literature on the timing of analysts' forecasts and analyst characteristics. We discuss the sample and outline the research design in Section III. Section IV presents the empirical results, and the final section summarizes our conclusions.

II. Prior Literature and Research Issues

II. 1. Timing of analyst forecasts and forecast revisions

While the literature on analysts' forecasts in areas such as the accuracy and other statistical properties of the forecasts, informativeness of the forecasts, and analysts' economic incentives are abundant, very little attention has been given to the timing of analysts' forecasts and factors associated with this timing. Stickel (1989) shows that security analysts tend to avoid revising forecasts for two weeks before an interim earnings announcement and revise immediately after the announcement. However, he does not examine the incentives and determinants of this timing.

Cooper et al. (2001) focus on the timing of forecasts and security analysts' performance. They find that lead analysts, identified by their measure of forecast timeliness, have a greater impact on stock prices than follower analysts. Ivković and Jegadeesh (2004) find that the relative precision of and market reaction to analyst forecasts are smaller immediately after the prior period earnings announcement, but larger before the current period earnings announcement. While these two studies examine the association between the timing of analysts' forecasts and such *forecast* characteristics as accuracy and price impact, *analyst* characteristics may affect both timing and forecast characteristics.

O'Brien, McNichols, and Lin (2005) provide evidence that analysts' investment banking affiliations influence timeliness in downgrading their recommendations. In his analytic model, Guttman (2008) considers a situation in which analysts determine the timing of their forecasts in a way that

maximizes their payoffs. At the beginning of the forecasting period, investors obtain initial public information, and each analyst obtains his initial private information about the forthcoming earnings. As time goes by, more public and private information arrives to the market, which increases the precision of both public information and the analysts' private information. In the model, analysts face a trade-off between timeliness and the precision of their forecasts. One implication of his model is that, all else being equal, analysts with more precise initial private information tend to forecast earlier, and analysts with higher learning ability tend to forecast later.

In this study, we examine individual analysts' decisions to revise their forecasts at a certain point (relative to the previous and current quarterly earnings announcements) during the fiscal quarter and the impact of various analyst characteristics on the revision timing. We also examine whether previously documented relations among revision timing, relative accuracy, and the price impact of forecast revisions are intact after considering the different timings of revisions made by analysts with different characteristics.

II. 2. Analyst characteristics

Clement (1999) finds that forecast accuracy increases with experience (a surrogate for ability) and employer size (a surrogate for resources), and decreases with the number of firms and industries followed (surrogates for portfolio complexity). Jacob, Lys, and Neale (1999) find that the number of companies followed by an analyst is negatively associated with forecast accuracy. They also find that forecast frequency, broker-industry specialization, and brokerage firm size are associated with higher forecast accuracy, while outgoing broker-analyst turnover is associated with lower forecast accuracy. Mikhail, Walther, and Willis (1997) show that analysts generate more accurate earnings forecasts and more profitable stock recommendations as their firm-specific experience increases. Brown (2001) finds that observed analyst characteristics have a predictive power for forecast accuracy. Clement and Tse (2003) examine whether investors appear to extract all of the information that analyst characteristics provide about forecast accuracy. They show that while various analyst characteristics are associated with

forecast accuracy, investors' responses to forecast revisions are influenced by characteristics other than forecast accuracy.

Clement and Tse (2003) include the forecast horizon (days from the forecast date to the fiscal year-end) as a control variable in their forecast accuracy and price reaction regressions. This study differs from Clement and Tse because we focus on the timing of forecast revisions as well as the determinants of this timing. We also examine whether the relation between timing and forecast accuracy, as well as the price impact of the revision, change when we control for analyst characteristics. In addition, we use the relative forecast error developed by Ivković and Jegadeesh (2004) as opposed to the forecast error rank used in Clement and Tse (2003). Analyst forecasts are more accurate later in the quarter regardless of the analysts' ability because more information is available as the fiscal-quarter end approaches. The relative forecast error is calculated as the difference between the forecast error for the newly released forecast and the forecast error for the consensus forecast on the day before the forecast revision. This measure is much less affected by the mechanical increase in forecast accuracy over time, and reflects incremental information content of the revision beyond consensus forecast. Thus, it is better suited for testing the impact of analyst characteristics on the relation between forecast error and the timing of forecast revisions. We also focus on forecast revisions for quarterly earnings as opposed to forecast revisions for annual earnings in Clement and Tse (2003).[1] We focus on quarterly forecasts because analysts more frequently revise their forecasts for annual earnings and therefore the timing of forecast revisions is a less critical decision for annual earnings.

Hong et al. (2000) show that inexperienced analysts are more likely to be terminated for inaccurate earnings forecasts than are their more experienced counterparts. Controlling for forecast accuracy, inexperienced analysts are also more likely to be terminated for bold forecasts that deviate from the consensus. Consistent with these implicit incentives, they find that inexperienced analysts deviate less

[1] Using the last annual forecast for each analyst, Clement and Tse (2003) find that forecasts later in the year are more accurate but have less price impact. Using quarterly earnings forecasts, but without considering the effect of analyst characteristics, Ivković and Jegadeesh (2004) show that both forecast accuracy and the information content of revisions increase over event time.

from consensus forecasts. Clement and Tse (2005) extend Hong et al. and show that not only experience, but also other analyst characteristics that proxy for analysts' self-assessed ability explain forecast boldness.

Although the relations among forecast accuracy, analysts' herding, and various analyst characteristics are well documented in the literature, prior research does not examine analyst characteristics as determinants of the timing of forecast revisions. To our knowledge, our study is one of the first to examine analyst characteristics as determinants of the timing of forecast revisions and thus extends this line of literature.

Clement and Tse (2003) finds that analyst characteristics that proxy for analysts' self-assessed ability are associated with forecast accuracy. Ivković and Jegadeesh (2004) find that the relative precision of analyst forecasts is smaller immediately after the prior quarter earnings announcement, but larger before the current quarter earnings announcement. Based on evidence in prior literature, we expect that analysts with characteristics that proxy for superior (inferior) ability issue forecasts during the pre (post) announcement period.[2] However, it is also possible that analysts forecast during different time periods depending on their competitive advantages in interpreting public information and/or accessing and processing private information.

III. Research Design

III. 1. Sample selection

We obtain data on sell-side analysts' earnings forecasts for the period between January 1990 and August 2005 from Institutional Brokers' Estimate System (I/B/E/S) detail tape. We focus on one-quarter-ahead EPS forecasts revised since the prior quarter (*q-1*) earnings announcement date.[3] We obtain the

[2] The pre-announcement period refers to the period prior to the quarter *q* earnings announcement, and the post-announcement period refers to the period following the quarter *q-1* earnings announcement, where quarter *q* is the quarter for which earnings are being forecasted. Details for the event time are discussed in subsection III. 3.

[3] When an analyst releases the first forecast prior to the *q-1* earnings announcement but no earlier than the *q-2* announcement and issues forecasts after the *q-1* announcement, we regard all forecasts after the *q-1* announcement

earnings announcement dates from COMPUSTAT quarterly files and the stock return data from the Center for Research in Security Prices (CRSP) database. We require analysts to follow the firm for at least one quarter prior to the current quarter so that we can calculate the analysts' forecast accuracy in the prior quarter. We also require at least two analysts following the firm on the day before the forecast revision so that we can determine a consensus forecast prior to the revision. These procedures yield a sample of 344,921 quarterly earnings forecast revisions, of which 145,706 are upward revisions and 199,215 are downward revisions. The larger frequency of downward revisions than upward revisions is consistent with analysts' optimism bias documented in prior literature (O'Brien 1988; Klein 1990) as well as the findings of Ivković and Jegadeesh (2004). We retain the first revision for each analyst, leaving 242,670 quarterly forecast revisions, of which 104,633 are upward revisions and 138,037 are downward revisions. The number of observations in each analysis may vary depending on availability of analyst characteristics and control variables.

III. 2. Analyst characteristics

Clement and Tse (2003; 2005) provide a comprehensive set of analyst characteristics. To allow comparisons of regression model coefficients, we scale each variable to range from 0 to 1 using a transformation that preserves the relative distances among each characteristic's measures for firm *j* in quarter *q*. The scaled analyst characteristic variables, except for prior forecast accuracy, for analyst *i* take the form

$$Characteristic_{ijq} = \frac{Raw\_Characteristic_{ijq} - Raw\_Characteristic\min_{jq}}{Raw\_Characteristic\max_{jq} - Raw\_Characteristic\min_{jq}} \quad (1)$$

as revisions and include them in the sample. When an analyst issues the first forecast after the *q-1* announcement and revises later, we include only the revision (the second forecast) in our sample.

To ensure that the forecast accuracy variable increases with the higher value of the measure (0 for the least accurate forecast and 1 for the most accurate forecast), the scaled prior forecast accuracy variable for analyst *i* takes the form

$$Prior\_Accuracy_{ijq} = \frac{prior\ forecast\ error \max_{jq} - prior\ forecast\ error_{ijq}}{prior\ forecast\ error \max_{jq} - prior\ forecast\ error \min_{jq}} \quad (2)$$

Following Clement and Tse (2003; 2005), we use six characteristics of individual analysts:

$FirmEXP_{ijq}$ = a measure of analyst *i*'s firm-specific experience. It is calculated as the number of quarters of firm-specific experience for analyst *i* following firm *j* in quarter *q* minus the minimum number of quarters of firm-specific experience for analysts following firm *j* in quarter *q*, with this difference scaled by the range of firm-specific experience for analysts following firm *j* in quarter *q*;

$GenEXP_{ijq}$ = a measure of analyst *i*'s career experience. It is calculated as the number of quarters of career experience for analyst *i* following firm *j* in quarter *q* minus the minimum number of quarters of career experience for analysts following firm *j* in quarter *q*, with this difference scaled by the range of career experience for analysts following firm *j* in quarter *q*;

$Industries_{ijq}$ = a measure of the number of industries analyst *i* follows during the year. It is calculated as the number of two-digit SICs followed during the year by analyst *i* following firm *j* in quarter *q* minus the minimum number of two-digit SICs followed during the year by analysts who follow firm *j* in quarter *q*, with this difference scaled by the range of the number of two-digit SICs followed during the year by analysts following firm *j* in quarter *q*;

$Prior\_Accuracy_{ijq}$ = a measure of analyst *i*'s prior forecast error for firm *j*. It is calculated as the maximum absolute forecast error for quarter *q-1* EPS by analysts who follow firm *j* in quarter *q* minus the absolute forecast error for quarter *q-1* EPS by analyst *i* following firm *j* in quarter *q*, with this difference scaled by the range of absolute forecast errors for quarter *q-1* EPS by analysts

following firm *j* in quarter *q*. The absolute forecast errors are calculated with each analyst's last forecast of quarter *q-1* EPS;

$Broker\_Size_{ijq}$ = a measure of the analyst's brokerage firm size. It is calculated as the number of analysts employed during the year by the brokerage firm employing analyst *i* following firm *j* in quarter *q* minus the minimum number of analysts employed during the year by the brokerage firm for analysts following firm *j* in quarter *q*, with this difference scaled by the range of brokerage firm sizes for analysts following firm *j* in quarter *q*; and

$Companies_{ijq}$ = a measure of the number of companies analyst *i* follows during the year. It is calculated as the number of companies followed during the year by analyst *i* following firm *j* in quarter *q* minus the minimum number of companies followed during the year by analysts who follow firm *j* in quarter *q*, with this difference scaled by the range of the number of companies followed during the year by analysts following firm *j* in quarter *q*.

III. 3. Analyst characteristics and the timing of forecast revisions

To examine the relation between analyst characteristics and the timing of forecast revisions, we employ both continuous and discrete timing variables. *RT* is a continuous variable of revision timing and a natural log of the number of days since the quarter *q-1* earnings announcement date. We also use the discrete event time variables representing five periods relative to the prior and the current quarter earnings announcements. The timing of analysts' forecast revisions is measured relative to the quarter *q-1* and quarter *q* earnings announcement dates. For each individual analyst's revision of the one-quarter-ahead earnings forecast, we determine the number of trading days between the revision date and the earnings announcement date. For revisions made at or prior to the mid-point of the quarter, revision timing is measured relative to the prior quarter, *q-1,* earnings announcement (trading days 0 through 32), and for revisions made after the mid-point of the quarter, the timing is measured relative to the current quarter, *q,* earnings announcement (trading days -30 through -1). These trading days cover the entire quarter.

The timing of forecast revisions is then grouped into five periods as follows:

Period 1: days (0, 1) (announcement period of quarter *q-1* earnings)

Period 2: days (2, 6) (immediate post-announcement period of quarter *q-1* earnings)

Period 3: days (7, 32) (non-immediate post-announcement period of quarter *q-1* earnings)

Period 4: days (-30, -6) (non-immediate pre-announcement period of quarter *q* earnings)

Period 5: days (-5, -1) (immediate pre-announcement period of quarter *q* earnings)

where quarter *q* is the quarter for which earnings are being forecasted. Our definitions of the timing and the periods closely follow those in Ivković and Jegadeesh (2004) and therefore make comparing the results of the two studies easy. We call Periods 2 and 3 together post-announcement periods, and Periods 4 and 5 together pre-announcement periods.

When examining the return sensitivity to earnings forecast revisions discussed in subsection III. 5., following Ivković and Jegadeesh (2004), we classify revision timing into three different periods: D1 (days (7, 32) and days (-30, -6)), D2 (days (-5, -1)), and D3 (days (2, 6)).

Utilizing a continuous revision timing variable, *RT*, we establish the following regression equation:

$$RT = a0 + a1*FirmEXP + a2*GenEXP + a3*Industries + a4*Prior\_Accuracy + a5*Broker\_Size + a6*Companies + Control\ variables \quad (3)$$

where variables are defined earlier. For the multivariate tests, we exclude sample revisions in *Period 1* (days (0, 1)) to maintain consistency with Ivković and Jegadeesh (2004).

We also use logit models to examine the determinants of issuing forecast revisions in one of four periods (*Periods 2, 3, 4*, and *5*):

$$Pr(Period\ 2=1 \text{ or } Period\ 3=1 \text{ or } Period\ 4=1 \text{ or } Period\ 5=1) = F(a0 + a1*FirmEXP + a2*GenEXP + a3*Industries + a4*Prior\_Accuracy + a5*Broker\_Size + a6*Companies + Control\ variables) \quad (4)$$

III. 4. Analyst characteristics and the relative, current forecast error

Ivković and Jegadeesh (2004) show that the relative current forecast error is associated with forecast revision timing. If analyst characteristics are likely to be determinants of forecast revision timing, it is of interest to examine whether the improvement of forecast error over the event time documented in Ivković and Jegadeesh (2004) is caused by having analysts with different characteristics forecasting in different periods.

The relative forecast error, *RFE*, is the difference between the forecast errors for the newly released one-quarter-ahead earnings forecast and the forecast error for the consensus forecast one day before the forecast revision. The consensus forecast summarizes the information available to all analysts prior to the forecast revision, whereas the new forecast conveys the incremental information upon which the analyst revises her/his forecast. Specifically, for every new earnings forecast made by analyst *i* for stock *j* at time *t*, we define the relative current forecast error RFE_{ijt} as follows:

$$RFE_{ijt} = FE_{ijt} - CFE_{jt-1} \tag{5}$$

where: $FE_{ijt} = 100 \times Abs[(analyst\_forecast_{ijt} - quarterly\_earnings_j) / quarterly\_earnings_j]$ (6)

and $CFE_{ijt} = 100 \times Abs[(consensus\_forecast_{ijt} - quarterly\_earnings_j) / quarterly\_earnings_j]$ (7)

Following Ivković and Jegadeesh (2004), we truncate both FE_{ijt} and CFE_{jt-1} at 100%. We compute the consensus forecast one day before forecast revision (CFE_{jt-1}) as the arithmetic average of each analyst's last forecast since the quarter *q-1* earnings announcement date. Under this definition, *RFE* is undefined around event day 0 because we cannot compute *CFE* for event day 0. In addition, *RFE* on day 1 or 2 is unavailable unless at least two analysts issue forecasts on day 0 or 1. To overcome these problems, *CFE*s for the event days 0 and 1 are computed including two-quarter-ahead forecasts (i.e., forecasts issued before the quarter *q-1* earnings announcement date). The relative, current forecast error is negative when the analyst's revised forecast is more accurate than the consensus forecast and is positive otherwise.

We employ two regression models, one with continuous event-time variables and the other with discrete event-time variables, to examine the association between the relative forecast error and the timing of forecast revisions, as well as analyst characteristics.

$$RFE = a0 + a1*RT + a2*FirmEXP + a3*GenEXP + a4*Industries + a5*Prior\_Accuracy + a6*Broker\_Size + a7*Companies + Control\ variables \quad (8)$$

$$RFE = a1*Period2 + a2*Period3 + a3*Period4 + a4*Period5 + a5*FirmEXP + a6*GenEXP + a7*Industries + a8*Prior\_Accuracy + a9*Broker\_Size + a10*Companies + Control\ variables \quad (9)$$

where *Period2*=1 if the forecast revision is issued in *Period 2*, and 0 otherwise; *Period3*=1 if the forecast revision is issued in *Period 3*, and 0 otherwise; *Period4*=1 if the forecast revision is issued in *Period 4*, and 0 otherwise; and *Period5*=1 if the forecast revision is issued in *Period 5*, and 0 otherwise.

III. 5. Analyst characteristics and the stock price response to forecast revisions

Next, we examine the relation between analyst characteristics and the stock market response to forecast revisions, and whether inclusion of analyst characteristics in the regressions affects the relation between the stock return sensitivity to forecast revisions and the timing of forecast revisions.

To examine the impact of analyst characteristics on the return sensitivity to forecast revisions over event time, we regress stock price response on forecast revisions interacted with event-time dummies and analyst characteristics. We measure the stock price response to earnings forecast revisions, *R(t, t+2)*, as the cumulative abnormal stock returns over three-day window from day t through day t+2, consistent with the measure in Ivković and Jegadeesh (2004). Specifically,

$$R(t, t+2) = \sum_{\tau=t}^{\tau=t+2} (r_\tau - r_\tau^{VWCRSP}) \quad (10)$$

where r_τ and r_τ^{VWCRSP} denote raw returns on the stock and the return on the value-weighted CRSP index. We truncate *R(t, t+2)* at 99% of the absolute value of *R(t, t+2)*.

The forecast revision, *FR*, is defined as:

$$FR_t = 100 \text{ x } [(new\_forecast_t - old\_forecast) / Abs(old\_forecast)] \quad (11)$$

where $new\_forecast_t$ is the revised forecast at time *t* and *old_forecast* is the last forecast by the same analyst before the revision. Following Ivković and Jegadeesh (2004), we truncate FR_t at 50% and -50%.

We establish two regression models, one with analyst characteristics and the other with interactions of analyst characteristics and forecast revision. The second model follows our prediction that the timing of forecast revision is the function of analyst characteristics. To make them consistent with those regression models in Ivković and Jegadeesh (2004), the regression models in these tests use revision timing in three periods: *D1* (days (7, 32) and days (-30, -6)), *D2* (days (-5, -1)), and *D3* (days (2, 6)).

$$\begin{aligned} R(t, t+2) = {} & a0 + a1*D1*FR + a2*D2*FR + a3*D3*FR + a4*FirmEXP + a5*GenEXP \\ & + a6*Industries + a7*Prior\_Accuracy + a8*Broker\_Size + a9*Companies + Control\ variables \end{aligned} \quad (12)$$

$$\begin{aligned} R(t, t+2) = {} & a0 + a1*D1*FR + a2*D2*FR + a3*D3*FR + a4*FR*FirmEXP \\ & + a5*FR*DGenEXP + a6*FR*DIndustries + a7*FR*DPrior\_Accuracy \\ & + a8*FR*DBroker\_Size + a9*FR*DCompanies + Control\ variables \end{aligned} \quad (13)$$

where *D1*=1 if the forecast revision is issued in *Period D1*, and 0 otherwise; *D2*=1 if the forecast revision is issued in *Period D2*, and 0 otherwise; and *D3*=1 if the forecast revision is issued in *Period D3*, and 0 otherwise. For the interaction between forecast revision and analyst characteristics in (13), we use dummy variables of analyst characteristics, each of which is 1 if the scaled analyst characteristic variable has a value greater than 0.5, and zero otherwise. Note that each scaled variable ranges from 0 to 1.

III. 4. Control variables

Following prior literature, we include control variables, including the days elapsed since the last forecast, the number of analysts' following the firm, firm size, and changes in earnings per share (EPS), in the multivariate analyses examining the relations among analyst characteristics, forecast revision timing, relative forecast error, and price response to forecast revisions. Specifically, these variables are measured as follows:

$DaysElapsed_{ijt}$ = a measure of the days elapsed since the last forecast by any analyst following firm *j*. We scale the raw variable to range from 0 to 1 using a transformation that preserves the relative distances for firm *j* in quarter *q*. It is calculated as the number of days between analyst *i*'s forecast of firm *j*'s earnings and the most recent preceding forecast of firm *j*'s earnings by any analyst minus the minimum number of days elapsed for analysts following firm *j* in quarter *q,* with this difference scaled by the range of days elapsed for analysts following firm *j* in quarter *q*;

$NumForecast_{ijq}$ = log value of the number of quarter *q* EPS forecasts by analyst *i* for the firm *j* between the quarter *q-1* and the quarter *q* earnings announcement dates;

MV_{jq-1} = firm size measured as the log value of the market value of equity at the end of fiscal quarter *q-1*; and

$AbsChg\_EPS_{jq-1}$ = the change in EPS, measured as the absolute value of (current quarter *q-1* actual EPS minus quarter *t – 5* actual EPS), deflated by the absolute value of quarter *q-5* actual EPS.

IV. Empirical Results

In this section, we present the results from analyses that examine the effect of analyst characteristics on the timing of forecast revisions, relative forecast accuracy, and return sensitivity to forecast revisions. For all multivariate analyses, we report test statistics and significance levels calculated based on the standard errors adjusted by a two-dimensional cluster at the firm and year levels. In panel data sets, residuals may be correlated across firms or across time, and Ordinary Least Squares (OLS) standard errors can be biased. Petersen (2008) proposes that adjusting standard errors by a two-

dimensional cluster at the firm and year levels is appropriate for estimating standard errors in corporate finance applications using panel data.

IV. 1. Descriptive Statistics

Table 1 presents the descriptive statistics on our final sample of analyst forecast revisions and analyst characteristics. Descriptive statistics are shown for all revisions in Panel A, for upward revisions in Panel B, and for downward revisions in Panel C. Our final sample includes 242,670 firm-quarter-analyst forecast revision observations. On average, analysts revise their first forecast 18.53 trading days after the prior quarterly earnings announcement. Revision timing is longer for downward revisions, meaning that downward revisions tend to be issued later in the fiscal quarter. The mean (median) value of the magnitude of forecast revision for the full sample of revisions is -7.944% (-2.083%) of the prior forecast. Not surprisingly, the revised forecasts are more accurate, as shown in the negative mean (median) value of the relative forecast error of -0.028 (-0.010). Negative relative forecast errors are evident for both upward and downward revisions. On average, analysts have about 15 quarters of firm-specific experience and 28 quarters of general experience. Analysts cover about four industries classified by a two-digit SIC code and 19 companies on average, and the sample mean (median) value of brokerage firm size is 73 (53). The mean (median) value of days elapsed since any analyst forecast is 11.43 (5) days. Finally, the average number of quarterly forecasts issued by an analyst is 1.57 in our sample.

To investigate whether analysts with different characteristics time their forecast revisions at different points during the fiscal quarter, we compare the means and medians of various forecast and analyst characteristics across five event-time periods, as defined in subsection III. 3. The results are reported in Table 2.

Panel A reports the results with all earnings forecast revisions. In Panel A, we find a high frequency of earnings forecast revisions during the quarter *q-1* earnings announcement period, *Period 1*. More than 30% of the forecast revisions are issued on the quarter *q-1* earnings announcement date and the following date. This finding is consistent with that reported in Ivković and Jegadeesh (2004). Both the

mean and the median of the relative forecast error, *RFE*, is negative for all event-time periods except *Period 2*, meaning that the revised analyst's forecast is more accurate than the consensus forecast on the day before the forecast revision. The magnitude of *RFE* is largest in *Period 1*, as earnings announcements provide new information to the market and analysts incorporate new information into their revisions. Among the other periods, the relative forecast error is most negative during the non-immediate pre-announcement period of quarter *q* earnings, *Period 4*. This means that forecast revisions issued during this period reflect superior information relative to those in other periods. The relative forecast error during the immediate pre-announcement period of quarter *q* earnings, *Period 5*, is more negative than those in Periods 2 and 3 based on both the means and the medians.[4]

Forecast revision (*FR*) is negative in all periods and more negative toward the quarter *q* earnings announcement. This finding is consistent with the expectations management hypothesis advanced by recent literature (e.g., Bartov, Givoly, and Hayn 2002; Matsumoto 2002; Richardson, Teoh, and Wysocki 2004). Researchers argue that managers deliberately guide analysts' forecasts lower before the earnings announcements, especially late in the fiscal period, so that firms can meet or beat analysts' forecasts and avoid negative earnings surprises.

Firm-specific and general experience (*FirmExp* and *GenExp*) tends to be greater for analysts who revise their forecasts later in the quarter. The number of industries an analyst follows in a year is greater for analysts who forecast during the post-announcement periods, *Periods 2* and *3*, relative to those who forecast during the pre-announcement periods, *Periods 4* and *5*. The same is true for the number of companies followed. Prior forecast accuracy is better for the analysts revising later in the quarter, indicating that analysts with superior ability tend to forecast during the pre-announcement period. The broker size is larger for analysts' revising earnings forecasts during the pre-announcement periods, *Period 4* and *5*, relative to those revising during the post-announcement periods, *Periods 2* and *3*. Overall,

[4] In our sample, forecast revisions during *Period 1* show far greater change in forecast error compared to those reported in Ivković and Jegadeesh (2004). Ivković and Jegadeesh (2004) report *RFE* of -0.21 percent on day 1, whereas the mean (median) *RFE* in our sample is -4.54 (-2.47) percent in *Period 1* (day 0 and day 1). Please note that consensus forecast error during days 0 and 1 in our sample is based on two-quarter-ahead analyst forecasts, while Ivković and Jegadeesh's consensus forecast are based on one-quarter-ahead forecasts only.

analysts with superior ability (i.e., those who have more firm-specific and general experience, and more accurate prior period forecasts, who are affiliated with larger brokers, and who follow fewer industries and companies) tend to forecast during the pre-announcement period. Panel A also shows that earlier revisions tend to be made in longer intervals and analysts who forecast later in the quarter forecast more forecasts in a quarter.

We also compare forecast and analyst characteristics across event-time periods for upward and downward forecast revisions separately. Panel B shows the results with upward revisions, while Panel C presents the results with downward revisions. Changes in forecast errors are more negative for downward revisions than upward revisions, indicating that forecasts become relatively more accurate after downward revisions. The temporal patterns of analyst characteristics for upward and downward revisions closely follow those in Panel A. Analysts who have more general and firm-specific experience, and more accurate prior period forecasts, who are affiliated with larger brokers, and follow fewer industries and companies tend to forecast during the pre-announcement period of quarter *q* earnings.

IV. 2. Association between forecast revision timing and analyst characteristics

In this subsection, we examine the association between forecast revision timing and analyst characteristics considering multiple forecast and analyst characteristics at the same time. Table 3 reports the results of regressions using the continuous event-time variable, *RT*, and Table 4 reports the results of logistic regressions based on the four discrete event-time periods, *Periods 2* to *5*. We exclude *Period 1* in the multivariate analyses because the incentive to revise forecasts during the quarter *q-1* earnings announcement period might be different from the incentive to revise during other periods. In addition, it is difficult to compare the relative forecast error in *Period 1* with those in other periods because the former is based on consensus forecasts calculated with two-quarter-ahead forecasts, while relative forecast errors

in other periods are based on consensus forecasts calculated with one-quarter ahead forecasts. Dropping *Period 1* is also consistent with Ivković and Jegadeesh (2004).[5]

Using the continuous event-time variable, *RT*, as a dependent variable, we estimate two different regression models in Table 3. We present the results for all revisions in Panel A, for the upward revisions in Panel B, and for the downward revisions in Panel C. In Panel A, the first model regresses the timing of forecast revisions on six analyst characteristics and two control variables: the days elapsed since the last forecast made by any analyst and the number of forecasts made by the analyst. The second model adds two more control variables: firm size and absolute changes in EPS. From both models, we find that analysts who have more general experience and more accurate prior period forecasts, and who are affiliated with larger brokers revise forecasts later in the quarter (i.e., during the non-immediate and immediate pre-announcement period of quarter *q* earnings). These results are consistent with those reported in Table 2. The coefficient on firm-specific experience is positive as expected, though statistically significant only in the first specification, indicating that analysts with more firm-specific experience revise their forecasts later.[6] The coefficient on the number of industries analysts follow is significantly negative in the second model, indicating that analysts following fewer industries tend to forecast later in the fiscal quarter. The coefficient on the number of companies that analysts follow is insignificant in both specifications. The coefficient on firm size is negative, meaning that analysts who follow larger firms revise forecasts earlier. The coefficient on EPS change is negative, indicating that for firms reporting large changes in EPS, analysts make their revisions relatively early.

The results for the upward revisions (reported in Panel B) and for the downward revisions (reported in Panel C) are quite similar to those in Panel A. The only qualitative difference is that the coefficient on general experience is marginally significant at best for upward revisions, while the

[5] We also estimate the forecast timing regressions as well as Logit models including revisions in *Period 1*. Untabulated results are consistent with those reported in Tables 3 and 4 with more statistically significant coefficients on *FirmEXP* and *GenEXP*.

[6] As documented by Clement and Tse (2005), the insignificant coefficient on *FirmExp* is caused by muliticollinearity between *FirmExp* and *GenExp.* After excluding *GenExp,* the coefficient on *FirmExp* becomes significant at the 1% level.

coefficient on firm-specific experience is insignificant for downward revisions. These results imply that the effect of analyst characteristics on revision timing is pretty much symmetric between upward and downward revisions. These results do not change even if we include revisions issued during *Period* 1.

Overall, the main message from the results in Table 3 is qualitatively the same as that in Table 2. Analysts with superior ability (i.e., those who have more firm-specific and general experience, have more accurate prior period forecasts, are affiliated with larger brokers, and follow fewer industries) tend to forecast during the pre-announcement period.

Next, we run logistic regressions with discrete event-time variables as dependent variables and forecast and analyst characteristics as explanatory variables. Logit models are estimated for each event-time period in turn, using the full sample revisions. In the regression analyses with the continuous event-time variable, *RT*, we assume that the relations between analyst characteristics and the timing of forecast revisions are linear and monotonic. It is possible that the relations between the revision timing and some analyst characteristics are non-monotonic. Table 4 presents the results from logistic regressions. The result with *Period 2* as a dependent variable is reported in Panel A (with *Period 3* in Panel B, *Period 4* in Panel C, and *Period 5* in Panel D). When the dependent variable is *Period 2* or *3*, which is the post-announcement period of quarter *q-1* earnings and therefore earlier in the quarter, we expect the signs on the explanatory variables to be opposite of those in Table 3. We expect this reversal of signs to be more pronounced with Period 2 as a dependent variable because it represents the earlier period of the two. Conversely, when the dependent variable is *Period 4* or *5*, which is the pre-announcement period of quarter *q* earnings and therefore later in the quarter, we expect the signs on the explanatory variables to be the same as those in Table 3.

As expected, in Panels C and D, the signs of the coefficients on analyst characteristics are the same in general as those reported in Table 3. However, the coefficient on *FirmEXP* is generally insignificant and the coefficient on *GenEXP* is insignificant when *Period 5* is a dependent variable. The coefficients on analyst characteristics are largely insignificant for downward revisions with *Period 5* as a dependent variable. Also as expected, in Panel A, the coefficients on explanatory variables are opposite of

those in Table 2, and the coefficients on analyst characteristics are mostly significant. The results in Panel B with *Period 3* as a dependent variable provide a hint that some of the relations between analyst characteristics and the revision timing may not be monotonic. Specifically, while the coefficients on prior period forecast accuracy, broker size, and number of industry followed, to a lesser degree, show the expected opposite signs of those in Table 2, the coefficients on firm-specific experience and general experience show the same signs as those in Table 2. These results indicate that, among analyst characteristics, prior period forecast accuracy and broker size have the most monotonic relations with revision timing. The relations between other analyst characteristics and revision timing appear less monotonic.

IV. 3. Analyst characteristics and the association between forecast revision timing and relative forecast error

Ivković and Jegadeesh (2004) find that the relative forecast error (the absolute value of the newly revised analyst's forecast error minus the absolute value of the consensus forecast error) becomes more negative later in the quarter. This means that improvement in accuracy from a revised forecast is greater during the pre-announcement period of quarter *q* earnings than during the post-announcement period of quarter *q-1* earnings. In the previous two sections, we show that analyst characteristics are associated with revision timing. Clement and Tse (2003) and others show that analyst characteristics are associated with forecast accuracy. Therefore, it is an empirical question whether the relation between relative forecast error and revision timing observed in Ivković and Jegadeesh (2004) is intact after controlling for analyst characteristics. The results are reported in Table 5. Again, we report the results for the all revisions in Panel A, for upward revisions in Panel B, and for downward revisions in Panel C.

In Panel A, regression models (1) and (3) employ the continuous event-time variable, *RT*, and models (2) and (4) employ discrete event-time periods. We include only event-time variable(s) in regression models (1) and (2), while we add forecast and analyst characteristics as well as control variables as additional explanatory variables in models (3) and (4). The coefficient on *RT* in model (1) is

negative, indicating that the relative forecast error becomes more negative later in the quarter. Thus revisions made later in the fiscal quarter are relatively more accurate than those made earlier in the quarter. This result is consistent with those in Ivković and Jegadeesh (2004). Having more negative coefficients on Period 4 and Period 5 compared to those on Period 2 and Period 3 in model (2) is also consistent with the results in Ivković and Jegadeesh (2004). The negative coefficient on *RT* and relatively more negative coefficients on *Period 4* and *Period 5* do not disappear even when forecast and analyst characteristics are included in the regression models.

Analyst characteristics that are positively associated with the analysts' ability are negatively associated with relative forecast error. Relative forecast errors are more negative for analysts with more firm-specific experience and better prior period forecast accuracy, who are affiliated with larger brokers and follow fewer firms. The coefficient on the general career experience and the number of industries following are insignificant.

In Panel B, the results for the upward revisions show the negative coefficient on *RT* and the relatively more negative coefficients on *Period 4* and *Period 5* in all regression models regardless of whether forecast and analyst characteristics are included. The coefficient on firm-specific experience for upward revisions is significantly negative, meaning that analysts with more firm-specific experience issue more accurate forecasts in the case of upward revisions. The results for the downward revisions reported in Panel C mirror those in Panel A, except that the coefficient on firm-specific experience is statistically insignificant.

The results in Table 5 thus indicate that while analyst characteristics are associated with relative forecast error in the expected directions and analyst characteristics are associated with revision timing, as documented in the subsections IV. 1. and IV. 2., the relation between revision timing and relative forecast error holds, even after controlling for the impact of analyst characteristics on revision timing.

IV. 4. Analyst characteristics and the association between forecast revision timing and stock price sensitivity to forecast revisions

To examine the relation between forecast timing and return sensitivity to revisions, Ivković and Jegadeesh (2004) regress three-day, market-adjusted stock returns following the forecast revision on the forecast revision (*FR*) interacted with three event-time dummies: the dummy for the period away from earnings announcements (*D1*), the dummy for the immediate pre-announcement period of quarter *q* earnings (*D2*), and the dummy for the immediate post-announcement period of quarter *q-1* earnings (*D3*). They find that the coefficient on *D1*FR* is the largest, the coefficient on *D2*FR* is the second largest, and the coefficient on *D3*FR* is the smallest. Thus they find the weakest price response during the post-announcement period of quarter *q-1* earnings. According to our results in Tables 1 and 3, this is the period in which analysts with less ability revise their forecasts. It is possible that the findings in Ivković and Jegadeesh (2004) are the results of weaker analysts forecasting with little information in this period. To examine the impact of analyst characteristics on the relation between return sensitivity and revision timing, we include analyst characteristics in the stock price response model of Ivković and Jegadeesh (2004).

In Panel A, we report the results with all revisions. Regression model (1) replicates Ivković and Jegadeesh's (2004) regression. The coefficient estimates on three interaction variables are comparable to those in Ivković and Jegadeesh (2004) in magnitude, and the order of the coefficients is the same; i.e., the coefficient on *D1*FR* is the largest, the coefficient on *D2*FR* is the second largest, and the coefficient on *D3*FR* is the smallest. In model (2), we include various forecast and firm characteristics, but the coefficients do not change much. In model (3), we include analyst characteristics, and in model (4) we include interactions of the forecast revision and analyst characteristics. In all regression specifications, the order of return sensitivity across the different revision timing is preserved, though the magnitude of the coefficients decreases in model (4), in which we include interactions of the forecast revision and analyst characteristics. From model (4), we find that the return sensitivity is greater for forecast revisions made by analysts with more firm-specific experience, from large brokerage firms, and with better prior period forecast accuracy. The coefficient on the interaction of forecast revision and general experience is unexpectedly negative.

Consistent with Ivković and Jegadeesh (2004), we find that the return sensitivity is greatest for revisions made during the immediate pre-announcement period of quarter *q* earnings for the upward revisions. The results for the upward revisions are reported in Panel B. These results do not disappear even when we control for analyst characteristics. Panel C reports the results for downward revisions. Also consistent with Ivković and Jegadeesh (2004), the return sensitivity is statistically significant only during the period away from earnings announcements, *D1*. This result does not change even when we include analyst characteristics in the regression equations. To summarize, the association between return sensitivity and revision timing documented in Ivković and Jegadeesh (2004) is not sensitive to taking analyst characteristics into consideration.

IV. 5. Sensitivity analysis

In our main analyses, our sample revisions consist of the first forecast revision for each analyst since the quarter *q-1* earnings announcement. While this choice has many advantages,[7] it is not without problems. If an analyst makes a revision on the announcement date of quarter *q-1* earnings or the next day, the subsequent forecasts by this analyst will be excluded from the sample revisions in the later periods. It is possible that analysts with superior ability revise earnings forecasts during the *q-1* earnings announcement period and revise again later in the fiscal quarter. Our results may not portray the impact of analyst characteristics on the revision timing correctly because we exclude first-moving analysts' revisions in the later periods. Because most analysts revise quarterly forecasts just once after the quarter *q-1* earnings announcement, this is not a serious concern in quarterly forecast revisions. Nonetheless, we test the sensitivity of our results reported in subsections IV. 2-4. with respect to the choice of revisions included in the sample. We re-perform regressions (3), (8), and (13) with two additional sets of samples. We first perform the analyses with a sample of all forecast revisions, *not excluding* subsequent forecast

[7] For example, by including only one revision for each analyst, we can avoid econometric problems stemming from including multiple revisions by the same analysts in the sample. The timing of forecasts is the more critical decision for the first revision. This sample choice enables us to compare our results with those in Ivković and Jegadeesh (2004).

revisions of the same analysts. We also perform the analyses with a sample with only the last revision for each analyst. The results are reported in Tables 7 and 8.

Table 7 presents the results with all forecast revisions. The first regression result shows that analysts with high prior forecast accuracy, larger brokerage firm size, and limited industry coverage tend to issue forecast revisions later. Coefficients on *FirmExp* and *GenExp* are positive but insignificant. In the relative forecast error regression, improvement in forecast accuracy over consensus increases as time progresses toward the quarter *q* earnings announcement. The relative forecast error also decreases with prior forecast accuracy and brokerage firm size, and increases with the number of companies covered. Finally, the analysis on return sensitivity to forecast revisions shows that stock price reaction to forecast revision is greatest in period *D1 and* weakest in period *D3*. All three sets of results are consistent with those reported in Tables 3, 5, and 6. We also perform the analyses for upward revisions and downward revisions separately. Untabulated results are qualitatively the same as those with first revisions only. The results with the last revision of each analyst are reported in Table 8. In general, results are quite similar to those reported in Table 7 and are consistent with those in Tables 3, 5, and 6. Again, untabulated results for upward revisions and downward revisions separately are qualitatively the same as those with first revisions only and those with all forecast revisions. These results suggest that our empirical results are not sensitive to different sets of sample revisions.

V. Conclusions

Prior literature pays limited attention to the timing of analysts' forecasts and incentives, as well as the determinants of this timing. In this study, we examine the relation between analyst characteristics and the timing of forecast revisions. We also examine whether previously documented relations among relative forecast accuracy, return sensitivity on forecast revisions, and revision timing are sensitive to taking analyst characteristics into account.

Our results suggest that analysts with superior ability (i.e., those who have more firm-specific and general experience, have more accurate prior period forecasts, are affiliated with larger brokers, and

follow fewer industries and companies) tend to forecast later in the quarter. From the logistic regressions using discrete event-time variables as dependent variables, we further find that the relations between some analyst characteristics and the revision timing are not monotonic.

Prior literature finds greater improvement of analysts' forecasts relative to consensus forecasts later in the quarter, while we show that analyst characteristics are associated with forecast revision timing. Therefore, it is an empirical question whether the relation between relative forecast error (inversely related to the relative improvement in forecast accuracy) and revision timing is intact even after taking analyst characteristics into account. We find that the negative association between relative forecast error and revision timing is preserved even when analyst characteristics are controlled for. As expected, we also find that analyst characteristics that proxy for analysts' ability are negatively associated with relative forecast error.

We also examine the impact of analysts' characteristic on the return sensitivity to forecast revisions over event time. Our evidence indicates that, consistent with Ivković and Jegadeesh (2004), return sensitivity to forecast revisions is the smallest during the post-announcement period of quarter *q-1* earnings, the greatest during the pre-announcement period of quarter *q* earnings for upward revisions, and the greatest during the period away from earnings announcements for downward revisions. These results are not sensitive to the inclusion of analyst characteristics in the regression models.

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Table 1: Descriptive Statistics of Forecast and Analyst Characteristics

This table reports descriptive statistics of unscaled forecast and analyst characteristics. Our sample consists of 247,670 quarterly analyst forecast revisions from January 1990 to August 2005, of which 104,633 are upward revisions and 138,037 are downward revisions. We classify each earnings forecast revision as an upward revision or a downward revision based on whether the revised forecast is above or below the previous forecast of the revising analyst. Analyst and forecast characteristics are calculated from I/B/E/S detail tape. We restrict the sample to quarterly earnings per share (EPS) forecasts issued between the prior quarter earnings announcement (EAD_{q-1}) and the current quarter earnings announcement (EAD_q) with a minimum of two analysts following the firm. We include the first forecast revised by each analyst for a particular firm in each sample quarter.

Number of Revisions is the number of forecast revisions by the analysts since EAD_{q-1}; *Revision Timing* is the number of days since EAD_{q-1}; *Relative Forecast Error* is the absolute value of an individual analyst's forecast error minus the absolute value of the mean consensus forecast error measured one day prior to the analyst's forecast revision. The consensus forecast is measured as the average of each analyst's most recent forecast issued since EAD_{q-1}. For trading days 0 and 1 after EAD_{q-1}, we compute the consensus forecast including forecasts issued between EAD_{q-2} and EAD_{q-1}; *Forecast Revision* is the change in an individual analyst's quarterly EPS forecast scaled by the absolute value of the old forecast and multiplied by 100; *Firm Experience* is the number of quarters of firm-specific experience for each analyst; *General Experience* is the number of quarters of career experience for each analyst; *Number of Industries Following* is the number of two-digit SIC industries the analyst follows in the year; *Prior Period Forecast Error* is the ratio of the absolute value of forecast error of the analyst's last EPS forecast for quarter *q-1* EPS; *Broker Size* is the number of analysts in the analyst's brokerage firm in the year; *Number of Companies Following* is the number of companies the analyst follows in the year; *Days Elapsed Since Last Forecast* is the number of days since any analyst's prior forecast; *Number of Forecasts* is the number of quarterly EPS forecasts issued by the analyst since EAD_{q-1}.

Panel A: Distribution of raw (unscaled) forecast and analyst characteristics

Variable	Mean	Std Dev	25th Pctl	Median	75th Pctl
Number of Revisions	1.385	0.665	1	1	2
Revision Timing	18.530	20.911	1.000	7.000	36.000
Relative Forecast Error	-0.028	0.151	-0.063	-0.010	0.024
Forecast Revision	-7.944	108.289	-11.111	-2.083	5.882
Firm Experience	14.766	15.174	4	9	21
General Experience	28.283	20.362	11	24	42
Number of Industries Following	3.838	2.700	2	3	5
Prior Period Forecast Error	0.125	0.160	0.026	0.070	0.160
Broker Size	72.702	67.521	25	53	99
Number of Companies Following	18.631	10.779	13	16	22
Days Elapsed Since Last Forecast	11.432	16.459	1	5	14
Number of Forecasts	1.572	0.736	1	1	2

Table 1: continued

Panel B: Descriptive statistics for upward revisions

Variable	Mean	Std Dev	25th Pctl	Median	75th Pctl
Number of Revisions	1.369	0.655	1	1	2
Revision Timing	15.872	20.039	1.000	4.000	28.000
Relative Forecast Error	-0.023	0.115	-0.058	-0.014	0.015
Forecast Revision	18.407	71.794	3.540	7.500	16.667
Firm Experience	14.367	15.012	4	9	20
General Experience	27.968	20.422	11	23	42
Number of Industries Following	3.689	2.585	2	3	5
Prior Period Forecast Error	0.136	0.157	0.036	0.084	0.176
Broker Size	72.957	66.772	25	54	99
Number of Companies Following	18.531	10.571	13	16	22
Days Elapsed Since Last Forecast	11.894	17.078	1	5	14
Number of Forecasts	1.531	0.726	1	1	2

Panel C: Descriptive statistics for downward revisions

Variable	Mean	Std Dev	25th Pctl	Median	75th Pctl
Number of Revisions	1.398	0.672	1	1	2
Revision Timing	20.545	21.329	1.000	11.000	40.000
Relative Forecast Error	-0.033	0.173	-0.069	-0.006	0.032
Forecast Revision	-27.918	125.630	-21.429	-9.091	-3.883
Firm Experience	15.069	15.289	4	9	21
General Experience	28.522	20.313	11	25	42
Number of Industries Following	3.950	2.780	2	3	5
Prior Period Forecast Error	0.117	0.162	0.020	0.059	0.143
Broker Size	72.509	68.083	24	53	98
Number of Companies Following	18.707	10.935	13	16	22
Days Elapsed Since Last Forecast	11.081	15.964	1	5	14
Number of Forecasts	1.603	0.742	1	1	2

Table 2: Analyst Characteristics and Forecast Timing

This table reports descriptive statistics of forecast and analyst characteristics for quarterly analyst forecast revisions in five event periods relative to the prior quarter and the current quarter earnings announcement dates. We classify each earnings forecast revision as an upward revision or a downward revision based on whether the revised forecast is above or below the previous forecast of the revising analyst. Analyst and forecast characteristics are calculated from I/B/E/S detail tape. We restrict the sample to quarterly earnings per share (EPS) forecasts issued between the prior quarter earnings announcement (EAD_{q-1}) and the current quarter earnings announcement (EAD_q) with a minimum of two analysts following the firm. We include the first forecast revised by each analyst for a particular firm in each sample quarter.

N is the number of forecast revisions in each period; *RT* is the number of days since EAD_{q-1}, scaled to range from 0 to 1; *RFE* (relative forecast error) is the absolute value of an individual analyst's forecast error minus the absolute value of mean consensus forecast error measured one day prior to the analyst's forecast revision. Consensus forecast is measured as the average of each analyst's most recent forecast issued since EAD_{q-1}. For trading days 0 and 1 after EAD_{q-1}, we compute the consensus forecast including forecasts issued between EAD_{q-2} and EAD_{q-1}; *FR* (forecast revision) is the change in an individual analyst's quarterly EPS forecast scaled by the absolute value of the old forecast and multiplied by 100; *FirmEXP* (scaled firm experience) is the number of quarters of firm-specific experience for each analyst, scaled to range from 0 to 1; *GenEXP* (scaled general experience) is the number of quarters of career experience for each analyst, scaled to range from 0 to 1; *Industries* (scaled number of industries following) is the number of two-digit SIC industries the analyst follows in the year, scaled to range from 0 to 1; *Prior_Accuracy* (scaled prior period forecast accuracy) is the forecast accuracy of the analyst's last forecast for *q-1* quarter EPS, scaled to range from 0 to 1; *Broker_ Size* (scaled brokerage firm size) is the number of analysts in the analyst's brokerage firm in the year, scaled to range from 0 to 1; *Companies* (scaled number of companies following) is the number of companies the analyst follows in the year, scaled to range from 0 to 1; *DaysElapsed* (scaled number of days elapsed since the last forecast) is the number of days since any analyst's prior forecast, scaled to range from 0 to 1; *Numforecast* is log of the number of quarterly EPS forecasts issued by the analyst since EAD_{q-1}. All variables except *RFE, FR,* and *Numforecast* are scaled to range from 0 to 1 for each firm-quarter.

Panel A: All forecast revisions

Mean

Period[*]	*N*	*%*	*RT*	*RFE*	*FR*	*FirmEXP*	*GenEXP*	*Industries*	*Prior_ Accuracy*	*Broker_Size*	*Companies*	*DaysElapsed*	*NumForecast*
1	77,700	32.0	0.0139	-0.0455	-3.6428	0.4021	0.4032	0.3454	0.5718	0.3280	0.4261	0.6173	0.3020
2	41,875	17.3	0.1090	0.0009	-8.0051	0.4182	0.4402	0.3718	0.5627	0.2807	0.4178	0.9565	0.2929
3	55,700	23.0	0.3685	-0.0086	-7.3692	0.4510	0.4908	0.3652	0.5811	0.3143	0.4140	0.7164	0.3915
4	59,311	24.4	0.8097	-0.0458	-13.8794	0.4455	0.4830	0.3414	0.6099	0.3731	0.4070	0.6611	0.4414
5	8,084	3.3	0.9824	-0.0274	-9.3888	0.4373	0.4771	0.3518	0.6053	0.3469	0.4094	0.6824	0.4088
Total	242,670	100.0	0.3385	-0.0285	-7.9442	0.4279	0.4517	0.3537	0.5828	0.3284	0.4167	0.7115	0.3586

Table 2: continued

Median

Period[*]	*N*	*%*	*RT*	*RFE*	*FR*	*FirmEXP*	*GenEXP*	*Industries*	*Prior_ Accuracy*	*Broker_Size*	*Companies*	*DaysElapsed*	*NumForecast*
1	77,700	32.0	0.0000	-0.0247	0.0000	0.3019	0.3148	0.2500	0.6364	0.2673	0.3784	0.7879	0.0000
2	41,875	17.3	0.0377	0.0000	-1.5152	0.3281	0.3590	0.3000	0.6154	0.1911	0.3600	1.0000	0.0000
3	55,700	23.0	0.3167	0.0000	-2.2074	0.3750	0.4444	0.2727	0.6667	0.2197	0.3462	0.8261	0.0000
4	59,311	24.4	0.8475	-0.0139	-4.3478	0.3636	0.4314	0.2500	0.6757	0.2841	0.3404	0.8182	0.6931
5	8,084	3.3	1.0000	-0.0091	-2.7785	0.3500	0.4167	0.2500	0.6667	0.2627	0.3333	0.8261	0.6931
Total	242,670	100.0	0.1273	-0.0099	-2.0833	0.3333	0.3778	0.2500	0.6667	0.2477	0.3590	0.8846	0.0000

Panel B: Upward revisions

Mean

Period	*N*	*%*	*RT*	*RFE*	*FR*	*FirmEXP*	*GenEXP*	*Industries*	*Prior_ Accuracy*	*Broker_Size*	*Companies*	*DaysElapsed*	*NumForecast*
1	38,784	37.1	0.0129	-0.0442	16.9488	0.4039	0.3998	0.3489	0.5393	0.3287	0.4277	0.6160	0.2855
2	19,381	18.5	0.1050	-0.0008	17.5630	0.4175	0.4335	0.3723	0.5294	0.2826	0.4141	0.9582	0.2750
3	22,722	21.7	0.3669	-0.0030	18.6721	0.4498	0.4852	0.3626	0.5557	0.3079	0.4181	0.7113	0.3711
4	20,587	19.7	0.8299	-0.0263	21.2641	0.4437	0.4746	0.3374	0.5935	0.3729	0.4093	0.6410	0.4231
5	3,159	3.0	0.9876	-0.0249	20.9487	0.4451	0.4770	0.3531	0.6025	0.3615	0.4098	0.6812	0.3958
Total	104,633	100.0	0.2970	-0.0231	18.4066	0.4255	0.4416	0.3541	0.5536	0.3253	0.4189	0.7070	0.3325

Median

Period	*N*	*%*	*RT*	*RFE*	*FR*	*FirmEXP*	*GenEXP*	*Industries*	*Prior_ Accuracy*	*Broker_Size*	*Companies*	*DaysElapsed*	*NumForecast*
1	38,784	37.1	0.0000	-0.0317	7.3889	0.3077	0.3095	0.2857	0.5556	0.2683	0.3750	0.7879	0.0000
2	19,381	18.5	0.0370	0.0000	7.4074	0.3269	0.3478	0.3000	0.5333	0.1911	0.3571	1.0000	0.0000
3	22,722	21.7	0.3125	-0.0023	7.3171	0.3723	0.4340	0.2727	0.6000	0.2103	0.3548	0.8182	0.0000
4	20,587	19.7	0.8596	-0.0154	7.9872	0.3659	0.4177	0.2500	0.6667	0.2830	0.3448	0.8000	0.6931
5	3,159	3.0	1.0000	-0.0146	7.6923	0.3725	0.4048	0.2500	0.6667	0.2780	0.3404	0.8333	0.6931
Total	104,633	100.0	0.0635	-0.0139	7.5000	0.3333	0.3625	0.2667	0.6000	0.2449	0.3636	0.8846	0.0000

Table 2: continued

Panel C: Downward revisions

Mean

Period	*N*	*%*	*RT*	*RFE*	*FR*	*FirmEXP*	*GenEXP*	*Industries*	*Prior_ Accuracy*	*Broker_Size*	*Companies*	*DaysElapsed*	*NumForecast*
1	38,916	28.2	0.0149	-0.0468	-24.1645	0.4003	0.4066	0.3419	0.6042	0.3274	0.4244	0.6186	0.3185
2	22,494	16.3	0.1124	0.0023	-30.0348	0.4189	0.4459	0.3714	0.5913	0.2791	0.4210	0.9551	0.3083
3	32,978	23.9	0.3695	-0.0124	-25.3117	0.4519	0.4947	0.3669	0.5986	0.3187	0.4111	0.7200	0.4055
4	38,724	28.1	0.7990	-0.0562	-32.5629	0.4464	0.4875	0.3436	0.6187	0.3732	0.4058	0.6718	0.4511
5	4,925	3.6	0.9790	-0.0290	-28.8480	0.4323	0.4771	0.3510	0.6071	0.3375	0.4092	0.6832	0.4171
Total	138,037	100.0	0.3699	-0.0326	-27.9183	0.4297	0.4593	0.3535	0.6049	0.3307	0.4149	0.7149	0.3783

Median

Period	*N*	*%*	*RT*	*RFE*	*FR*	*FirmEXP*	*GenEXP*	*Industries*	*Prior_ Accuracy*	*Broker_Size*	*Companies*	*DaysElapsed*	*NumForecast*
1	38,916	28.2	0.0000	-0.0148	-8.3333	0.3000	0.3210	0.2500	0.6667	0.2667	0.3793	0.7877	0.0000
2	22,494	16.3	0.0385	0.0000	-8.9744	0.3333	0.3673	0.3000	0.6667	0.1914	0.3636	1.0000	0.0000
3	32,978	23.9	0.3200	0.0000	-8.2353	0.3750	0.4528	0.2727	0.6667	0.2268	0.3421	0.8333	0.0000
4	38,724	28.1	0.8409	-0.0128	-11.3208	0.3636	0.4375	0.2500	0.7143	0.2846	0.3333	0.8261	0.6931
5	4,925	3.6	1.0000	-0.0054	-10.2692	0.3378	0.4231	0.2500	0.6685	0.2500	0.3333	0.8214	0.6931
Total	138,037	100.0	0.2000	-0.0062	-9.0909	0.3333	0.3913	0.2500	0.6667	0.2500	0.3559	0.8846	0.0000

* The timing of forecast revisions is grouped into five periods as follows:

Period 1: days (0, 1) (announcement period of quarter *q-1* earnings)
Period 2: days (2, 6) (immediate post-announcement period of quarter *q-1* earnings)
Period 3: days (7, 32) (non-immediate post-announcement period of quarter *q-1* earnings)
Period 4: days (-30, -6) (non-immediate pre-announcement period of quarter *q* earnings)
Period 5: days (-5, -1) (immediate pre-announcement period of quarter *q* earnings)

where quarter *q* is the quarter for which earnings are being forecasted. Trading days 0 through 32 are measured as the number of trading days relative to EAD_{q-1}, and trading days -30 through -1 are measured as the number of trading days relative to EAD_q.

Table 3: Determinants of Analyst Forecast Timing - Regression Analysis

This table reports the results from the regression of forecast revision timing (*RT*) on analyst characteristics and control variables. *RT* is the number of days since EAD_{q-1}, scaled to range from 0 to 1; *FirmEXP* (scaled firm experience) is the number of quarters of firm-specific experience for each analyst, scaled to range from 0 to 1; *GenEXP* (scaled general experience) is the number of quarters of career experience for each analyst, scaled to range from 0 to 1; *Industries* (scaled number of industries following) is the number of two-digit SIC industries the analyst follows in the year, scaled to range from 0 to 1; *Prior_Accuracy* (scaled prior period forecast accuracy) is the forecast accuracy of the analyst's last forecast for *q-1* quarter EPS, scaled to range from 0 to 1; *Broker_ Size* (scaled brokerage firm size) is the number of analysts in the analyst's brokerage firm in the year, scaled to range from 0 to 1; *Companies* (scaled number of companies following) is the number of companies the analyst follows in the year, scaled to range from 0 to 1; *DaysElapsed* (scaled number of days elapsed since the last forecast) is the number of days since any analyst's prior forecast, scaled to range from 0 to 1; *Numforecast* is log of the number of quarterly EPS forecasts issued by the analyst since EAD_{q-1}. *MV* is the log of the market value of equity of the firm at the end of fiscal quarter *q-1*; *AbsChgEPS* is the absolute value of the difference between quarter *q-1* and quarter *q-5* actual EPS, deflated by the absolute value of quarter *q-5* EPS. All variables except *Numforecast*, *MV*, and *AbsChgEPS* are scaled to range from 0 to 1 for each firm-quarter.

All test statistics and significance levels are calculated based on the standard errors adjusted by a two-dimensional cluster at the firm and year levels.

Panel A: All forecast revisions

	model (1)			model (2)		
Variables	parameter estimate	t-value	Pr > |t|	parameter estimate	t-value	Pr > |t|
Intercept	0.7022	86.87	0.0000	0.8250	46.20	0.0000
FirmEXP	0.0113	2.45	0.0140	0.0056	1.22	0.2220
GenEXP	0.0135	2.21	0.0270	0.0184	3.05	0.0020
Industries	-0.0065	-1.34	0.1820	-0.0154	-3.33	0.0010
Prior_Accuracy	0.0259	7.85	0.0000	0.0294	8.97	0.0000
Broker_Size	0.1230	18.10	0.0000	0.1148	17.00	0.0000
Companies	0.0008	0.13	0.8980	-0.0007	-0.12	0.9080
DaysElapsed	-0.3578	-26.60	0.0000	-0.3546	-26.69	0.0000
NumForecast	-0.0164	-1.62	0.1050	-0.0100	-0.99	0.3240
MV				-0.0140	-7.85	0.0000
AbsChg_EPS				-0.0186	-6.16	0.0000
N		135,406			135,406	
Adjusted R-squared		0.1072			0.1126	

Table 3: continued

Panel B: Upward revisions

	model (1)			model (2)		
Variables	parameter estimate	t-value	Pr > |t|	parameter estimate	t-value	Pr > |t|
Intercept	0.6993	68.27	0.0000	0.8162	37.09	0.0000
FirmEXP	0.0165	2.69	0.0070	0.0124	2.04	0.0410
GenEXP	0.0091	1.28	0.2020	0.0125	1.76	0.0780
Industries	-0.0102	-1.50	0.1330	-0.0177	-2.63	0.0080
Prior_Accuracy	0.0363	7.07	0.0000	0.0393	7.74	0.0000
Broker_Size	0.1192	13.53	0.0000	0.1119	12.93	0.0000
Companies	0.0060	0.95	0.3440	0.0045	0.70	0.4860
DaysElapsed	-0.4052	-29.70	0.0000	-0.4028	-29.72	0.0000
NumForecast	0.0001	0.01	0.9950	0.0068	0.54	0.5920
MV				-0.0126	-5.74	0.0000
AbsChg_EPS				-0.0274	-6.49	0.0000
N		53,233			53,233	
Adjusted R-squared		0.1381			0.1423	

Panel C: Downward revisions

	model (1)			model (2)		
Variables	parameter estimare	t-value	Pr > |t|	parameter estimate	t-value	Pr > |t|
Intercept	0.7113	87.65	0.0000	0.8287	45.16	0.0000
FirmEXP	0.0088	1.58	0.1150	0.0029	0.51	0.6070
GenEXP	0.0144	1.91	0.0570	0.0195	2.56	0.0100
Industries	-0.0043	-0.78	0.4330	-0.0134	-2.62	0.0090
Prior_Accuracy	0.0125	3.03	0.0020	0.0162	3.96	0.0000
Broker_Size	0.1247	17.45	0.0000	0.1166	16.30	0.0000
Companies	-0.0024	-0.29	0.7740	-0.0033	-0.41	0.6840
DaysElapsed	-0.3264	-22.04	0.0000	-0.3227	-22.19	0.0000
NumForecast	-0.0322	-3.33	0.0010	-0.0260	-2.66	0.0080
MV				-0.0136	-7.00	0.0000
AbsChg_EPS				-0.0174	-5.57	0.0000
N		82,173			82,173	
Adjusted R-squared		0.0970			0.1012	

Table 4: Determinants of Analyst Forecast Timing – Logistic Regressions

This table reports the results from Logit models designed to examine the association between forecast timing and analyst characteristics. The timing of forecast revisions is grouped into five periods as follows: [Period 1: days (0, 1) (announcement period of quarter q-1 earnings); Period 2: days (2, 6) (immediate post-announcement period of quarter q-1 earnings); Period 3: days (7, 32) (non-immediate post-announcement period of quarter q-1 earnings); Period 4: days (-30, -6) (non-immediate pre-announcement period of quarter q earnings); Period 5: days (-5, -1) (immediate pre-announcement period of quarter q earnings)] where quarter q is the quarter for which earnings are being forecasted. Trading days 0 through 32 are measured as the number of trading days relative to the prior quarter earnings announcement date (EAD_{q-1}), and trading days -30 through -1 are measured as the number of trading days relative to the current quarter earnings announcement (EAD_q). Dependent variable *Period 2* (*Period 3, Period 4, Period 5*) takes value of 1 if the forecast revision is issued during Period 2 (Period 3, Period 4, Period 5), and 0 otherwise. *FirmEXP* (scaled firm experience) is the number of quarters of firm-specific experience for each analyst, scaled to range from 0 to 1; *GenEXP* (scaled general experience) is the number of quarters of career experience for each analyst, scaled to range from 0 to 1; *Industries* (scaled number of industries following) is the number of two-digit SIC industries the analyst follows in the year, scaled to range from 0 to 1; *Prior_Accuracy* (scaled prior period forecast accuracy) is the forecast accuracy of the analyst's last forecast for *q-1* quarter EPS, scaled to range from 0 to 1; *Broker_ Size* (scaled brokerage firm size) is the number of analysts in the analyst's brokerage firm in the year, scaled to range from 0 to 1; *Companies* (scaled number of companies following) is the number of companies the analyst follows in the year, scaled to range from 0 to 1; *DaysElapsed* (scaled number of days elapsed since the last forecast) is the number of days since any analyst's prior forecast, scaled to range from 0 to 1; *Numforecast* is log of the number of quarterly EPS forecasts issued by the analyst since EAD_{q-1}. *MV* is the log of the market value of equity of the firm at the end of fiscal quarter *q-1*; *AbsChgEPS* is the absolute value of the difference between quarter *q-1* and quarter *q-5* actual EPS, deflated by the absolute value of quarter *q-5* EPS. All variables except *Numforecast*, *MV*, and *AbsChgEPS* are scaled to range from 0 to 1 for each firm-quarter.

All test statistics and significance levels are calculated based on the standard errors adjusted by a two-dimensional cluster at the firm and year levels.

Panel A: *Pr(Period 2 = 1)*

	all forecast revisions			upward revisions			downward revisions		
Variables	parameter estimate	Wald Chi-Square	Pr > ChiSquare	parameter estimate	Wald Chi-Square	Pr > ChiSquare	parameter estimate	Wald Chi-Square	Pr > ChiSquare
Intercept	-7.7626	-28.01	0.0000	-8.3135	-24.33	0.0000	-7.3773	-26.12	0.0000
FirmEXP	-0.0506	-1.82	0.0690	-0.0709	-1.80	0.0710	-0.0510	-1.40	0.1600
GenEXP	-0.3095	-7.01	0.0000	-0.2995	-6.17	0.0000	-0.2968	-5.28	0.0000
Industries	0.1576	4.85	0.0000	0.2307	4.78	0.0000	0.0965	2.88	0.0040
Prior_Accuracy	-0.2229	-9.41	0.0000	-0.2781	-8.71	0.0000	-0.1280	-4.22	0.0000
Broker_Size	-0.5277	-9.50	0.0000	-0.4512	-7.41	0.0000	-0.5961	-9.82	0.0000
Companies	0.0596	1.33	0.1830	-0.0320	-0.61	0.5450	0.1216	2.24	0.0250
DaysElapsed	7.9622	29.06	0.0000	8.7827	24.67	0.0000	7.4290	28.58	0.0000
NumForecast	-0.5922	-10.59	0.0000	-0.5650	-8.57	0.0000	-0.5666	-9.25	0.0000
MV	0.0228	1.31	0.1900	0.0198	1.03	0.3030	0.0116	0.61	0.5430
AbsChg_EPS	0.0464	1.66	0.0980	0.1224	3.45	0.0010	0.0388	1.32	0.1850
N		135,406			135,406			135,406	
Pseudo R-squared		0.3203			0.3646			0.2902	

Table 4: continued

Panel B: *Pr(Period 3 = 1)*

	all forecast revisions			upward revisions			downward revisions		
Variables	parameter estimate	Wald Chi-Square	Pr > ChiSquare	parameter estimate	Wald Chi-Square	Pr > ChiSquare	parameter estimate	Wald Chi-Square	Pr > ChiSquare
Intercept	0.0957	1.16	0.2450	0.4112	3.28	0.0010	-0.0844	-1.06	0.2870
FirmEXP	0.0305	1.08	0.2810	-0.0003	-0.01	0.9940	0.0485	1.48	0.1390
GenEXP	0.1907	5.83	0.0000	0.2508	6.15	0.0000	0.1561	3.99	0.0000
Industries	0.0243	0.81	0.4170	-0.0448	-1.07	0.2840	0.0764	2.27	0.0230
Prior_Accuracy	-0.0673	-3.60	0.0000	-0.0628	-2.41	0.0160	-0.0599	-2.70	0.0070
Broker_Size	-0.3302	-9.28	0.0000	-0.4092	-9.15	0.0000	-0.2823	-7.41	0.0000
Companies	-0.0267	-0.79	0.4280	0.0239	0.54	0.5880	-0.0705	-1.83	0.0670
DaysElapsed	-0.5731	-6.86	0.0000	-0.7285	-8.43	0.0000	-0.4787	-5.39	0.0000
NumForecast	0.0406	0.77	0.4400	0.0932	1.47	0.1430	0.0173	0.33	0.7380
MV	-0.0358	-4.39	0.0000	-0.0604	-4.97	0.0000	-0.0240	-2.95	0.0030
AbsChg_EPS	-0.0722	-4.01	0.0000	0.0043	0.18	0.8540	-0.1002	-5.42	0.0000
N		135,406			135,406			135,406	
Pseudo R-squared		0.0167			0.0258			0.0130	

Panel C: *Pr(Period 4 = 1)*

	all forecast revisions			upward revisions			downward revisions		
Variables	parameter estimate	Wald Chi-Square	Pr > ChiSquare	parameter estimate	Wald Chi-Square	Pr > ChiSquare	parameter estimate	Wald Chi-Square	Pr > ChiSquare
Intercept	-0.2435	-2.88	0.0040	-0.4757	-4.26	0.0000	-0.1501	-1.76	0.0780
FirmEXP	0.0044	0.16	0.8710	0.0483	1.25	0.2120	-0.0074	-0.23	0.8210
GenEXP	0.0569	1.70	0.0890	0.0026	0.06	0.9510	0.0669	1.58	0.1130
Industries	-0.1667	-5.62	0.0000	-0.2023	-4.53	0.0000	-0.1484	-4.40	0.0000
Prior_Accuracy	0.2079	11.01	0.0000	0.2452	8.42	0.0000	0.1412	6.23	0.0000
Broker_Size	0.5735	14.79	0.0000	0.5976	11.75	0.0000	0.5689	14.08	0.0000
Companies	-0.0103	-0.29	0.7720	0.0307	0.62	0.5350	-0.0197	-0.46	0.6460
DaysElapsed	-1.3692	-21.95	0.0000	-1.6264	-23.98	0.0000	-1.2191	-17.80	0.0000
NumForecast	0.4013	8.05	0.0000	0.3968	5.73	0.0000	0.3682	7.75	0.0000
MV	0.0307	3.34	0.0010	0.0605	4.97	0.0000	0.0265	2.71	0.0070
AbsChg_EPS	0.0360	1.71	0.0880	-0.0983	-3.41	0.0010	0.0633	3.03	0.0020
N		135,406			135,406			135,406	
Pseudo R-squared		0.0879			0.1131			0.0738	

Table 4: continued

Panel D: *Pr(Period 5 = 1)*

	all forecast revisions			upward revisions			downward revisions		
Variables	parameter estimate	Wald Chi-Square	Pr > ChiSquare	parameter estimate	Wald Chi-Square	Pr > ChiSquare	parameter estimate	Wald Chi-Square	Pr > ChiSquare
Intercept	-2.9888	-23.35	0.0000	-3.4049	-17.87	0.0000	-2.7431	-19.99	0.0000
FirmEXP	-0.0401	-0.82	0.4110	0.0477	0.63	0.5300	-0.0923	-1.54	0.1240
GenEXP	0.0298	0.56	0.5750	0.0286	0.34	0.7300	0.0294	0.43	0.6700
Industries	-0.0172	-0.28	0.7760	0.0342	0.40	0.6910	-0.0523	-0.79	0.4300
Prior_Accuracy	0.1298	3.39	0.0010	0.2805	4.84	0.0000	0.0282	0.57	0.5710
Broker_Size	0.1632	3.54	0.0000	0.3627	4.94	0.0000	0.0381	0.67	0.5010
Companies	-0.0245	-0.40	0.6870	-0.0898	-1.08	0.2810	0.0169	0.22	0.8240
DaysElapsed	-0.6708	-10.40	0.0000	-0.7058	-8.74	0.0000	-0.6421	-8.58	0.0000
NumForecast	0.0905	1.54	0.1240	0.1106	1.37	0.1690	0.0654	1.10	0.2730
MV	0.0462	3.25	0.0010	0.0735	3.68	0.0000	0.0319	2.19	0.0290
AbsChg_EPS	-0.0421	-1.34	0.1800	-0.0782	-1.59	0.1110	-0.0308	-0.89	0.3740
N		135,406			135,406			135,406	
Pseudo R-squared		0.0099			0.0158			0.0079	

Table 5: Relative Forecast Error, Forecast Timing, and Analyst Characteristics

This table reports the results from the regression of relative forecast error on forecast timing as well as analyst characteristics. *RFE* (relative forecast error) is the absolute value of an individual analyst's forecast error minus the absolute value of mean consensus forecast error measured one day prior to the analyst's forecast revision. Consensus forecast is measured as the average of each analyst's most recent forecast issued since EAD_{q-1}. For trading days 0 and 1 after EAD_{q-1}, we compute consensus forecast including forecasts issued between EAD_{q-2} and EAD_{q-1}.

The regression models (1) and (3) employ the continuous event time variable and the models (2) and (4) employ discrete event time periods. In models (1) and (3), *RT* is the number of days since EAD_{q-1}, scaled to range from 0 to 1. In models (2) and (4), the timing of forecast revisions is grouped into five periods as follows: [Period 1: days (0, 1) (announcement period of quarter q-1 earnings); Period 2: days (2, 6) (immediate post-announcement period of quarter q-1 earnings); Period 3: days (7, 32) (non-immediate post-announcement period of quarter q-1 earnings); Period 4: days (-30, -6) (non-immediate pre-announcement period of quarter q earnings); Period 5: days (-5, -1) (immediate pre-announcement period of quarter q earnings)] where quarter q is the quarter for which earnings are being forecasted. Trading days 0 through 32 are measured as the number of trading days relative to the prior quarter earnings announcement date (EAD_{q-1}), and trading days -30 through -1 are measured as the number of trading days relative to the current quarter earnings announcement (EAD_q). *Period 2* (*Period 3, Period 4, Period 5*) takes value of 1 if the forecast revision is issued during Period 2 (Period 3, Period 4, Period 5), and 0 otherwise.

FirmEXP (scaled firm experience) is the number of quarters of firm-specific experience for each analyst, scaled to range from 0 to 1; *GenEXP* (scaled general experience) is the number of quarters of career experience for each analyst, scaled to range from 0 to 1; *Industries* (scaled number of industries following) is the number of two-digit SIC industries the analyst follows in the year, scaled to range from 0 to 1; *Prior_Accuracy* (scaled prior period forecast accuracy) is the forecast accuracy of the analyst's last forecast for *q-1* quarter EPS, scaled to range from 0 to 1; *Broker_ Size* (scaled brokerage firm size) is the number of analysts in the analyst's brokerage firm in the year, scaled to range from 0 to 1; *Companies* (scaled number of companies following) is the number of companies the analyst follows in the year, scaled to range from 0 to 1; *DaysElapsed* (scaled number of days elapsed since the last forecast) is the number of days since any analyst's prior forecast, scaled to range from 0 to 1; *Numforecast* is log of the number of quarterly EPS forecasts issued by the analyst since EAD_{q-1}. *MV* is the log of the market value of equity of the firm at the end of fiscal quarter *q-1*; *AbsChgEPS* is the absolute value of the difference between quarter *q-1* and quarter *q-5* actual EPS, deflated by the absolute value of quarter *q-5* EPS. All variables except *Numforecast*, *MV*, and *AbsChgEPS* are scaled to range from 0 to 1 for each firm-quarter.

All test statistics and significance levels are calculated based on the standard errors adjusted by a two-dimensional cluster at the firm and year levels.

Table 5: continued

Panel A: All forecast revisions

	model (1)			model (2)			model (3)			model (4)		
Variables	parameter estimate	t-value	Pr > |t|	parameter estimate	t-value	Pr > |t|	parameter estimate	t-value	Pr > |t|	parameter estimate	t-value	Pr > |t|
Intercept	-0.0096	-5.82	0.0000				-0.0293	-5.56	0.0000			
RT	-0.0194	-10.45	0.0000				-0.0120	-6.24	0.0000			
Period2				0.0011	1.30	0.1930				-0.0178	-3.50	0.0000
Period3				-0.0072	-5.02	0.0000				-0.0230	-4.57	0.0000
Period4				-0.0432	-18.07	0.0000				-0.0565	-11.21	0.0000
Period5				-0.0248	-8.22	0.0000				-0.0400	-6.98	0.0000
FirmEXP							-0.0032	-1.89	0.0590	-0.0033	-1.89	0.0590
GenEXP							0.0020	1.17	0.2420	0.0025	1.48	0.1390
Industries							-0.0008	-0.56	0.5780	-0.0020	-1.34	0.1810
Prior_Accuracy							-0.0136	-11.72	0.0000	-0.0121	-10.58	0.0000
Broker_Size							-0.0168	-8.83	0.0000	-0.0134	-7.10	0.0000
Companies							0.0073	4.44	0.0000	0.0071	4.33	0.0000
DaysElapsed							0.0158	7.71	0.0000	0.0063	2.95	0.0030
NumForecast							-0.0176	-9.52	0.0000	-0.0139	-7.97	0.0000
MV							0.0042	8.20	0.0000	0.0046	9.25	0.0000
AbsChg_EPS							-0.0179	-9.80	0.0000	-0.0175	-9.71	0.0000
N		135,406			135,406			135,406			135,406	
Adjusted R-squared		0.0022			0.0314			0.0181			0.0443	
t-test p-values:												
period2 = period3					<.0001						<.0001	
period2 = period4					<.0001						<.0001	
period2 = period5					<.0001						<.0001	
period3 = period4					<.0001						<.0001	
period3 = period5					<.0001						<.0001	
period4 = period5					<.0001						<.0001	

Table 5: continued

Panel B: Upward revisions

	model (1)			model (2)			model (3)			model (4)		
Variables	parameter estimate	t-value	Pr > |t|	parameter estimate	t-value	Pr > |t|	parameter estimate	t-value	Pr > |t|	parameter estimate	t-value	Pr > |t|
Intercept	0.0009	0.75	0.4550				0.0136	3.17	0.0020			
RT	-0.0215	-11.95	0.0000				-0.0190	-10.05	0.0000			
Period2				-0.0007	-0.74	0.4610				0.0075	1.68	0.0930
Period3				-0.0012	-0.74	0.4570				0.0076	1.81	0.0700
Period4				-0.0237	-10.76	0.0000				-0.0137	-3.24	0.0010
Period5				-0.0206	-7.11	0.0000				-0.0106	-2.08	0.0370
FirmEXP							-0.0076	-4.45	0.0000	-0.0076	-4.44	0.0000
GenEXP							0.0030	1.59	0.1110	0.0028	1.49	0.1370
Industries							-0.0015	-0.84	0.4010	-0.0019	-1.07	0.2850
Prior_Accuracy							-0.0120	-7.19	0.0000	-0.0115	-6.82	0.0000
Broker_Size							-0.0163	-8.44	0.0000	-0.0155	-7.91	0.0000
Companies							0.0061	3.02	0.0030	0.0060	3.00	0.0030
DaysElapsed							0.0025	1.22	0.2210	0.0018	0.90	0.3680
NumForecast							0.0020	0.93	0.3510	0.0036	1.73	0.0840
MV							-0.0002	-0.35	0.7250	0.0004	0.92	0.3550
AbsChg_EPS							-0.0058	-3.45	0.0010	-0.0058	-3.36	0.0010
N		53,233			53,233			53,233			53,233	
Adjusted R-squared		0.0049			0.0148			0.0098			0.0195	
t-test p-values:												
period2 = period3					0.0450						0.8590	
period2 = period4					<.0001						<.0001	
period2 = period5					<.0001						<.0001	
period3 = period4					<.0001						<.0001	
period3 = period5					<.0001						<.0001	
period4 = period5					0.5242						0.2086	

Table 5: continued

Panel C: Downwards revisions

	model (1)			model (2)			model (3)			model (4)		
Variables	parameter estimate	t-value	Pr > |t|	parameter estimate	t-value	Pr > |t|	parameter estimate	t-value	Pr > |t|	parameter estimate	t-value	Pr > |t|
Intercept	-0.0177	-6.70	0.0000				-0.0537	-6.98	0.0000			
RT	-0.0156	-5.49	0.0000				-0.0068	-2.47	0.0140			
Period2				0.0026	1.83	0.0670				-0.0305	-4.04	0.0000
Period3				-0.0114	-5.49	0.0000				-0.0402	-5.60	0.0000
Period4				-0.0531	-17.71	0.0000				-0.0786	-10.77	0.0000
Period5				-0.0273	-6.64	0.0000				-0.0554	-6.54	0.0000
FirmEXP							-0.0007	-0.29	0.7690	-0.0008	-0.33	0.7400
GenEXP							0.0020	0.84	0.4010	0.0030	1.26	0.2060
Industries							-0.0001	-0.04	0.9700	-0.0015	-0.67	0.5040
Prior_Accuracy							-0.0133	-7.72	0.0000	-0.0120	-7.03	0.0000
Broker_Size							-0.0176	-6.67	0.0000	-0.0126	-4.72	0.0000
Companies							0.0067	2.80	0.0050	0.0064	2.64	0.0080
DaysElapsed							0.0235	8.24	0.0000	0.0100	3.32	0.0010
NumForecast							-0.0282	-11.21	0.0000	-0.0239	-9.85	0.0000
MV							0.0064	8.66	0.0000	0.0068	9.37	0.0000
AbsChg_EPS							-0.0222	-9.73	0.0000	-0.0217	-9.72	0.0000
N		82,173			82,173			82,173			82,173	
Adjusted R-squared		0.0011			0.0406			0.0246			0.0593	
t-test p-values:												
period2 = period3					<.0001						<.0001	
period2 = period4					<.0001						<.0001	
period2 = period5					<.0001						<.0001	
period3 = period4					<.0001						<.0001	
period3 = period5					<.0001						<.0001	
period4 = period5					<.0001						<.0001	

Table 6: Analyst Characteristics, Forecast Timing, and Return Sensitivity to Forecast Revisions

This table presents the results from the regression of stock price response on forecast revision interacted with event-time dummies and analyst characteristics. We measure the stock price response to earnings forecast revision, *R(t, t+2)*, as the cumulative abnormal stock returns over three day window from day t through day t+2. *FR (*Forecast revision*)* is the change in an individual analyst's quarterly EPS forecast scaled by absolute value of old forecast and multiplied by 100. *FR* is truncated at ±50%. The timing of forecast revisions is grouped into three periods as follows: [*D1* (days (7, 32) and days (-30, -6)); *D2* (days (-5, -1)), and *D3* (days (2, 6))]. Trading days 0 through 32 are measured as the number of trading days relative to the prior quarter earnings announcement date (EAD_{q-1}), and trading days -30 through -1 are measured as the number of trading days relative to the current quarter earnings announcement (EAD_q) where quarter q is the quarter for which earnings are being forecasted. *D1* (*D2, D3*) takes value of 1 if the forecast revision is issued during Period *D1* (*D2*, *D3*), and 0 otherwise.

FirmEXP (scaled firm experience) is the number of quarters of firm-specific experience for each analyst, scaled to range from 0 to 1; *GenEXP* (scaled general experience) is the number of quarters of career experience for each analyst, scaled to range from 0 to 1; *Industries* (scaled number of industries following) is the number of two-digit SIC industries the analyst follows in the year, scaled to range from 0 to 1; *Prior_Accuracy* (scaled prior period forecast accuracy) is the forecast accuracy of the analyst's last forecast for *q-1* quarter EPS, scaled to range from 0 to 1; *Broker_ Size* (scaled brokerage firm size) is the number of analysts in the analyst's brokerage firm in the year, scaled to range from 0 to 1; *Companies* (scaled number of companies following) is the number of companies the analyst follows in the year, scaled to range from 0 to 1; *DaysElapsed* (scaled number of days elapsed since the last forecast) is the number of days since any analyst's prior forecast, scaled to range from 0 to 1; *Numforecast* is log of the number of quarterly EPS forecasts issued by the analyst since EAD_{q-1}. *MV* is the log of the market value of equity of the firm at the end of fiscal quarter *q-1*; *AbsChgEPS* is the absolute value of the difference between quarter *q-1* and quarter *q-5* actual EPS, deflated by the absolute value of quarter *q-5* EPS. All variables except *Numforecast*, *MV*, and *AbsChgEPS* are scaled to range from 0 to 1 for each firm-quarter.

For the interaction between *FR* and analyst characteristics in model (4), we use dummy variables of analyst characteristics, each of which is 1 if the scaled analyst characteristic variable has a value greater than 0.5, and zero otherwise. Note that each scaled variable ranges from 0 to 1.

All test statistics and significance levels are calculated based on the standard errors adjusted by a two-dimensional cluster at the firm and year levels.

Table 6: continued

Panel A: All forecast revisions

	model (1)			model (2)			model (3)			model (4)		
Variables	parameter estimate	t-value	Pr > |t|	parameter estimate	t-value	Pr > |t|	parameter estimate	t-value	Pr > |t|	parameter estimate	t-value	Pr > |t|
Intercept	0.0755	2.03	0.0420	-0.3256	-1.96	0.0500	-0.3456	-2.08	0.0370	-0.3103	-1.89	0.0590
*D1*FR*	0.0277	10.08	0.0000	0.0265	9.64	0.0000	0.0265	9.63	0.0000	0.0209	6.07	0.0000
*D2*FR*	0.0267	4.05	0.0000	0.0252	3.85	0.0000	0.0252	3.85	0.0000	0.0200	3.00	0.0030
*D3*FR*	0.0072	2.48	0.0130	0.0067	2.32	0.0200	0.0067	2.32	0.0210	0.0022	0.71	0.4800
FirmEXP							-0.0514	-1.45	0.1480			
GenEXP							-0.0042	-0.11	0.9160			
Industries							0.0917	2.91	0.0040			
Prior_Accuracy							-0.0118	-0.35	0.7240			
Broker_Size							0.0290	0.76	0.4460			
Companies							-0.0334	-1.02	0.3090			
*FR*DFirmEXP*										0.0039	1.99	0.0470
*FR*DGenEXP*										-0.0053	-2.06	0.0390
*FR*DIndustries*										-0.0005	-0.24	0.8120
*FR*DPrior_Accuracy*										0.0037	1.77	0.0760
*FR*DBroker_Size*										0.0146	5.65	0.0000
*FR*DCompanies*										0.0014	0.58	0.5590
DaysElapsed				0.1546	1.94	0.0530	0.1556	1.97	0.0490	0.1550	1.95	0.0510
NumForecast				-0.1427	-2.92	0.0040	-0.1398	-2.92	0.0040	-0.1379	-2.83	0.0050
MV				0.0474	2.61	0.0090	0.0503	2.73	0.0060	0.0454	2.51	0.0120
AbsChg_EPS				-0.0795	-2.24	0.0250	-0.0788	-2.24	0.0250	-0.0804	-2.27	0.0230
N		121,574			121,574			121,574			121,574	
Adjusted R-squared		0.0070			0.0078			0.0079			0.0083	
t-test p-values:												
D1*FR = D2*FR		0.1380			0.7532			0.7340			0.8042	
D1*FR = D3*FR		<.0001			<.0001			<.0001			<.0001	
D2*FR = D3*FR		<.0001			<.0001			<.0001			<.0001	

Table 6: continued

Panel B: Upward revisions

	model (1)			model (2)			model (3)			model (4)		
Variables	parameter estimate	t-value	Pr > |t|	parameter estimate	t-value	Pr > |t|	parameter estimate	t-value	Pr > |t|	parameter estimate	t-value	Pr > |t|
Intercept	0.3561	8.24	0.0000	0.4760	2.48	0.0130	0.3288	1.61	0.1060	0.4363	2.24	0.0250
*D1*FR*	0.0140	3.67	0.0000	0.0146	3.80	0.0000	0.0145	3.78	0.0000	0.0080	1.95	0.0510
*D2*FR*	0.0413	5.55	0.0000	0.0419	5.51	0.0000	0.0412	5.40	0.0000	0.0347	4.18	0.0000
*D3*FR*	-0.0064	-0.91	0.3620	-0.0010	-0.15	0.8770	-0.0008	-0.13	0.9000	-0.0071	-0.89	0.3730
FirmEXP							-0.0297	-0.59	0.5560			
GenEXP							-0.0954	-1.56	0.1200			
Industries							-0.0060	-0.12	0.9030			
Prior_Accuracy							0.0545	1.31	0.1920			
Broker_Size							0.3084	5.32	0.0000			
Companies							0.0398	0.83	0.4040			
*FR*DFirmEXP*										0.0015	0.37	0.7120
*FR*DGenEXP*										-0.0068	-1.66	0.0970
*FR*DIndustries*										0.0065	1.39	0.1660
*FR*DPrior_Accuracy*										0.0080	2.19	0.0290
*FR*DBroker_Size*										0.0135	3.55	0.0000
*FR*DCompanies*										-0.0028	-0.63	0.5260
DaysElapsed				-0.3100	-3.30	0.0010	-0.2913	-3.13	0.0020	-0.3038	-3.29	0.0010
NumForecast				0.0364	0.50	0.6180	-0.0045	-0.06	0.9510	0.0187	0.26	0.7990
MV				0.0179	0.87	0.3840	0.0288	1.35	0.1780	0.0228	1.08	0.2800
AbsChg_EPS				-0.1217	-2.08	0.0370	-0.1198	-2.07	0.0380	-0.1217	-2.12	0.0340
N		48,521			48,521			48,521			48,521	
Adjusted R-squared		0.0019			0.0026			0.0035			0.0033	
t-test p-values:												
*D1*FR = D2*FR*		<.0001			<.0001			<.0001			<.0001	
*D1*FR = D3*FR*		<.0001			<.0001			<.0001			<.0001	
*D2*FR = D3*FR*		<.0001			<.0001			<.0001			<.0001	

Table 6: continued

Panel C: Downward revisions

	model (1)			model (2)			model (3)			model (4)		
Variables	parameter estimate	t-value	Pr > |t|	parameter estimare	t-value	Pr > |t|	parameter estimate	t-value	Pr > |t|	parameter estimate	t-value	Pr > |t|
Intercept	-0.1458	-3.91	0.0000	-0.9212	-4.07	0.0000	-0.8609	-3.89	0.0000	-0.8756	-3.92	0.0000
*D1*FR*	0.0185	6.40	0.0000	0.0142	4.61	0.0000	0.0141	4.57	0.0000	0.0106	2.47	0.0130
*D2*FR*	0.0056	0.64	0.5240	0.0012	0.13	0.8950	0.0013	0.15	0.8830	-0.0019	-0.21	0.8320
*D3*FR*	-0.0026	-0.50	0.6190	-0.0004	-0.08	0.9380	-0.0001	-0.01	0.9920	-0.0031	-0.58	0.5640
FirmEXP							-0.0693	-1.66	0.0960			
GenEXP							0.0684	1.60	0.1090			
Industries							0.1557	3.92	0.0000			
Prior_Accuracy							-0.0490	-1.21	0.2270			
Broker_Size							-0.1597	-3.84	0.0000			
Companies							-0.0937	-2.12	0.0340			
*FR*DFirmEXP*										0.0049	1.72	0.0850
*FR*DGenEXP*										-0.0049	-1.70	0.0900
*FR*DIndustries*										-0.0044	-1.51	0.1310
*FR*DPrior_Accuracy*										0.0012	0.44	0.6620
*FR*DBroker_Size*										0.0135	4.43	0.0000
*FR*DCompanies*										0.0036	1.09	0.2760
DaysElapsed				0.4753	5.29	0.0000	0.4712	5.28	0.0000	0.4728	5.31	0.0000
NumForecast				-0.2410	-4.28	0.0000	-0.2121	-3.73	0.0000	-0.2189	-3.83	0.0000
MV				0.0657	2.82	0.0050	0.0629	2.71	0.0070	0.0595	2.56	0.0110
AbsChg_EPS				-0.0730	-1.75	0.0810	-0.0731	-1.75	0.0800	-0.0751	-1.80	0.0710
N		73,053			73,053			73,053			73,053	
Adjusted R-squared		0.0022			0.0043			0.0048			0.0049	
t-test p-values:												
D1*FR = D2*FR		0.0991			0.0043			0.0050			0.0062	
D1*FR = D3*FR		<.0001			<.0001			<.0001			<.0001	
D2*FR = D3*FR		0.0012			0.7534			07885			0.8121	

Table 7: Results with the Sample of All Forecast Revisions

This table presents the results based on the sample that includes *all* analyst forecast revisions during the quarter.

RT is the number of days since EAD_{q-1}, scaled to range from 0 to 1; *FirmEXP* (scaled firm experience) is the number of quarters of firm-specific experience for each analyst, scaled to range from 0 to 1; *GenEXP* (scaled general experience) is the number of quarters of career experience for each analyst, scaled to range from 0 to 1; *Industries* (scaled number of industries following) is the number of two-digit SIC industries the analyst follows in the year, scaled to range from 0 to 1; *Prior_Accuracy* (scaled prior period forecast accuracy) is the forecast accuracy of the analyst's last forecast for *q-1* quarter EPS, scaled to range from 0 to 1; *Broker_ Size* (scaled brokerage firm size) is the number of analysts in the analyst's brokerage firm in the year, scaled to range from 0 to 1; *Companies* (scaled number of companies following) is the number of companies the analyst follows in the year, scaled to range from 0 to 1; *DaysElapsed* (scaled number of days elapsed since the last forecast) is the number of days since any analyst's prior forecast, scaled to range from 0 to 1; *Numforecast* is log of the number of quarterly EPS forecasts issued by the analyst since EAD_{q-1}. *MV* is the log of the market value of equity of the firm at the end of fiscal quarter *q-1*; *AbsChgEPS* is the absolute value of the difference between quarter *q-1* and quarter *q-5* actual EPS, deflated by the absolute value of quarter *q-5* EPS. All variables except *Numforecast*, *MV*, and *AbsChgEPS* are scaled to range from 0 to 1 for each firm-quarter.

RFE (relative forecast error) is the absolute value of an individual analyst's forecast error minus the absolute value of mean consensus forecast error measured one day prior to the analyst's forecast revision. Consensus forecast is measured as the average of each analyst's most recent forecast issued since EAD_{q-1}. For trading days 0 and 1 after EAD_{q-1}, we compute consensus forecast including forecasts issued between EAD_{q-2} and EAD_{q-1}.

R(t, t+2) is the cumulative abnormal stock returns over three day window from day t through day t+2. *FR (*Forecast revision*)* is the change in an individual analyst's quarterly EPS forecast scaled by absolute value of old forecast and multiplied by 100. *FR* is truncated at ±50%. In the return sensitivity regression, the timing of forecast revisions is grouped into three periods as follows: [*D1* (days (7, 32) and days (-30, -6)); *D2* (days (-5, -1)), and *D3* (days (2, 6))]. Trading days 0 through 32 are measured as the number of trading days relative to the prior quarter earnings announcement date (EAD_{q-1}), and trading days -30 through -1 are measured as the number of trading days relative to the current quarter earnings announcement (EAD_q) where quarter q is the quarter for which earnings are being forecasted. *D1* (*D2, D3*) takes value of 1 if the forecast revision is issued during Period *D1* (*D2*, *D3*), and 0 otherwise. For the interaction between *FR* and analyst characteristics in the return sensitivity to forecast revision regression, we use dummy variables of analyst characteristics, each of which is 1 if the scaled analyst characteristic variable has a value greater than 0.5, and zero otherwise. Note that each scaled variable ranges from 0 to 1.

All test statistics and significance levels are calculated based on the standard errors adjusted by a two-dimensional cluster at the firm and year levels.

Table 7: continued

	Dependent Variable = *RT*			Dependent Variable = *RFE*			Dependent Variable = *R(t, t+2)*		
Variables	parameter estimate	t-value	Pr > |t|	parameter estimate	t-value	Pr > |t|	parameter estimate	t-value	Pr > |t|
Intercept	0.7706	57.10	0.0000	-0.0288	-5.43	0.0000	-0.3625	-2.39	0.0170
RT				-0.0178	-8.28	0.0000			
*D1*FR*							0.0303	8.49	0.0000
*D2*FR*							0.0241	4.53	0.0000
*D3*FR*							0.0038	1.35	0.1770
FirmEXP	0.0036	1.03	0.3020	-0.0016	-0.98	0.3280			
GenEXP	0.0002	0.04	0.9640	-0.0002	-0.11	0.9090			
Industries	-0.0145	-4.10	0.0000	-0.0013	-0.91	0.3630			
Prior_Accuracy	0.0222	8.81	0.0000	-0.0134	-11.65	0.0000			
Broker_Size	0.0664	12.63	0.0000	-0.0158	-9.86	0.0000			
Companies	0.0074	1.52	0.1280	0.0091	5.07	0.0000			
*FR*DFirmEXP*							0.0014	0.86	0.3900
*FR*DGenEXP*							-0.0060	-2.65	0.0080
*FR*DIndustries*							0.0000	-0.02	0.9840
*FR*DPrior_Accuracy*							0.0039	2.05	0.0410
*FR*DBroker_Size*							0.0128	5.24	0.0000
*FR*DCompanies*							0.0020	0.88	0.3780
DaysElapsed	-0.2644	-24.62	0.0000	0.0084	4.61	0.0000	0.2203	2.80	0.0050
NumForecast	0.1216	25.42	0.0000	-0.0162	-10.64	0.0000	-0.0691	-1.30	0.1930
MV	-0.0124	-9.29	0.0000	0.0049	9.44	0.0000	0.0445	2.90	0.0040
AbsChg_EPS	-0.0115	-4.51	0.0000	-0.0169	-8.81	0.0000	-0.0648	-1.69	0.0920
N		201,422			201,422			182,486	
Adjusted R-squared		0.0980			0.0187			0.0124	

t-test p-values:	
D1*FR = D2*FR	0.0305
D1*FR = D3*FR	<0.001
D2*FR = D3*FR	<0.001

Table 8: Results with the Sample of Analysts' Last Forecast Revisions

This table presents the results based on the sample that includes only the *last* forecast revision by each analyst during a quarter.

RT is the number of days since EAD_{q-1}, scaled to range from 0 to 1; *FirmEXP* (scaled firm experience) is the number of quarters of firm-specific experience for each analyst, scaled to range from 0 to 1; *GenEXP* (scaled general experience) is the number of quarters of career experience for each analyst, scaled to range from 0 to 1; *Industries* (scaled number of industries following) is the number of two-digit SIC industries the analyst follows in the year, scaled to range from 0 to 1; *Prior_Accuracy* (scaled prior period forecast accuracy) is the forecast accuracy of the analyst's last forecast for *q-1* quarter EPS, scaled to range from 0 to 1; *Broker_ Size* (scaled brokerage firm size) is the number of analysts in the analyst's brokerage firm in the year, scaled to range from 0 to 1; *Companies* (scaled number of companies following) is the number of companies the analyst follows in the year, scaled to range from 0 to 1; *DaysElapsed* (scaled number of days elapsed since the last forecast) is the number of days since any analyst's prior forecast, scaled to range from 0 to 1; *Numforecast* is log of the number of quarterly EPS forecasts issued by the analyst since EAD_{q-1}. *MV* is the log of the market value of equity of the firm at the end of fiscal quarter *q-1*; *AbsChgEPS* is the absolute value of the difference between quarter *q-1* and quarter *q-5* actual EPS, deflated by the absolute value of quarter *q-5* EPS. All variables except *Numforecast*, *MV*, and *AbsChgEPS* are scaled to range from 0 to 1 for each firm-quarter.

RFE (relative forecast error) is the absolute value of an individual analyst's forecast error minus the absolute value of mean consensus forecast error measured one day prior to the analyst's forecast revision. Consensus forecast is measured as the average of each analyst's most recent forecast issued since EAD_{q-1}. For trading days 0 and 1 after EAD_{q-1}, we compute consensus forecast including forecasts issued between EAD_{q-2} and EAD_{q-1}.

R(t, t+2) is the cumulative abnormal stock returns over three day window from day t through day t+2. *FR (*Forecast revision*)* is the change in an individual analyst's quarterly EPS forecast scaled by absolute value of old forecast and multiplied by 100. *FR* is truncated at ±50%. In the return sensitivity regression, the timing of forecast revisions is grouped into three periods as follows: [*D1* (days (7, 32) and days (-30, -6)); *D2* (days (-5, -1)), and *D3* (days (2, 6))]. Trading days 0 through 32 are measured as the number of trading days relative to the prior quarter earnings announcement date (EAD_{q-1}), and trading days -30 through -1 are measured as the number of trading days relative to the current quarter earnings announcement (EAD_q) where quarter q is the quarter for which earnings are being forecasted. *D1* (*D2, D3*) takes value of 1 if the forecast revision is issued during Period *D1* (*D2*, *D3*), and 0 otherwise. For the interaction between *FR* and analyst characteristics in the return sensitivity to forecast revision regression, we use dummy variables of analyst characteristics, each of which is 1 if the scaled analyst characteristic variable has a value greater than 0.5, and zero otherwise. Note that each scaled variable ranges from 0 to 1.

All test statistics and significance levels are calculated based on the standard errors adjusted by a two-dimensional cluster at the firm and year levels.

Table 8: continued

	Dependent Variable = *RT*			Dependent Variable = *RFE*			Dependent Variable = *R(t, t+2)*		
Variables	parameter estimate	t-value	Pr > |t|	parameter estimare	t-value	Pr > |t|	parameter estimate	t-value	Pr > |t|
Intercept	0.7597	56.40	0.0000	-0.0513	-8.46	0.0000	-0.3304	-2.10	0.0360
RT				0.0068	2.23	0.0260			
*D1*FR*							0.0314	7.92	0.0000
*D2*FR*							0.0246	4.62	0.0000
*D3*FR*							0.0043	1.36	0.1740
FirmEXP	-0.0001	-0.03	0.9760	-0.0001	-0.08	0.9400			
GenEXP	-0.0038	-0.78	0.4360	0.0001	0.03	0.9770			
Industries	-0.0184	-5.13	0.0000	-0.0020	-1.28	0.2010			
Prior_Accuracy	0.0255	9.39	0.0000	-0.0141	-11.73	0.0000			
Broker_Size	0.0184	4.28	0.0000	-0.0112	-6.68	0.0000			
Companies	0.0167	3.39	0.0010	0.0091	4.77	0.0000			
*FR*DFirmEXP*							0.0000	0.01	0.9930
*FR*DGenEXP*							-0.0060	-2.50	0.0120
*FR*DIndustries*							-0.0004	-0.20	0.8430
*FR*DPrior_Accuracy*							0.0042	2.01	0.0450
*FR*DBroker_Size*							0.0127	5.09	0.0000
*FR*DCompanies*							0.0027	1.17	0.2440
DaysElapsed	-0.2202	-24.95	0.0000	0.0089	4.85	0.0000	0.1998	2.46	0.0140
NumForecast	0.3347	67.31	0.0000	-0.0395	-17.39	0.0000	-0.0013	-0.02	0.9850
MV	-0.0158	-11.26	0.0000	0.0062	10.84	0.0000	0.0406	2.49	0.0130
AbsChg_EPS	-0.0130	-5.04	0.0000	-0.0183	-9.27	0.0000	-0.0493	-1.15	0.2510
N		159,797			159,797			144,527	
Adjusted R-squared		0.2255			0.0269			0.0129	

t-test p-values:	
D1*FR = D2*FR	0.0201
D1*FR = D3*FR	<0.001
D2*FR = D3*FR	<0.001