# Who is Afraid of Reg FD? The Behavior and Performance of Sell-Side Analysts Following the SEC's Fair Disclosure Rules

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# Who is Afraid of Reg FD? The Behavior and Performance of Sell-Side Analysts Following the SEC's Fair Disclosure Rules


**Abstract**

This paper analyzes the impact of Regulation FD on the accuracy and dispersion of earnings forecasts made by sell-side equity analysts. Using a large sample of forecasts made over a nearly ten-year period surrounding FD's adoption, we uncover two main sets of findings. First, earnings forecasts become less accurate post-FD at the levels of both the individual analyst and the consensus. This effect is significantly larger for early forecasts than for late forecasts, and for smaller companies than for larger companies. Second, the dispersion in earnings forecasts across individual analysts following a company increases post-FD. This effect is also larger for early forecasts than for late forecasts, and it increases with the passage of time following FD's adoption. These results are quite robust to alternative empirical methodologies. Our findings suggest that there has been a reduction in both selective guidance and the quality of analyst forecasts post-FD.



JEL classification: G14, K22, L51, M4

Keywords: Reg FD, Regulation Fair Disclosure, Fair Disclosure rules, Brokerage analysts, Sell-side analysts, Security analysts, Analyst forecasts

# Who is Afraid of Reg FD? The Behavior and Performance of Sell-Side Analysts Following the SEC's Fair Disclosure Rules

## 1. Introduction

On August 10, 2000, the U.S. Securities and Exchange Commission (SEC) approved a set of 'fair disclosure' rules, generally referred to as 'Reg FD'. Effective October 23, 2000, these rules require a company to reveal any 'material' information to all investors and to analysts simultaneously in case of intentional disclosures, or within 24 hours in case of unintentional disclosures. These rules are intended to put an end to the practice of selective disclosure, whereby companies give Wall Street analysts and large shareholders crucial earnings and business information prior to making it public. The rules prohibit companies from tipping off some favored analysts, investors, and media outlets before others. Like existing insider trading rules, these new rules are aimed at leveling the playing field for all investors.

This paper empirically assesses the impact of Reg FD on the accuracy and dispersion of analysts' earnings forecasts. We use univariate tests and fixed effects panel regressions to examine a large sample of forecasts over a nearly ten-year period surrounding FD's adoption. We investigate whether FD's effects vary by forecast age, firm size, and industry. Finally, we examine the evolution of FD's effects over time.

Our paper builds on valuable early work on Reg FD by Bailey, Li, Mao and Zhang (2003) and Heflin, Subramanyam and Zhang (2003). Both papers examine a range of issues affected by FD, including changes in the accuracy of consensus analyst forecasts, and changes in forecast dispersion. Both studies perform univariate tests to analyze forecast accuracy and dispersion; Heflin et al. also conduct cross-sectional regressions using matched-pairs samples.[1] Our paper contributes to this literature in several ways. First, unlike the broad scope adopted by prior studies, we focus specifically

[1]Related research examines FD's effects on analyst following and forecast dispersion (e.g., Irani and Karamanou (2003)); trading costs around earnings announcements (e.g., Eleswarapu et al. (2004)); the price impact of analyst forecasts and recommendations (e.g., Gintschel and Markov (2004)); and the information content of bond rating changes (Jorion, Liu and Shi (2005)).

on changes in forecast accuracy and dispersion. We perform a detailed empirical analysis of these two consequences of Reg FD using fixed effects panel regressions that allow us to abstract from forecast seasonality and from analyst and company characteristics. Second, while prior studies analyze only the latest forecasts issued just before earnings release, we analyze both early and late forecasts. If managers enjoy a greater information advantage over analysts when an earnings release is far in the future, there is more room for selective disclosure early on. By the time earnings are publicly released, managers usually have little information advantage left over the market,[2] so there may be little room for selective disclosure. Third, while prior studies analyze the short-run effects of Reg FD based on three quarters of post-FD data, we analyze its medium-term effects based on 15 quarters of post-FD data. This allows us to examine how FD's effects change over time, as analysts and companies adjust to the new regulatory environment. Fourth, we investigate differences across several interesting sub-samples (such as small firms and firms in certain industries) where earnings guidance was more likely pre-FD. Finally, we examine the accuracy of individual analyst forecasts as well as consensus forecasts.

We have two main sets of findings. First, analyst forecasts become less accurate following the adoption of fair disclosure rules. This effect is found both at the individual analyst level and at the level of the consensus (i.e., the median across all analysts). We find that this effect is significantly larger for early forecasts than for late forecasts, and for smaller companies than for larger companies. Second, analyst forecasts become more dispersed following Reg FD. This effect is also larger for early forecasts than for late forecasts. The effect is relatively small in the first year following FD's adoption, but it increases significantly over the following three years. These results are robust to alternative empirical methodologies. Our findings suggest that there has been a reduction in both selective guidance and the quality of analyst forecasts post-FD.

The paper proceeds as follows. Section 2 describes the sample and data. Section 3 presents our tests and results on forecast accuracy, and section 4 deals with forecast dispersion. Section 5 concludes the paper.

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[2]Indeed, Heflin et al. (Table 3) find that the average magnitude of the surprise in earnings per share relative to the latest consensus forecast just before earnings release was only about 3 cents on a $10 stock pre-FD.

## 2. Data and sample

Sections 2.1 through 2.3 discuss, respectively, the origins of Reg FD, our data sources, and the sample.

### 2.1 Origins of the rules

The first public hint of the SEC's concern with selective guidance came in a speech by its then-Chairman Arthur Levitt on February 27, 1998 (SEC 1998a). He reiterated his concern with the practice at a speech on September 28, 1998 (SEC 1998b).[3] A year later, the SEC formally proposed the fair disclosure rules on December 15, 1999. The rules were open for public comment until March 29, 2000. Despite intense opposition by analysts, brokerage firms and companies, the rules were approved by the SEC on August 10, 2000 and became effective on October 23, 2000.[4]

### 2.2 Data

We analyze earnings forecasts for quarters ending between March 1995 and June 2004, a nearly ten year period surrounding the adoption of the rules. Almost all of the data for this study come from the Institutional Brokers Estimate System (I/B/E/S) detail and summary history databases, except for data on special items of earnings (described in footnote 14 below), which are obtained from Compustat. To simplify presentation of the results, we limit the sample to firms with fiscal years ending in March, June, September or December.

For each quarter, we examine the latest forecast issued by an analyst within an early forecast period and a late forecast period. The early period is the two-month period ending the day before a quarter begins. The late period consists of the two month period ending the day before earnings release. Figure 1 depicts the timing of these forecast

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[3]Levitt (SEC 1998b) described the practice as follows: "Through conference calls or embargoed press releases, analysts and institutional investors often hear about material news before it is made public. In the interval, there is a great deal of unusual trading." And (SEC 1998a), "Well, it doesn't take Oliver Stone to imagine how that might come about."

[4]Could the rules have had an effect prior to their formal adoption? While this is a possibility, it seems unlikely. From all accounts, before the rules were adopted, there was considerable uncertainty about their passage. Nonetheless, we repeated all our subsequent tests using the pre-1998 period as our pre-FD benchmark. These results are generally quite similar to those presented in the paper.

periods for the quarter ending June 30 for a firm that releases earnings on July 15. In our sample of individual analyst forecasts, the median age of the early and late forecasts at the time of earnings release is 150 days and 28 days, respectively (see Table 4, Panel A).

Companies usually start announcing the results for a quarter beginning about two weeks after the quarter ends. Analysts following a company issue forecasts for a given quarter starting about a year before earnings release; as the release date approaches, more analysts issue forecasts, and some analysts revise their forecasts. Obviously, with the passage of time, forecasts become more accurate as more information becomes available. We choose forecast periods of two months each in order to have a meaningful number of analysts issuing forecasts during each interval and to ensure that those analysts are on a roughly equal footing as to the quantity and quality of information available to them.

**2.3 Sample**

We conduct multiple tests of each of the two issues discussed in section 2. For each test, we analyze individual analyst and consensus (median) forecasts made during each of the two forecast periods discussed in section 2.2 above. Each test is based on the maximum data available for the test. Therefore, sample sizes sometimes vary across the tables.

Table 1 gives a flavor for how sample sizes are determined for the tests presented below in section 3.2 for the early forecast period (i.e., for the regressions shown in columns 1 and 3 of Table 4). As column 1 of Table 1 shows, individual analysts made a total of 760,087 forecasts of quarterly earnings over our sample period. Out of these, we focus on the latest forecast made by each analyst during our early forecast period. There are a total of 275,140 such forecasts, out of which stock price data are available for 252,823 forecasts. Out of these, the stock price is $1 or more in 252,270 cases. Of these cases, the normalized forecast error (NFE, defined in section 3.1.1 below) is 2 or less in 246,728 cases, out of which data is available for all the variables in Table 4 regressions for 179,729 cases. This is the sample size shown in column 1 of Table 4. Column 2 of Table 1 similarly shows how we arrive at the sample size for the consensus (median) of analyst forecasts in the regression in column 3 of Table 4.

Table 2 shows descriptive statistics of our sample of early forecasts made by individual analysts. The median actual earnings per share (EPS) is 23 cents. The median ratio of EPS to the stock price at the beginning of our early forecast period is about 1.1%, and the median absolute forecast error is about 0.23% of the stock price. About 43% of the observations of forecasts occur post-FD. The median age of the forecasts in the sample is 150 days, corresponding to the natural log of one plus the age (LAGE) of 5.0173. About 19% of the EPS observations are negative (LOSS=1). EPS declines relative to the same quarter of the previous year (DECLINE=1) in about 40% of the cases. The median absolute change in EPS relative to the same quarter of the previous year (SHOCK) is about 0.45%.

The typical (median) sample company has a market capitalization of about $536 million, sales of about $104 million, total assets of about $624 million, and is followed by five analysts. The median standard deviation of analyst EPS forecasts is about 0.1% of the stock price at the beginning of the forecast period and about 5.6% of the mean forecast.

## 3. Forecast accuracy

The first issue we investigate is whether analyst forecast errors (absolute differences between actual and forecasted EPS) change following Reg FD. With the adoption of Reg FD, the job of predicting earnings may become harder for analysts because the rules prohibit companies from making pre-announcement disclosures to analysts. This implies that analysts' forecast errors should increase post-FD, unless (1) SEC enforcement of the rules is ineffective, (2) companies increase disclosure via public channels (e.g., conference calls and news releases), or (3) analysts develop alternate information sources (such as customers, suppliers, employees, or industry groups). We examine this issue both at the level of the individual analyst as well as at the level of the consensus forecast.

Sections 3.1 to 3.3 present, respectively, the results of univariate tests, fixed effects regressions, and robustness checks. Section 3.4 examines three interesting partitions of our sample, and section 3.5 compares our results with prior FD research.

### 3.1. Univariate tests

Before we control for other factors that may affect forecast accuracy, it is useful to perform a simple 'before versus after' comparison. Sections 3.1.1 and 3.1.2 present, respectively, the results of univariate tests for individual analyst and consensus forecasts.

#### 3.1.1. Individual analysts

We define the normalized forecast error for analyst i following company j for forecast period t as follows:

$$NFE_{ijt} = | e_{jt} - \hat{e}_{ijt} | / p_{jt} \qquad (1)$$

where $e_{jt}$ equals the earnings per share (EPS) for company j for quarter t, $\hat{e}_{ijt}$ equals the latest estimate of $e_{jt}$ by analyst i during a given forecast period, and $p_{jt}$ equals the latest available stock price preceding the forecast period.

We choose the stock price rather than EPS to normalize forecast errors to avoid the inference problems caused by division by zero or by a negative EPS number. Given that our sample period consists of a nearly ten-year period over which both EPS and stock prices fluctuate widely, we normalize forecast errors by the stock price at the beginning of the forecast period rather than a constant stock price measured at a single point in time. To avoid the problem of inflated forecast errors caused by division by very small numbers, we omit NFE observations associated with stock prices less than \$1. We also omit observations where NFE $\geq$ 2.

Table 3 reports the average values of normalized forecast errors for matched-pairs (pre vs. post-FD) of individual analyst forecasts. We present these values separately for each of the two forecast periods for the March, June, September and December quarters.[5] For each forecast period, the column labeled 'Post' shows the mean (median) value of NFE across all analyst-company pairs during the post-FD quarters. The column labeled 'Pre' shows the corresponding pre-FD period values for the same analyst-company pairs.

[5]We compute these values as follows. For a given forecast period for a given quarter (such as the late forecast period for quarters ending in December), we first compute the mean NFE pre-FD and the mean NFE post-FD for each analyst-company pair in our sample. We then use these mean values across all analyst-company pairs to compute the mean and median values shown in Table 3. This approach gives equal weight to each analyst-company pair in the sample.

The sample includes all analyst-company pairs in the I/B/E/S database that have at least one NFE observation pre-FD and one observation post-FD. For early forecasts, the pre-FD period consists of quarters ending between March 1995 to December 2000, and the post-FD period consists of quarters ending between March 2001 and June 2004. For late forecasts, the pre-FD period consists of quarters ending between March 1995 and June 2000, and the post-FD period consists of quarters ending between December 2000 and June 2004.[6]

The first two columns of Panel A show that the mean value of the normalized forecast error increases following Reg FD in both forecast periods for each of the four quarters. The p-value for the matched-pairs t-test, shown in column 3, is less than .0001 in all eight cases. The magnitude of the increase in mean NFE ranges from 76% to 168%, and has a mean of 106% across the eight cases. Not surprisingly, late forecasts are substantially more accurate than early forecasts. The average NFE for the former is about one-half as large as the average NFE of the latter.

In columns 4 and 5, the median NFE following Reg FD also increases in all eight cases. All the differences are statistically significant at the .0001 level using a matched-pairs Wilcoxon signed-ranks test. The magnitude of the increase in median values is considerably lower, ranging from 20% to 60%, with a mean of 39%.

### 3.1.2. Consensus Forecast

We next define the normalized consensus forecast error for company j for forecast period t as

$$NFE_{jt} = | e_{jt} - \hat{e}_{jt} | / p_{jt} \qquad (2)$$

where $\hat{e}_{jt}$ equals the latest consensus (median) of all analyst forecasts of $e_{jt}$ made within a given forecast window, and other variables are as defined in section 3.1.1 above. Once again, forecasts with stock price under $1 or NFE of 2 or greater are excluded.

[6] We omit the late forecast period for the quarter ending September 2000. That period includes periods both before and after October 23, 2000 for the majority of our sample firms, making it difficult to classify as either pre- or post-FD.

Panel B of Table 3 presents the mean and median values of normalized consensus forecast errors for matched-pairs (pre and post-FD) of companies. Columns 1 and 2 show that the mean NFE increases following Reg FD in both forecast periods for all four quarters; the p-value is less than .0001 in all cases. The increase ranges from 36% to 185%, with a mean of 132%.

Columns 4 and 5 show that the median forecast error also increases in all eight cases. The increase is statistically significant in all cases with a Wilcoxon test p-value of less than .0001. The increase ranges from 22% to 43%, and has a mean value of 30%.

**3.2 Fixed effects regressions**

The evidence in Table 3 suggests that forecast errors for a firm increase post-FD, both at the level of individual analysts and the consensus. However, Table 3 does not control for other factors that can affect the accuracy of analyst forecasts, such as characteristics of analysts and companies. In order to control for these influences, we next estimate the following cross-sectional time-series regression of normalized forecast errors:

$$NFE_{ijt} = b_1\, REGFD_t + b_2\, LAGE_{ijt} + b_3\, LOSS_{jt} + b_4\, DECLINE_{jt} + b_5\, SHOCK_{jt} + u_{ijt} \quad (3)$$

where NFE is as defined as in section 3.1.1 above. The indicator variable $REGFD_t$ equals one if the forecast period for a quarter occurs during the post-FD period, and zero otherwise. The variable $LAGE_{ijt}$ equals ln ($AGE_{ijt}$ + 1), where $AGE_{ijt}$ is the number of days between the forecast date and earnings release. The indicator variable $LOSS_{jt}$ equals 1 if $e_{jt}<0$, and 0 otherwise. The indicator variable $DECLINE_{jt}$ equals 1, if $e_{jt} < e_{j,t-4}$, and 0 otherwise. The variable $SHOCK_{jt}$ equals $|e_{jt} - e_{j,t-4}| / p_{jt}$. We omit observations where $p_{jt} <$ \$1 or $NFE_{ijt} \geq 2$. The sample period is from January 1995 to June 2004.[7]

Since we are interested in examining the effect of Reg FD on forecast errors, rather than in assessing the usual determinants of forecast errors, we use a model with analyst-company-quarter fixed effects.[8] This involves subtracting from each variable in

[7]As discussed in footnote 6 above, we omit the late forecast period for the quarter ending September 2000.

[8]Prior studies (e.g., Clement (1999)) have also used the fixed effects model to examine analyst forecasts. See Wooldridge (2002) for a detailed exposition of the fixed effects model.

equation (3) its mean value for an analyst i following a company j for the relevant quarter during the sample period.[9] By treating analyst-company-quarter effects as fixed, we do not try to explain what determines the accuracy of analyst forecasts in general (such as characteristics of analysts and companies).[10] Instead, our panel data and the fixed effects model allow us to largely abstract from that question. In other words, given our panel data, treating analyst-company-quarter effects as fixed allows us to control for differences in characteristics across individual analysts (such as age, experience, education and intrinsic ability) and companies (such as age, location, state of incorporation, industry and NYSE size decile) that remain relatively stable over time. It also controls for seasonal differences in forecast accuracy. In these and all subsequent regressions in the paper, we report robust t-statistics from a heteroskedasticity-autocorrelation consistent estimator.

Including analyst-company-quarter fixed effects, however, does not control for characteristics of earnings shocks experienced by a company, nor does it control for forecast age. These variables can be important determinants of forecast accuracy. For example, prior research (e.g., Brown (2001)) finds striking differences in analysts' forecast accuracy for profits versus losses. Hence we control for that effect by including LOSS as an explanatory variable in equation (3). Similarly, earnings may be harder to forecast when they decline, or when they change substantially, relative to the same quarter of the prior year. We control for these possibilities by including the DECLINE and SHOCK variables in equation (3). Finally, forecasts are more likely to be accurate the closer they are to earnings release. The LAGE variable in equation (3) is intended to control for this effect.

This regression allows us to focus on the consequences of Reg FD. A positive coefficient on REGFD would imply that post-FD, forecast errors tend to increase above their normal levels for a given analyst tracking a given company for a given quarter (such

[9]This is mathematically equivalent to adding a dummy variable for each analyst following a given company for a given quarter to the right hand side of equation (3) (see Wooldridge (2002)).

[10]See Mikhail, Walther and Willis (1997), Clement (1999), and Jacob, Lys and Neale (1999) for some excellent work on that topic.

as the December-ending quarter). As with the univariate tests reported above, we estimate equation (3) separately for forecasts made during each of the two forecast periods.

Panel A of Table 4 shows the results of this estimation at the level of individual analyst forecasts for both forecast periods.[11] The estimated coefficient ($\hat{b}_1$) of the REGFD dummy is positive and highly statistically significant for both periods. Thus, forecasts of individual analysts become less accurate following the adoption of fair disclosure rules. The magnitude of this effect is non-trivial. For early forecasts, $\hat{b}_1$ equals .0023. For a \$10 stock, this implies an average increase in absolute earnings forecast error of 2.3 cents per share post-FD. The corresponding increase for late forecasts works out to only 1.3 cents per share. This difference is statistically significant, with a p-value less than .001. These results indicate that analysts are less informed post-FD, particularly early on in a quarter.

Panel B shows the corresponding regressions for consensus forecasts. Here, there is only one NFE observation per company for each time period. Hence, we use a model with company-quarter fixed effects. These results largely mirror those of Panel A.[12] The coefficient of REGFD is positive and highly statistically significant for both early and late forecasts, with the difference being insignificant. The results indicate that the consensus of analyst forecasts also becomes less accurate following Reg FD.

As expected, forecast errors increase with the age of the forecast. Consistent with earlier studies (e.g., Brown (2001)), we find that forecast errors are substantially larger for loss-making firms than for profitable firms, and errors increase with the magnitude of the earnings shock. Forecast errors are also larger for firms with earnings declines vs. other firms. Estimated coefficients of the LAGE, LOSS, SHOCK and DECLINE variables are positive and generally statistically significant.[13]

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[11]In all fixed effects regressions reported in the paper, tests of the null hypothesis that all unobserved effects are jointly zero yield p-values less than .0001.

[12]The results are also similar when we winsorize all continuous variables in the regression at the first and $99^{th}$ percentiles of the sample.

[13]We also examine the effect of negative special items of earnings as in Heflin, et al. (2003). We define a variable NEGSPEC as the absolute value of special items (from Compustat) divided by total assets, if special items are negative, and 0 otherwise. In the process of merging our I/B/E/S dataset with Compustat, sample sizes decrease significantly. Nevertheless, when we add NEGSPEC as an explanatory variable, its coefficient estimate turns out to be insignificant in all four regressions. Importantly, its addition does not

### 3.3 Sub-sample results

We next examine, in sections 3.3.1 through 3.3.3, whether post-FD changes in forecast accuracy differ across three interesting partitions of our sample based on firm size, industry, and post-FD time period. In each case, we estimate variants of equation (3) and treat analyst-company-quarter effects (or, in the case of consensus forecasts, company-quarter effects) as fixed.

#### 3.3.1 Firm size

We first examine whether small companies may have engaged more in selective disclosure pre-FD in order to attract and retain analyst coverage. If so, we would expect post-FD declines in forecast accuracy to be especially pronounced for these firms. To examine this effect, we estimate the following panel regression:

$$NFE_{ijt} = b_{1S}\, REGFD_t * SMALL_j + b_{1L}\, REGFD_t * LARGE_j + b_2\, LAGE_{ijt} + b_3\, LOSS_{jt} + b_4\, DECLINE_{jt} + b_5\, SHOCK_{jt} + u_{ijt} \quad (4)$$

where $SMALL_j$ equals 1 if the market value of equity of company j is below the sample median for the relevant forecast period in the middle year of the sample period; it equals zero otherwise. $LARGE_j$ equals 1 - $SMALL_j$. The remaining variables are as defined in section 3.2 above. Estimating equation (4) allows us to test for the equality of the effect of Reg FD on small versus large firms.

Panel A in Part I of Table 5 shows that individual analyst forecast errors increase significantly following Reg FD for both small and large firms for both forecast periods, with no significant difference between small and large firms. The results for consensus forecasts shown in Panel B of Part I generally mirror those in Panel A. But here, the post-FD increase in forecast errors is significantly bigger for small firms than for large firms, for both early and late forecasts.

change the sign or significance of the other variables. To save space, we do not report these results in a table.

### 3.3.2 Industry effect

If earnings guidance provided by managers is generally informative, then post-FD forecast accuracy should be expected to decline more in industries where guidance was more likely pre-FD. Hutton (2003) argues that before FD, managers were more likely to provide detailed guidance to analysts when earnings were more important to valuation but harder to forecast, and when intangible assets comprised a large part of total assets. This description appears to fit two of the eleven I/B/E/S 2-digit Sector/Industry/Group (SIG) industry sectors: technology (SIG=08) and consumer services (04).[14] On that basis, we would expect the effect of Reg FD to be more pronounced for companies in these two sectors. We define a variable for industries where guidance was more likely, GMLIND, to equal 1 if a firm's 2-digit SIG code is 04 or 08, and 0 otherwise. Similarly, we define a variable for industries where guidance was less likely, GLLIND, to equal 1 – GMLIND. We then estimate a panel regression that is similar to equation (4) above, except that we replace the SMALL and LARGE variables by GMLIND and GLLIND, respectively.

Part II of Table 5 shows the coefficient estimates from this regression. The increase in forecast errors is not significantly different across the two groups of industries for late forecasts. For early forecasts, contrary to our expectation, the increase in forecast errors is significantly larger for firms in industries where guidance was less likely pre-FD (GLLIND = 1) than in other industries.

### 3.3.3. Post-FD time period

We next examine how FD's effects change over time as analysts and companies adjust to the new regulatory environment. This is ultimately an empirical issue. We can distinguish between two contrasting views. One possibility is that FD's effects on forecast errors may be greater in the immediate aftermath of its adoption as the flow of private information from companies to analysts gets cut off. With the passage of time, as companies find newer ways to communicate with analysts (either via public channels, or privately, if SEC enforcement slacks off) and as analysts develop alternative sources of

[14]The other industry sectors are: finance (01), healthcare (02), consumer non-durables (03), consumer durables (05), energy (06), transportation (07), basic industries (09), capital goods (10) and public utilities (11).

information (e.g., industry groups, customers, suppliers or employees) the effects of FD might dampen. Alternatively, private communication between companies and analysts may fall to some extent immediately upon FD's adoption, and then decline further as SEC enforcement increases.

We divide our roughly four-year post-FD period into the first post-FD year and subsequent years, and replace the SMALL and LARGE variables in equation (4) by two variables: FIRST and LATER. FIRST equals 1 for the first post-FD year (i.e., the first four post-FD quarters for each forecast period), 0 otherwise. LATER equals 1 for the subsequent years, 0 otherwise. The results are shown in Part III of Table 5.

We find that the post-FD increase in forecast errors is not confined to the period immediately following FD's adoption. Indeed, the coefficient of REGFD is positive and generally statistically significant not only for the first post-FD year, but also for subsequent years. For late consensus forecasts, the magnitude of the increase is quite large in the first year, but declines significantly after that. For individual analysts' forecasts, the opposite pattern holds.

### 3.4 Comparison with prior FD research

Heflin et al. (2003) examine changes in consensus forecast errors using a sample of three quarters of post-FD data and three quarters of pre-FD data. Their Table 4 reports the results of cross-sectional regressions for a sample of pre- and post-FD observations for a group of companies. The regressions reported in Panel B of our Table 4 use a panel dataset with six years of pre-FD data and nearly four years of post-FD data and treat company effects as fixed. The company-quarter fixed effects model and our panel dataset allow us to abstract from cross-sectional differences in fixed company characteristics and seasonality that might affect forecast accuracy. Our approach focuses on differences in forecast errors for a firm over time relative to its time-series mean. Like Heflin, et al., we control for forecast age and several characteristics of a firm's earnings shocks that can be expected to vary from period to period.

But while Heflin et al. examine the latest consensus forecast for a firm made just before earnings release, we examine the latest forecast made over two periods of two months each. As discussed in section 2.2, our early forecast period ends the day before the quarter begins; the late forecast period ends the day before earnings release.[15] In addition, Heflin et al. point out (p. 5) that their sample is biased toward larger firms. To compare results using our fixed effects panel regression methodology with those of Heflin et al., we next examine errors for the latest consensus forecasts and subdivide the sample into small and large firms. For the purpose of this comparison, we restrict our post-FD sample to the first three post-FD quarters, as in Heflin, et al.

Despite differences in methodology, our results both confirm and extend those of Heflin, et al. We find no increase in forecast errors for the type of forecast they examine, namely the latest consensus forecast made before earnings release by large firms. However, we find a significant increase for consensus forecasts that are made earlier, or that are made for small firms. For the overall sample of both small and large firms, consensus forecast errors increase significantly both for our early and late forecasts. The pattern is similar for individual analyst forecasts. To save space, these results are not shown in a table. Furthermore, while Heflin et al. provide early evidence on FD's effects from three post-FD quarters, we examine its medium-term effects over several years post-FD. We find that with the passage of time, the effect of FD on individual analysts' forecast errors increases, but the effect on consensus forecast errors decreases (see Part III of Table 5). FD also has had a greater effect on consensus forecast errors for small firms than for large firms over this four year period (see Part I of Table 5).

## 4. Forecast dispersion

We next examine changes in the dispersion of analyst forecasts post-FD. Since a company can no longer guide analysts to a precise earnings number, analysts now have to rely on their individual analyses. This is likely to result in more dispersed forecasts unless the rules are not effectively enforced or unless companies substitute more public disclosure for private analyst guidance.

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[15]The median ages of our early and late consensus forecasts, shown in columns 3 and 4 of Table 4, are 131 days and 14 days, respectively. The latter is comparable to the median age of 22 (=$e^{3.091}$) days reported in Heflin et al.'s Table 4, Panel A.

We present the results of univariate tests in section 4.1 and fixed effects regressions in section 4.2. Section 4.3 presents the results for three interesting partitions of our sample.

**4.1 Univariate tests**

We compute the coefficient of variation of analysts' forecasts of EPS for company j for forecast period t as

$$COV_{jt} = \sigma_{jt} / | \bar{X}_{jt} |, \qquad (5)$$

where $\sigma_{jt}$ and $\bar{X}_{jt}$ equal, respectively, the standard deviation and the mean of the forecasts of all analysts following the company. Observations are excluded if there are fewer than three analysts following a company or if $\bar{X}_{jt} < \$0.10$.

Table 6 shows the mean and median COV values pre and post-FD for matched-pairs of firms. These values are shown for both forecast periods separately for each quarter.[16] The pre- and post-FD periods for the two forecast windows are as defined in section 3.1.1 above. The sample includes all companies in the I/B/E/S database that have at least one COV observation pre-FD and one observation post-FD.

Columns 1 and 2 of Table 6 show that the mean COV increases post-FD for both forecast periods in each of the four quarters; the difference is statistically significant at the 5% level or better in all periods except for late forecasts for the December and March quarters. Columns 4 and 5 show a similar pattern. The median COV increases in all periods; the difference is always statistically significant except for late forecasts in the December quarter.

**4.2 Fixed effects regressions**

The results in Table 6 suggest that the dispersion of analyst forecasts for a firm increases post-FD. However, Table 6 does not account for systematic differences in firm characteristics that can affect the dispersion of analyst forecasts. To control for these

[16]We compute these values as follows. Within a given forecast period for a given quarter, we first compute the mean COV pre-FD and the mean COV post-FD for each company over all the years that the company exists in our sample. We then use these mean values across all companies to compute the mean and median values shown in Table 6. This approach gives equal weight to each company in the sample.

characteristics, we next estimate the following cross-sectional time-series regression of the dispersion of analyst forecasts:

$$DISPERSION_{jt} = b_1\, REGFD_t + b_2\, LAGE_{jt} + b_3\, LOSS_{jt} + b_4\, DECLINE_{jt} + b_5\, SHOCK_{jt} + u_{jt} \qquad (6)$$

where DISPERSION equals the normalized standard deviation (NSD) or the coefficient of variation (COV). Specifically, $NSD_{jt} = \sigma_{jt} / p_{jt}$, where $\sigma_{jt}$ is the standard deviation corresponding to the latest consensus forecast of EPS for company j during a given forecast period of a given quarter t from the I/B/E/S Summary History file, and $p_{jt}$ is the latest available stock price preceding the forecast period. $LAGE_{jt}$ is the natural log of one plus the age of the latest consensus forecast (i.e., the number of days between earnings release and the date that the standard deviation is computed), and the remaining variables are defined as in sections 3.2 and 4.1 above. The sample period is January 1995 to June 2004; the quarter ending September 2000 is excluded for the late forecast period. The early and late forecast periods are defined as in section 2.2 above. Observations are excluded if there are fewer than three analysts following a company or if $p_{jt} < 1$ (for NSD) or $\overline{X}_{jt} < \$0.10$ (for COV).

In estimating equation (6), we treat company-quarter effects as fixed. As in our analysis of forecast accuracy, we are not interested in explaining variation across firms in the normal level of forecast dispersion. Instead, we focus on whether forecast dispersion changes in response to Reg FD after controlling for the normal level of dispersion for each company over the sample period. The company-quarter fixed effects estimate of equation (8) allows us to abstract from the effects of fixed firm characteristics that affect forecast dispersion. As in equation (3), we control for forecast age and for potential differences in characteristics of earnings shocks for a firm (LOSS, DECLINE and SHOCK).

We estimate equation (6) separately for both forecast periods for each of our two measures of dispersion. Table 7 shows that the normalized standard deviation (NSD) of analyst forecasts increases following Reg FD for both forecast periods; the coefficient of variation (COV) increases for early forecasts only. The coefficient of the REGFD variable is positive and statistically significant in these three estimations.[17] For early forecasts, the magnitude of the post-FD increase in forecast standard deviation is about 1.7% of the mean absolute forecast error.

Consistent with our expectations, dispersion is positively related to forecast age. Forecast dispersion is also related to the characteristics of earnings shocks experienced by a company. For both the NSD and COV measures, forecasts of losses exhibit far more dispersion than do forecasts of profits in both forecast periods. Companies that experience an earnings decline (relative to the same quarter of the prior year) have greater COV but lower NSD.[18]

**4.3 Sub-sample results**

We next examine whether post-FD changes in forecast dispersion differ based on firm size, industry, and post-FD time period. In each case, we estimate variants of equation (6) and treat company-quarter effects as fixed.

**4.3.1 Firm size**

As discussed in section 3.3.1, small firms may have engaged more in selective disclosure pre-FD in order to attract and retain analyst coverage. To the extent that this is true, we would expect the post-FD increase in forecast dispersion to be more pronounced in small firms. We examine this issue by estimating the following panel regression:

$$DISPERSION_{jt} = b_{1S}\, REGFD_t * SMALL_j + b_{1L}\, REGFD_t * LARGE_j + b_2\, LAGE_{jt} + b_3\, LOSS_{jt} + b_4\, DECLINE_{jt} + b_5\, SHOCK_{jt} + u_{jt} \qquad (7)$$

where the variables are as defined in sections 3.2, 3.3.1 and 4.2 above.

Part I of Table 8 shows estimates of equation (7). The normalized standard deviation (NSD) increases following Reg FD for both small and large firms, but there is no evidence of a greater increase for small firms than for large firms. The coefficient of

[17]These results are qualitatively similar when we winsorize all continuous variables in the regression at the first and 99th percentiles of the sample.

variation (COV) increases for early forecasts for large firms, and decreases for late forecasts for small firms. Once again, there is no evidence of a greater post-FD increase in dispersion for small firms than for large firms.

#### 4.3.2 Industry

We next examine whether FD has a more pronounced effect on forecast dispersion in industries where guidance was more likely pre-FD. We estimate a panel regression similar to equation (7) above, except that we replace the SMALL and LARGE variables by the GMLIND and GLLIND variables, respectively. The latter two variables are as defined in section 3.3.2 above.

Part II of Table 8 shows that for early forecasts, both measures of dispersion increase post-FD for both groups of industries, with no significant difference between the two industry groups. For late forecasts, NSD increases only for industries where guidance was less likely pre-FD. There is no increase in COV for either industry group.

#### 4.3.3. Post-FD time period

Finally, we examine how FD's effects on forecast dispersion change over time as analysts and companies adjust to the new regulatory environment. We replace the SMALL and LARGE variables in equation (7) by two variables, FIRST and LATER, as defined in section 3.3.3 above. The results are shown in Part III of Table 8.

We find that the post-FD increase in NSD is not confined to the period immediately following FD's adoption. NSD generally increases significantly in the first post-FD year as well as subsequent years. But the increase is significantly bigger for the latter years. For the early forecast period, there is a similar pattern for COV. For late forecasts, there is no increase in COV post-FD.

### 4.4 Comparison with prior FD research

Prior research finds mixed results on post-FD changes in forecast dispersion across analysts. While Irani and Karamanou (2003)) find that dispersion increases, Heflin

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[18]In untabulated regressions, we add an explanatory variable measuring negative special items, NEGSPEC, as defined in footnote 14 above. The coefficient of this variable is statistically insignificant and its addition

et al. (2003) find that it does not. To compare our dispersion results with the results of prior research that examines late forecasts for large firms, we restrict our post-FD sample period to the first three quarters after FD's adoption. We then re-estimate regressions similar to those in Part I in Panel A of Table 8. Our results are consistent with those of Heflin et al. for the sample period and type of forecasts that they examine. In particular, we find no significant increase in NSD for late forecasts for either large or small firms. However, for early forecasts, we find a significant increase in forecast dispersion for both small and large firms, an effect not examined in prior research. To save space, these results are not shown in a table. Furthermore, while prior studies provide early evidence on Reg FD's adoption based on three quarters of data, we examine its medium-term effects over nearly a four-year post-FD period. As discussed in section 4.3.3 above, we find that the magnitude of the increase in analyst forecast dispersion (NSD) increases with the passage of time after FD's adoption.

## 5. Summary and concluding remarks

This paper analyzes changes in the behavior and performance of sell-side equity analysts following the October 2000 implementation of the SEC's fair disclosure rules. These rules place severe restrictions on one-on-one communication between a company and a market participant such as an analyst or an investor. Generally referred to as Reg FD, these rules ban the practice of 'selective guidance,' where a company provides future earnings or other crucial business information to analysts and large investors without simultaneously releasing it to all investors. Advocated by the then SEC chairman Arthur Levitt, these new rules, like existing insider trading rules, are intended to level the playing field for all investors.

We analyze a large sample of individual analyst and consensus forecasts of earnings over a roughly ten-year period surrounding the adoption of Reg FD. We perform panel regressions that treat analyst-company-quarter effects (for individual analyst forecasts) or company-quarter effects (for consensus forecasts) as fixed, and that control for forecast age and several characteristics of companies' earnings shocks. We investigate whether FD's impact differs for early versus late forecasts, or for small versus

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does not change the sign or significance of the coefficient of REGFD.

large companies. We also examine how FD's effects evolve over time as analysts and companies adjust to the new regulatory environment.

We have two main sets of findings. First, earnings forecasts become less accurate following Reg FD, both at the level of the individual analyst and the consensus. For individual analysts, the magnitude of this effect is significantly larger for early forecasts than for late forecasts. Prior research on the short-run impact of Reg FD (e.g., Heflin, et al. (2003)) finds that by the time earnings are released, analyst forecasts post-FD are essentially no less accurate than they were pre-FD. We find that the story is quite different for forecasts made earlier. Our point estimate indicates that for a $10 stock, the latest EPS forecast made by an individual analyst over a two-month period before the beginning of a quarter (the 'early forecast period') is about 2.3 cents less accurate post-FD than it was pre-FD. The magnitude of this effect declines significantly - by almost one-half - for the latest forecast made over the two-month period before earnings release (the 'late forecast period').

For consensus forecasts, the post-FD decrease in forecast accuracy is even more striking for smaller firms. For firms in the bottom half of our sample by market capitalization, the corresponding decrease in EPS forecast accuracy for late forecasts is as much as 4.5 cents compared to only 0.7 cents for firms in the top half of the sample. For consensus forecasts, the magnitude of this effect is quite large in the first post-FD year, but it later declines substantially. For late forecasts, the figure is 4 cents for the first post-FD year, declining to an average of 1.6 cents over the following three years. For individual analysts, the effect starts out as small, then increases with the passage of time.

In our second set of findings, individual analysts following a company are more dispersed in their earnings forecasts post-FD. The magnitude of this effect is larger for early forecasts than for late forecasts. The evolution of the post-FD change in forecast dispersion displays an interesting pattern. The increase in dispersion starts out as a relatively small effect in the first post-FD year, and then it increases substantially over the following three years. In the absence of direct, one-on-one communication from company management that can point all analysts to a common EPS number, analysts increasingly arrive at forecasts that are different from each other. Overall, our findings suggest that there has been a reduction in both selective guidance and the quality of analyst forecasts post-FD.

While this research has examined changes in the behavior and performance of sell-side analysts over the medium-term following the adoption of Reg FD, an analysis of the long-term effects of these rules will also be interesting. Of course, far more time needs to pass before such analysis becomes feasible. Detailed knowledge of the long history of interactions between analysts and companies will be useful in putting the effects of the new rules in perspective. For instance, how old is the practice of selective earnings guidance? How was information transmitted from companies to analysts and investors before the advent of selective guidance? And how does the post-FD equilibrium differ from that in the pre-selective guidance era? All of these are interesting questions for future research.

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**Figure 1**

**Timing of Forecast Periods for the Quarter Ending June 30 for a firm that Releases Earnings on July 15**

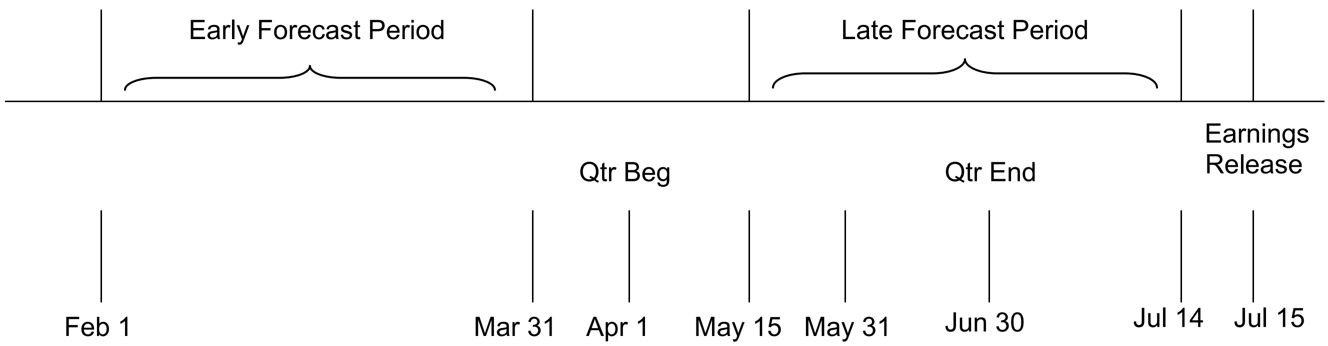

**Table 1**

**Sample Selection Criteria**

The table shows the number of individual and consensus forecasts in the I/B/E/S database that satisfy various data requirements. The early forecast period is the two-month period ending the day before a quarter begins. Normalized forecast error (NFE) is as defined in Table 2. The sample sizes in item 6 of the table correspond to the regressions shown in columns 1 and 3 of Table 4.

| | **Number of Forecasts** | |
|---|---|---|
| | Individual Forecasts | Consensus Forecasts |
| 1. All quarterly forecasts over the sample period | 760,087 | 570,774 |
| 2. Latest forecasts made during the early forecast period | 275,140 | 129,539 |
| 3. Item 2 with stock price available before early period | 252,823 | 124,114 |
| 4. Item 3 with stock price not less than $1 | 252,270 | 123,106 |
| 5. Item 4 with NFE <= 2 | 246,728 | 117,470 |
| 6. Item 5 with data available on all variables in Table 4 regressions | 179,729 | 80,512 |

## Table 2

### Descriptive Statistics of Individual Forecasts for the Early Forecast Period

The table shows summary statistics of earnings per share (EPS), normalized EPS, normalized forecast errors (NFE), measures of forecast dispersion, firm size, analyst following, and explanatory variables in the regressions of NFE and forecast dispersion. $NFE_{ijt} = \left| e_{jt} - \hat{e}_{ijt} \right| / p_{jt}$ where $e_{jt}$ is the EPS for company j for quarter t, $\hat{e}_{ijt}$ is analyst i's latest forecast of $e_{jt}$ during the early forecast period (defined in Table 1), and $p_{jt}$ is the latest available stock price preceding the forecast period. $REGFD_t$ equals 1 if the forecast period for a quarter occurs during the post-FD period, and 0 otherwise; $LAGE_{ijt}$ is the natural logarithm of one plus the number of days between a forecast and the earnings report; $LOSS_{jt}$ equals 1 if $e_{jt} < 0$ and 0 otherwise; $DECLINE_{jt}$ equals 1 if $e_{jt} < e_{j,t-4}$ and 0 otherwise; and $SHOCK_{jt} = | e_{jt} - e_{j,t-4} | / p_{jt}$. Normalized standard deviation is defined as $NSD_{jt} = \sigma_{jt}/p_{jt}$, where $\sigma_{jt}$ is the standard deviation of analysts' forecasts. The coefficient of variation is defined as $COV_{jt} = \sigma_{jt} / \left| \overline{X}_{jt} \right|$, where $\overline{X}_{jt}$ is the mean of analysts' forecasts. The sample excludes observations where $p_{jt} < 1$ or $NFE_{ijt} \geq 2$. The sample period consists of quarters ending between March 1995 and June 2004.

**Table 2 (cont.)**

| **Variable** | Mean | Median | Q1 | Q3 | Std. Dev. | N | Unit of Observation |
|---|---|---|---|---|---|---|---|
| Actual EPS ($) | 0.2603 | 0.2300 | 0.0500 | 0.4500 | 6.7061 | 246,728 | Forecast |
| Actual EPS / Stock price at beginning of period | 0.0055 | 0.0111 | 0.0031 | 0.0186 | 0.0507 | 246,728 | Forecast |
| NFE | 0.0084 | 0.0023 | 0.0007 | 0.0068 | 0.0339 | 246,728 | Forecast |
| REGFD | 0.4329 | 0 | 0 | 1 | 0.4955 | 246,728 | Forecast |
| LAGE | 5.0087 | 5.0173 | 4.8828 | 5.1299 | 0.1699 | 246,713 | Forecast |
| LOSS | 0.1901 | 0 | 0 | 0 | 0.3924 | 246,728 | Forecast |
| DECLINE | 0.3954 | 0 | 0 | 1 | 0.4889 | 179,918 | Forecast |
| SHOCK | 0.0114 | 0.0045 | 0.0020 | 0.0110 | 0.0418 | 179,738 | Forecast |
| Market Capitalization ($ millions) | 3915.92 | 535.80 | 166.16 | 1872.10 | 16725.45 | 83,629 | Company-Quarter |
| Sales ($ millions) | 691.76 | 103.79 | 28.37 | 400.10 | 2452.78 | 76,830 | Company-Quarter |
| Assets ($ millions) | 6993.74 | 624.32 | 158.64 | 2547.90 | 37134.05 | 76,651 | Company-Quarter |
| Analyst Following | 6.7108 | 5 | 4 | 8 | 4.4626 | 53,448 | Company-Quarter |
| Normalized standard deviation | 0.0024 | 0.0009 | 0.0004 | 0.0022 | 0.0098 | 65,064 | Company-Quarter |
| Coefficient of variation | 0.1026 | 0.0556 | 0.0294 | 0.1111 | 0.1705 | 54,982 | Company-Quarter |

**Table 3**

**Average Normalized Forecast Errors for Matched Pairs (Pre-FD vs. Post-FD) of Analyst Forecasts**

Normalized forecast error is defined in Panel A as $NFE_{ijt} = |e_{jt} - \hat{e}_{ijt}| / p_{jt}$ where $e_{jt}$ is the EPS for company j for quarter t, $\hat{e}_{ijt}$ is analyst i's latest forecast of EPS for company j for quarter t during a forecast period, and $p_{jt}$ is the latest available stock price preceding the forecast period. For each quarter, forecasts are included if they occur within an early period and a late period. The early forecast period is the two-month period ending the day before a quarter begins. The late forecast period consists of the two month period ending the day before earnings release. The sample includes all analyst-company pairs in the I/B/E/S database that have at least one NFE observation pre-FD and one observation post-FD; it excludes observations where $p_{jt} < \$1$ or $NFE_{ijt} \geq 2$. Variables are defined similarly in Panel B, based on the latest median (consensus) of analyst estimates issued during a given forecast period.

| | Means | | | Medians | | | Pairs |
|---|---|---|---|---|---|---|---|
| | **Pre**[1] | **Post**[1] | **p-value**[2] | **Pre**[1] | **Post**[1] | **p-value**[2] | |
| **Panel A: Individual analyst forecasts** | | | | | | | |
| ***December Quarters*** | | | | | | | |
| *Early forecasts* | 0.0059 | 0.0104 | < 0.0001 | 0.0019 | 0.0030 | < 0.0001 | 4,381 |
| *Late forecasts* | 0.0028 | 0.0057 | < 0.0001 | 0.0010 | 0.0012 | < 0.0001 | 4,108 |
| ***March Quarters*** | | | | | | | |
| *Early Forecasts* | 0.0055 | 0.0103 | < 0.0001 | 0.0020 | 0.0032 | < 0.0001 | 2,201 |
| *Late forecasts* | 0.0023 | 0.0045 | < 0.0001 | 0.0009 | 0.0011 | < 0.0001 | 5,853 |
| ***June Quarters*** | | | | | | | |
| *Early Forecasts* | 0.0044 | 0.0084 | < 0.0001 | 0.0018 | 0.0025 | < 0.0001 | 4,914 |
| *Late forecasts* | 0.0022 | 0.0043 | < 0.0001 | 0.0009 | 0.0011 | < 0.0001 | 4,888 |
| ***September Quarters*** | | | | | | | |
| *Early Forecasts* | 0.0060 | 0.0141 | < 0.0001 | 0.0022 | 0.0035 | < 0.0001 | 4,162 |
| *Late forecasts* | 0.0022 | 0.0059 | < 0.0001 | 0.0009 | 0.0012 | < 0.0001 | 3,568 |
| **Panel B: Consensus forecasts** | | | | | | | |
| ***December Quarters*** | | | | | | | |
| *Early forecasts* | 0.0119 | 0.0162 | < 0.0001 | 0.0038 | 0.0047 | < 0.0001 | 3,382 |
| *Late forecasts* | 0.0087 | 0.0161 | < 0.0001 | 0.0023 | 0.0028 | < 0.0001 | 3,699 |
| ***March Quarters*** | | | | | | | |
| *Early Forecasts* | 0.0075 | 0.0162 | < 0.0001 | 0.0035 | 0.0050 | < 0.0001 | 2,684 |
| *Late forecasts* | 0.0046 | 0.0121 | < 0.0001 | 0.0020 | 0.0025 | < 0.0001 | 3,175 |
| ***June Quarters*** | | | | | | | |
| *Early Forecasts* | 0.0068 | 0.0163 | < 0.0001 | 0.0033 | 0.0043 | < 0.0001 | 2,982 |
| *Late forecasts* | 0.0046 | 0.0131 | < 0.0001 | 0.0019 | 0.0025 | < 0.0001 | 3,306 |
| ***September Quarters*** | | | | | | | |
| *Early Forecasts* | 0.0078 | 0.0202 | < 0.0001 | 0.0037 | 0.0049 | < 0.0001 | 2,977 |
| *Late forecasts* | 0.0048 | 0.0131 | < 0.0001 | 0.0018 | 0.0023 | < 0.0001 | 2,797 |

[1]For early forecasts, the pre-FD period consists of quarters ending between March 1995 to December 2000, and the post-FD period consists of quarters ending between March 2001 and June 2004. For late forecasts, the pre-FD period consists of quarters ending between March 1995 and June 2000, and the post-FD period consists of quarters ending between December 2000 and June 2004.

[2]P-values are based upon 2-tailed matched-pairs tests (t-tests for means, Wilcoxon signed ranks test for medians).

**Table 4**

**Fixed-Effects Panel Regressions of Normalized Forecast Errors (NFEs) from Early and Late Forecasts**

Panel A shows coefficient estimates from the following cross-sectional time-series regression of individual analyst forecasts:

$$NFE_{ijt} = b_1 REGFD_t + b_2 LAGE_{ijt} + b_3 LOSS_{jt} + b_4 DECLINE_{jt} + b_5 SHOCK_{jt} + u_{ijt},$$

where the variables are as defined in Table 2 and analyst-company-quarter effects are treated as fixed. Early and late forecast periods are as defined in Table 3. The sample period is from January 1995 to June 2004; the quarter ending September 2000 is excluded for the late forecast period. The sample also excludes observations where $p_{jt} < \$1$ or $NFE_{ijt} \geq 2$. Reported t-statistics are from a robust estimator and $R^2$ values are based on overall variation within and across analyst-company pairs. Panel B shows results from corresponding regressions for the consensus (median) of analyst forecasts, where company-quarter effects are treated as fixed.

| | **A. Individual Analyst Forecasts** | | **B. Consensus Forecasts** | |
|---|---|---|---|---|
| **Explanatory Variable** | Early Forecasts | Late Forecasts | Early Forecasts | Late Forecasts |
| REGFD | 0.0023 | 0.0013 | 0.0023 | 0.0022 |
| | (4.85[a]) | (4.20[a]) | (6.29[a]) | (6.70[a]) |
| LAGE | 0.0092 | 0.0006 | 0.0350 | 0.0011 |
| | (5.91[a]) | (4.11[a]) | (8.25[a]) | (4.70[a]) |
| LOSS | 0.0164 | 0.0084 | 0.0282 | 0.0223 |
| | (14.31[a]) | (9.55[a]) | (27.88[a]) | (22.60[a]) |
| DECLINE | 0.0014 | 0.0002 | 0.0031 | 0.0022 |
| | (3.57[a]) | (0.79) | (10.30[a]) | (7.29[a]) |
| SHOCK | 0.0962 | 0.0906 | 0.0745 | 0.1581 |
| | (1.34) | (2.58[a]) | (2.36) | (3.90[a]) |
| Overall $R^2$ | 0.1377 | 0.0903 | 0.1406 | 0.1190 |
| Sample size | 179,729 | 203,808 | 80,512 | 86,568 |
| Median Age of Forecasts (Days) | 150 | 28 | 131 | 14 |
| P-value for difference[1] | 0.0000 | | 0.1161 | |

[1]Test for difference in the coefficient of REGFD between early and late forecasts.

[a]Denotes statistical significance at the 1% level in two-tailed tests.

**Table 5**
**Fixed Effects Panel Regressions of Normalized Forecast Errors:**
**Differential Effects based on Firm Size, Industry, and Post-FD Time Period**

Part I of Panel A of the table shows estimated coefficients $\hat{b}_{1,k}$ (k = S, L) from the following cross-sectional time-series regression:

$$NFE_{ijt} = b_{1,S} REGFD_t * SMALL_j + b_{1,L} REGFD_t * LARGE_j + b_2 LAGE_{ijt} + b_3 LOSS_{jt} + b_4 DECLINE_{jt} + b_5 SHOCK_{jt} + u_{ijt},$$

where $SMALL_j$ equals 1 if the market capitalization of company j is below the sample median for the relevant forecast period in the middle year of the sample period; it equals 0 otherwise. $LARGE_j = 1 - SMALL_j$. The remaining variables are as defined in Table 3, and analyst-company-quarter effects are treated as fixed. Early and late forecast periods are as defined in Table 3. The sample period is from January 1995 through June 2004; the September 2000 quarter is excluded for the late forecast period. The sample also excludes observations where $p_{jt} < \$1$ or $NFE_{ijt} \geq 2$. Part I of Panel B shows results from corresponding regressions for the consensus (median) of analyst forecasts, where company-quarter effects are treated as fixed. Part II shows estimates from regressions similar to those in Part I with SMALL and LARGE replaced, respectively, by GMLIND and GLLIND. GMLIND is an indicator variable equal to 1 for industries where guidance was more likely pre-FD (I/B/E/S SIG codes 04 and 08). GLLIND = 1 – GMLIND. Part III shows estimates from regressions similar to those in Part I with SMALL and LARGE replaced, respectively, by FIRST and LATER. FIRST equals 1 for quarters in the first post-FD year (i.e., the first four post-FD quarters for a given forecast period); it equals zero otherwise. LATER equals 1 for the subsequent post-FD quarters; it equals zero otherwise. P-values are for tests of differences in the coefficient of REGFD between the two groups.

| | A. Individual Analyst Forecasts | | | | B. Consensus Forecasts | | | |
|---|---|---|---|---|---|---|---|---|
| | $\hat{b}_{1,k}$ | t($\hat{b}_{1,k}$) | $R^2$ | N | $\hat{b}_{1,k}$ | t($\hat{b}_{1,k}$) | $R^2$ | N |
| **I. Company Size** | | | | | | | | |
| ***Early Forecasts*** | | | | | | | | |
| *Small Firms* | 0.0029 | 2.51[b] | | | 0.0032 | 4.06[a] | | |
| *Large Firms* | 0.0018 | 3.69[a] | 0.1780 | 161,527 | 0.0004 | 1.01 | 0.2257 | 69,854 |
| *p-value for difference* | 0.4182 | | | | 0.0007 | | | |
| ***Late Forecasts*** | | | | | | | | |
| *Small Firms* | 0.0013 | 2.08[b] | | | 0.0045 | 6.54[a] | | |
| *Large Firms* | 0.0014 | 4.10[a] | 0.0871 | 185,253 | 0.0007 | 2.45[b] | 0.1578 | 74,131 |
| *p-value for difference* | 0.8228 | | | | 0.0000 | | | |
| **II. Industry** | | | | | | | | |
| ***Early Forecasts*** | | | | | | | | |
| *'Guidance More Likely' Industries* | 0.0005 | 0.65 | | | 0.0009 | 1.51 | | |
| *'Guidance Less Likely' Industries* | 0.0045 | 4.99[a] | 0.1374 | 178,943 | 0.0029 | 6.63[a] | 0.1408 | 80,511 |
| *p-value for difference* | 0.0184 | | | | 0.0113 | | | |
| ***Late Forecasts*** | | | | | | | | |
| *'Guidance More Likely' Industries* | 0.0008 | 1.65 | | | 0.0022 | 3.50[a] | | |
| *'Guidance Less Likely' Industries* | 0.0015 | 3.67[a] | 0.0897 | 202,446 | 0.0023 | 5.81[a] | 0.1179 | 86,564 |
| *p-value for difference* | 0.2972 | | | | 0.8771 | | | |
| **III. Post-FD Time Period** | | | | | | | | |
| ***Early Forecasts*** | | | | | | | | |
| *First Post-FD Year* | 0.0013 | 2.25[b] | | | 0.0025 | 4.53[a] | | |
| *Subsequent Post-FD Years* | 0.0031 | 6.01[a] | 0.1362 | 179,729 | 0.0022 | 5.59[a] | 0.1407 | 80,512 |
| *p-value for difference* | 0.0015 | | | | 0.6316 | | | |
| ***Late Forecasts*** | | | | | | | | |
| *First Post-FD Year* | 0.0005 | 1.47 | | | 0.0040 | 6.70[a] | | |
| *Subsequent Post-FD Years* | 0.0020 | 5.09[a] | 0.0903 | 203,808 | 0.0016 | 4.53[a] | 0.1190 | 86,568 |
| *p-value for difference* | 0.0000 | | | | 0.0001 | | | |

[a,b] Denote statistical significance at the 1% and 5% levels, respectively, in two-tailed tests.

**Table 6**

**Average Dispersion of Analyst Forecasts for Matched Pairs of Companies (Pre-FD vs. Post-FD)**

The table shows mean and median values for the coefficient of variation (COV) in analyst forecasts. Statistics are reported for early and late forecast periods (defined in Table 3) for quarters ending in March, June, September, and December. For company j during forecast period t, $COV_{jt} = \sigma_{jt} / \left|\overline{X}_{jt}\right|$, where $\sigma_{jt}$ is the standard deviation of analysts' forecasts and $\overline{X}_{jt}$ is the mean of forecasts. Within each forecast period, only analysts' latest EPS estimates are included. The sample includes all companies in the I/B/E/S database that have at least one COV observation each pre- and post-FD. Observations are excluded if there are fewer than three analysts following a company or if $\overline{X}_{jt} < \$0.10$.

| | Mean | | | Median | | | Sample Size |
|---|---|---|---|---|---|---|---|
| | Pre[1] | Post[1] | p-value[2] | Pre[1] | Post[1] | p-value[2] | |
| **December** | | | | | | | |
| Early forecasts | 0.0993 | 0.1297 | 0.0000 | 0.0609 | 0.0769 | 0.0000 | 1,715 |
| Late forecasts | 0.0962 | 0.0966 | 0.9179 | 0.0540 | 0.0588 | 0.3079 | 1,919 |
| | | | | | | | |
| **March** | | | | | | | |
| Early forecasts | 0.0934 | 0.1164 | 0.0000 | 0.0594 | 0.0725 | 0.0000 | 1,113 |
| Late forecasts | 0.0892 | 0.0948 | 0.0931 | 0.0556 | 0.0591 | 0.0101 | 1,661 |
| | | | | | | | |
| **June** | | | | | | | |
| Early forecasts | 0.0883 | 0.1220 | 0.0000 | 0.0541 | 0.0714 | 0.0000 | 1,530 |
| Late forecasts | 0.0832 | 0.0945 | 0.0016 | 0.0527 | 0.0566 | 0.0199 | 1,780 |
| | | | | | | | |
| **September** | | | | | | | |
| Early forecasts | 0.0845 | 0.1200 | 0.0000 | 0.0540 | 0.0708 | 0.0000 | 1,528 |
| Late forecasts | 0.0822 | 0.1021 | 0.0000 | 0.0482 | 0.0556 | 0.0000 | 1,479 |

[1] For early forecasts, the pre-FD period consists of quarters ending between March 1995 to December 2000, and the post-FD period consists of quarters ending between March 2001 and June 2004. For late forecasts, the pre-FD period consists of quarters ending between March 1995 and June 2000, and the post-FD period consists of quarters ending between December 2000 and June 2004.

[2]P-values are based upon 2-tailed matched-pairs tests (t-tests for means, and Wilcoxon signed ranks tests for medians).

**Table 7**

**Fixed Effects Panel Regressions of Dispersion in Analysts' Forecasts**

Each column in the table shows coefficient estimates from the following cross-sectional time-series regression for either early or late forecast period (defined in Table 3):

$$DISPERSION_{jt} = b_1 REGFD_t + b_2 LAGE_{jt} + b_3 LOSS_{jt} + b_4 DECLINE_{jt} + b_5 SHOCK_{jt} + u_{ijt}$$

where DISPERSION equals normalized standard deviation (NSD) or coefficient of variation (COV). $LAGE_{jt}$ is the natural log of one plus the number of days between earnings release and the date at which the standard deviation is computed. The variables are as defined in Table 2 and company-quarter effects are treated as fixed. Early and late forecast periods are as defined in Table 3. The sample includes quarters ending between January 1995 and June 2004; the September 2000 quarter is excluded for the late forecast period. Observations are also excluded if there are fewer than three analysts following a company; or if $p_{jt}$ < \$1 (for NSD) or $\overline{X}_{jt}$ < \$0.10 (for COV). Reported t-statistics are from a robust estimator and $R^2$ values are based on overall variation within and across analyst-company pairs.

| Explanatory Variable | **A. Normalized Standard Deviation** | | **B. Coefficient of Variation** | |
|---|---|---|---|---|
| | Early Forecasts | Late Forecasts | Early Forecasts | Late Forecasts |
| REGFD | 0.0011 | 0.0006 | 0.0168 | -0.0024 |
| | (7.17[a]) | (5.53[a]) | (8.40[a]) | (-1.61) |
| LAGE | 0.0018 | -0.0003 | 0.0318 | 0.0037 |
| | (3.06[a]) | (-0.80) | (2.84[a]) | (3.29[a]) |
| LOSS | 0.0045 | 0.0063 | 0.1460 | 0.1530 |
| | (7.60[a]) | (8.02[a]) | (13.89[a]) | (13.54[a]) |
| DECLINE | -0.0005 | -0.0002 | 0.0188 | 0.0370 |
| | (-2.49[b]) | (-0.63) | (9.53[a]) | (21.00[a]) |
| SHOCK | 0.0029 | -0.0006 | -0.0679 | 0.0851 |
| | (0.58) | (-0.31) | (-2.21[b]) | (1.34) |
| Overall $R^2$ | 0.0499 | 0.0229 | 0.1154 | 0.1291 |
| Sample size | 46,285 | 57,063 | 31,834 | 39,464 |
| P-value for difference[1] | 0.5505 | | 0.0000 | |

[1]Test for the difference in the coefficient of REGFD between early and late forecasts.

[a,b] Denote statistical significance at the 1% and 5% levels, respectively, in two-tailed tests.

**Table 8**

**Fixed-Effects Panel Regressions of Forecast Dispersion: Differences Across Firm Size, Industry, and Post-FD Time Period**

Part I of the table shows estimated coefficients $\hat{b}_{1,k}$ (k = S, L) from the following cross-sectional time-series regression for either early or late forecast period (defined in Table 3):

$$DISPERSION_{jt} = b_{1,S} REGFD_t * SMALL_j + b_{1,L} REGFD_t * LARGE_j$$

$$+ b_2 LAGE_{jt} + b_3 LOSS_{jt} + b_4 DECLINE_{jt} + b_5 SHOCK_{jt} + u_{ijt},$$

where DISPERSION equals normalized standard deviation or coefficient of variation, and the variables are as defined in Tables 2, 5 and 7. Company-quarter effects are treated as fixed. The sample includes quarters ending between January 1995 and June 2004; the September 2000 quarter is excluded for the late forecast period. Observations are also excluded if there are fewer than three analysts following a company; or if $p_{jt}$ < \$1 (for NSD) or $\overline{X}_{jt}$ < \$0.10 (for COV). In parts II and III, estimates are shown from regressions similar to those in part I with SMALL and LARGE replaced, respectively, by GMLIND and GLLIND (in part II) and by FIRST and LATER (in part III). The last four variables are as defined in Table 5. P-values are for tests of differences in the coefficient of REGFD between the two groups.

| | A. Normalized Standard Deviation | | | | B. Coefficient of Variation | | | |
|---|---|---|---|---|---|---|---|---|
| | $\hat{b}_{1,k}$ | t($\hat{b}_{1,k}$) | $R^2$ | N | $\hat{b}_{1,k}$ | t($\hat{b}_{1,k}$) | $R^2$ | N |
| **I. Company Size** | | | | | | | | |
| ***Early Forecasts*** | | | | | | | | |
| *Small Firms* | 0.0008 | 4.49[a] | | | 0.0072 | 1.71 | | |
| *Large Firms* | 0.0011 | 5.33[a] | 0.0701 | 41,388 | 0.0195 | 9.19[a] | 0.1245 | 29,005 |
| *p-value for difference* | 0.3885 | | | | 0.0092 | | | |
| ***Late Forecasts*** | | | | | | | | |
| *Small Firms* | 0.0003 | 1.75 | | | -0.0114 | -3.71[a] | | |
| *Large Firms* | 0.0008 | 5.19[a] | 0.0215 | 50,578 | 0.0011 | 0.73 | 0.1394 | 35,465 |
| *p-value for difference* | 0.0348 | | | | 0.0002 | | | |
| **II. Industry** | | | | | | | | |
| ***Early Forecasts*** | | | | | | | | |
| *"Guidance More Likely" Industries* | 0.0009 | 6.16[a] | | | 0.0197 | 4.49[a] | | |
| *"Guidance Less Likely" Industries* | 0.0012 | 4.94[a] | 0.0499 | 46,285 | 0.0158 | 7.17[a] | 0.1150 | 31,834 |
| *p-value for difference* | 0.2862 | | | | 0.4187 | | | |
| ***Late Forecasts*** | | | | | | | | |
| *"Guidance More Likely" Industries* | 0.0003 | 1.72 | | | -0.0037 | -1.06 | | |
| *"Guidance Less Likely" Industries* | 0.0008 | 5.03[a] | 0.0231 | 57,062 | -0.0020 | -1.28 | 0.1293 | 39,464 |
| *p-value for difference* | 0.0170 | | | | 0.6547 | | | |
| **III. Post-FD Time Period** | | | | | | | | |
| ***Early Forecasts*** | | | | | | | | |
| *First Post-FD Year* | 0.0007 | 4.72[a] | | | 0.0126 | 4.48[a] | | |
| *Subsequent Post-FD Years* | 0.0013 | 6.59[a] | 0.0491 | 46,285 | 0.0191 | 9.03[a] | 0.1153 | 31,834 |
| *p-value for difference* | 0.0015 | | | | 0.0191 | | | |
| ***Late Forecasts*** | | | | | | | | |
| *First Post-FD Year* | 0.0003 | 1.77 | | | -0.0014 | -0.59 | | |
| *Subsequent Post-FD Years* | 0.0007 | 5.45[a] | 0.0227 | 57,063 | -0.0028 | -1.80 | 0.1291 | 39,464 |
| *p-value for difference* | 0.0279 | | | | 0.5456 | | | |

[a,b] Denote statistical significance at the 1% and 5% levels, respectively, in two-tailed tests.