

INFORMATION AND SELECTIVE DISCLOSURE

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Abstract. This paper examines whether the prohibition of selective disclosures to equity research analysts mandated by Regulation FD alters the manner in which information is revealed to the market. We use the aggregate behavior of equity research analysts to construct a sample of all material information events. We find that the same amount of firm-specific information is incorporated into stock prices before and after the adoption of Reg FD. More firm-specific information is communicated using public disclosure channels after Reg FD. We find that firms use earnings guidance as a substitute for selective disclosure. Surprisingly, companies do not increase their use of press releases to communicate information other than earnings guidance. We conclude that the passage of Reg FD has successfully encouraged firms to disclose the same amount of information as before while achieving its objective of “levelling the playing field” for all investors.

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ABSTRACT. This paper examines whether the prohibition of selective disclosures to equity research analysts mandated by Regulation FD alters the manner in which information is revealed to the market. We use the aggregate behavior of equity research analysts to construct a sample of all material information events. We find that the same amount of firm-specific information is incorporated into stock prices before and after the adoption of Reg FD. More firm-specific information is communicated using public disclosure channels after Reg FD. We find that firms use earnings guidance as a substitute for selective disclosure. Surprisingly, companies do not increase their use of press releases to communicate information other than earnings guidance. We conclude that the passage of Reg FD has successfully encouraged firms to disclose the same amount of information as before while achieving its objective of “levelling the playing field” for all investors.

1. INTRODUCTION

Ever since *Dirk vs. Pitt* established a legal framework for conducting equity research, stock analysts have been the recipients of selective disclosures of private information from the companies they follow. Historically, companies have been allowed to release material information to analysts without simultaneously making it available to public investors. For example, if management wanted to lower earnings expectations due to a pending announcement of bad news, it could selectively disclose this to analysts who would lower their earnings forecasts. In this manner, companies were able to indirectly release important information without having to publicly disclose its exact nature.¹

Under the leadership of Arthur Levitt, the Securities Exchange Commission (SEC) determined that these selective disclosures were unfair to public investors. The adoption of Regulation Fair Disclosure (Reg FD) in October 2001 was designed to “level the playing field” for all investors by prohibiting selective disclosures to analysts and institutional investors, thereby requiring firms to make public, all disclosures of material information.²

The passage of Reg FD has spawned a debate concerning the quantity and quality of information that will be available to investors in this new environment. Opponents argue that the net effect of eliminating selective disclosure will be wider

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¹Ross (1979) discusses the economics of information disclosure under the traditional view that insiders will never reveal their information, under the incentive-signaling view in which managers do not disclose information when the cost of doing so exceeds the benefits. In this context, the debate on Regulation FD may be cast as a question of whether the rule imposes higher costs to firms for disclosing information and whether it improves the information efficiency.

²In the event that a firm unintentionally discloses material information in private one-on-one communications, it must publicly disclose this information within 24 hours.

dispersion in analysts' earnings estimates, greater stock price volatility, and a reduction in the amount of information disclosed to investors. With respect to this final point, some observers claim that certain firms will be reluctant to disclose information that could prove valuable to their competitors, and will, therefore, discontinue making disclosures, which they otherwise would have released to analysts. Others argue that "firms would find it so difficult to determine when a disclosure of information would be "material" (and therefore subject to the regulation) that, rather than face potential liability and other consequences of violating Reg FD, they would cease informal communications with the outside world altogether."³

The SEC and other proponents of Reg FD argue that selective disclosures create an unfair advantage to their recipients and provide opportunities for analysts and their clients to effectively trade on inside information. Growing concerns about the lack of transparency associated with selective disclosures and criticism about the expanded role of equity research analysts in the investment banking process have motivated the SEC to address this issue.⁴ Given the relative ease with which information can now be transmitted via the internet and the strong incentives that already exist to release information in a timely manner, advocates of Reg FD do not expect to see a reduction in the number of information disclosures.

Based on early survey evidence, the reality likely lies somewhere between these views. Respondents indicate that companies have adopted significantly different approaches to dealing with these new disclosure requirements.⁵ For example, the National Investors Relations Institute conducted a survey of 577 investor relation professionals and found that 28-percent provide more information post-FD and 24-percent provide less. Similar results have been obtained in other surveys.⁶

A number of academic studies have evaluated the impact of Reg FD. While empirical evidence largely confirms that Reg FD has reduced the level of information asymmetry among different market participants and that it has no effect on the volatility of stock returns, its impact on other issues is somewhat ambiguous.⁷

³"Final Rule: Selective Disclosure and Insider Trading," Securities and Exchange Commission, 17 CFR Parts 240, 243, and 249, Release Nos. 33-7881, 34-43154, IC-24599, File No. S7-31-99 RIN 3235-AH82, www.sec.gov/rules/final/33-7881.htm

⁴Laura Unger noted that it is common for equity research analysts to own stock in the companies they recommend. The SEC found that 16 of 57 analysts reviewed had made pre-IPO investments in a company they later covered. "Written Testimony Concerning Conflicts of Interest Faced by Brokerage Firms and Their Research Analysts," Laura S. Unger, Acting Chair, U.S. Securities & Exchange Commission, Before the Subcommittee on Capital Markets, Insurance, and Government Sponsored Enterprises, Committee on Financial Services, United States House of Representatives, July 31, 2001, www.sec.gov/news/testimony/073101tslu.htm

⁵Special Study: Regulation Fair Disclosure Revisited, Commissioner Laura S. Unger, December 2001, www.sec.gov/news/studies/regfdstudy.htm

⁶The Association for Investment Management and Research surveyed 423 of its members and found that 57 percent of the respondents believe that the amount of information released by public companies has decreased compared to 14-percent that believe it has increased. Since this survey polls investment analysts and portfolio managers, it represents the view of a group that has been accustomed to receiving selective disclosures and is most affected by the changes in the disclosure environment. The American Bar Association conducted a survey of 62 members of the securities bar and found that 45-percent said that their clients provide more information post-FD and 26-percent make fewer disclosures.

⁷Sunder (2003) compares firms that restrict analyst participation in conference calls to those that had open access prior to the adoption of Reg FD. He finds that asymmetric information is higher for firms that restrict participation and that this difference is eliminated after Reg FD is adopted. Zitzewitz (2002) examines analyst forecast revisions and finds that analysts have

A prediction made by opponents of Reg FD is that there will be greater dispersion in earnings forecasts. Irani (2004) finds that analyst forecast accuracy, when guided by conference calls and issue guidance, improves after Reg FD, implying that dispersion declines. Of course, Irani (2004) only considers a subset of firms that actively attempt to improve the information available to analysts so the result, although reassuring, is not particularly surprising. By contrast, Mohanram and Sunder (2002) and Bailey, Li, Mao, and Zhong (2003) find higher dispersion in analyst forecasts and other measures of disagreement around earnings announcements.

Perhaps the most important and unresolved prediction of those opposed to Reg FD is that the amount of information disclosed by firms will decrease. Bushee, Matsumoto, and Miller (2002) find that the amount of information disclosed during conference calls does not change after Reg FD. Eleswarapu, Thompson, and Venkataraman (2002) analyze market model residuals and show that the information flow around mandatory earnings announcement declines but that the overall information (mandatory earnings plus voluntary earnings guidance) does not appear to change after Reg FD.

There is some evidence that firms adjust their disclosure policies by increasing the number of voluntary disclosures. With respect to the frequency of information disclosure, Bailey, Li, Mao, and, Zhong (2003), Heflin, Subrahmanyman, and Zhang (2003), Mac (2003), and Feldman, Lazer, and Livnat (2003) report an increase in the amount of company issued earnings guidance and the number of firms issuing guidance.

Our paper contributes to this literature by addressing the following questions. First, has the overall amount of firm-specific information reflected in stock prices changed?⁸ Second, in the absence of selective disclosure, is more information released to investors via public disclosure? Third, how do firms choose to publicly disclose information?⁹ Although Reg FD is silent on this issue, firms use various mechanisms to disclose information such as earnings announcements, company issued guidance, press releases, letters to share holders, and mandatory filings. When selective disclosures are prohibited, do firms stop providing this information or do they simply find alternatives? Lastly, has the amount of information per disclosure “channel” changed in the post-FD period?

less private information post FD. A number of studies that examine market microstructure data find that information asymmetry between informed and uninformed investors declined after Reg FD (Eleswarapu, Thompson, and Venkataraman, 2002; Straser, 2002). On the volatility issue, Heflin, Subrahmanyman, and Zhang (2003) and Gadarowski and Sinha (2002) report that return volatility declined following Reg FD. Bailey, Li, Mao, and, Zhong (2003) attribute this to the decimalization of quote size rather than Reg FD. Regardless, there is no evidence that the passage of Reg FD has resulted in higher volatility levels.

⁸We measure firm specific information using residuals from the market model and from the Fama and French three factor model. We also take into account the fact that the intrinsic information flow may differ during different calendar years by comparing information during the fiscal years immediately preceding and following the adoption Reg FD.

⁹There are a number of exclusions to the reporting requirements of Reg FD. For example, credit rating agencies continue to have access to non-public information after Reg FD. Jorion, Liu, and Shi (2004) examine the informativeness of disclosures by credit rating agencies in the post-FD environment and find that the information content is higher and conclude that Reg FD has conferred a strategic environment to rating agencies.

This paper examines these questions by considering how the elimination of selective disclosure alters the aggregate information *transmission process*. Existing studies tend to focus on one aspect of the disclosure process such as the use of earnings guidance or the number of voluntary disclosures. Since the information used to price securities is obtained from many sources, it is inappropriate to draw conclusions about the effects of Reg FD without considering how firms adjust their disclosure policies in the aggregate. It is not sufficient to note that certain types of disclosures increase in frequency. The larger question is whether firms provide the same amount of information as before but use different disclosure mechanisms.

Identifying all relevant information from all of the available sources is a daunting, but not impossible, task. To do this, we propose a new methodology for identifying information events that is based on the aggregate behavior of equity research analysts. Equity research analysts collect and interpret information releases from a variety of sources. A major part of their job is to determine when the information set has changed enough to warrant revising the earnings forecasts and stock recommendations of the firms they cover. In essence, analysts function like “information capacitors” that discharge once a critical amount of information is accumulated.

When viewed in the aggregate, the number of analysts that revise their earnings forecasts indicates the importance of a particular piece of information. When analysts “cluster” together, it indicates that there has been a significant change in the information set. Identifying information events this way has the advantage of letting analysts determine when new information has arrived and eliminates the need for the researcher to make subjective evaluations of the importance of different events.

We use the “analyst cluster” sample to compile a “complete” record of all “material” information events. To estimate the effect of Reg FD on firm disclosure policies, we partition information events into two groups: public disclosures of firm specific information and “other” events. We further classify the “public disclosures” into three groups: quarterly earnings announcements, company issued earnings guidance, and company issued press releases. Those events classified as “other” are simply the set of analyst clusters that are not associated with a public disclosure identified above.

Using our analyst cluster sample, we analyze the questions posed above. Our empirical findings indicate the following. First, the aggregate amount of information reflected in stock prices is unaffected by the adoption of Reg FD (there is a statistically insignificant decrease). Second, firms adjust their disclosure policies by relying more on public disclosures. Third, firms disclose more information through company issued earnings guidelines and press releases. Fourth, with the exception of earnings guidance, companies do not rely more on other types of press releases. This is surprising because it would be easy to provide the same information that was previously disclosed to analysts on a selective basis through press releases.

We conclude that management uses earnings guidance as a substitute for selective disclosure. This is likely due to a desire to have reasonably accurate earnings forecasts but a reluctance to fully disclose all of the underlying information. However, there are several studies (Baginski, Hassle, and Kimbrough (19XX) and Hutton, Miller, and Skinner (19XX)) that show forecasts are often bundled with lots of explanatory information. In fact, the forecast may be provided to explain a situation more fully, rather than to hide it. Finally, we find that there is no change

in the amount of information per information disclosure. Firms simply disclose information directly to public investors more often. Taken together, this suggests that the passage of Reg FD has indeed achieved its objective of making information simultaneously available to all investors without diminishing the aggregate amount of information reflected in stock prices.

2. INFORMATION REVELATION AND TESTABLE IMPLICATIONS

The information used by investors to price securities is obtained from a variety of sources. Sometimes it originates at the firm level, other times in the broader “market.” From the perspective of an individual investor, it is virtually impossible to collect the complete time series of information events that affect security prices and assess their relative importance. Not only is some information unobservable (e.g. private communications to a select group of equity research analysts), but even if investors had access to all of the important disclosures for a particular company, additional information is frequently gleaned from similar disclosures by related firms.¹⁰

Keeping track of these different information sources is equally challenging for academic researchers attempting to understand how information affects security prices. Rather than attempt to identify all of these events ourselves, we adopt an approach that relies upon the aggregate behavior of equity research analysts. We believe that this approach is the best way to identify important information because the primary function of research analysts is to obtain and interpret information, regardless of its source. Analysts notify investors of material changes in the information set by revising earnings forecasts. When viewed collectively, the number of analysts that make revisions indicates the importance of a particular piece of information.

We identify an important information event as one that causes analysts to revise their earnings forecasts in a relatively short period of time, and define such an occurrence as an “analyst cluster.”¹¹ Specifically, an analyst cluster is formed when more than 10-percent of the analysts that follow a particular company revise their earnings forecasts within the same two-day window. We also require that an analyst cluster contain a minimum of three forecast revisions.¹² If a particular piece of information is difficult to interpret or multiple pieces of information are released within a short period of time, it is possible for a number of analyst clusters to overlap. When this occurs, we treat the overlapping clusters as a single event.

Identifying information events this way has the advantage of letting analysts determine what is important and eliminates the need for the researcher to make subjective evaluations of the importance of different events. The main drawback is that it only identifies events that affect current earnings. Figure 1 illustrates how analyst clusters form after analysts observe different disclosure events. Notice that there are a number of information events that were sufficient to cause at least one

¹⁰Suppose a competitor firm issues a press release to announce that it has discovered a technological breakthrough that will significantly lower its production costs. This is, of course, good news for the competitor, but will likely cause analysts to lower the earnings forecasts of the firm being evaluated.

¹¹Mozez and Williams (1999) look at the stock price reactions surrounding analyst clusters.

¹²Bagnoli, Levine, and Watts (2004) examine analyst clusters using a three analyst criteria regardless of the number of analysts that follow a company. Since relatively few firms have at least forty analysts, both identification criteria are very similar.

of the analysts to revise. Of these, only two generated enough revision activity to be classified as an analyst cluster (C1 and C2).

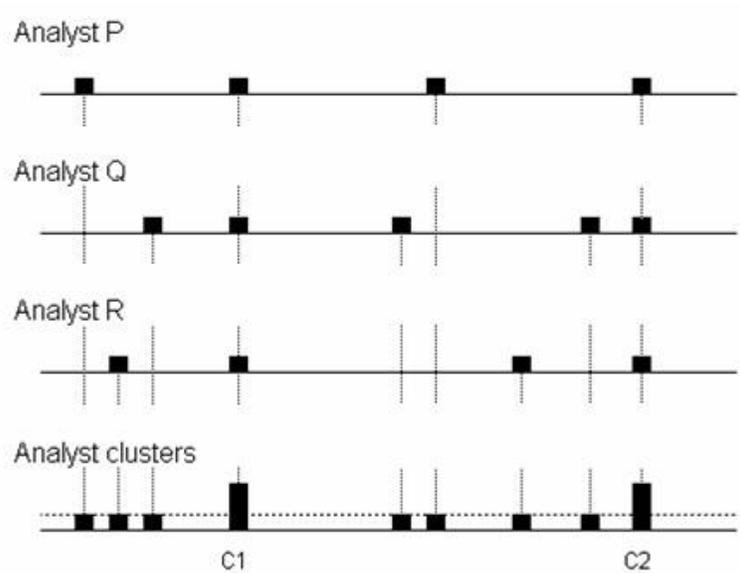


FIGURE 1. Analyst Cluster Formation. This figure illustrates how forecast revisions by individual analysts are aggregated to identify analyst clusters (C1 and C2).

2.1. Classification of information events by disclosure channel. The basic idea is to identify important information events by estimating all of the analyst clusters for each firm in our sample. We then classify each cluster on the basis of how it was disclosed to investors. To determine the disclosure source of an analyst cluster, we separate information events into two groups: company-specific disclosures and “other” disclosures.

The items we consider to be company-specific disclosures include press releases, company issued earnings guidance, the filing of financial statements, and other mandatory filings designed to comply with securities regulations. The information events that are included in the “other” events category simply reflect the set of analyst clusters that are not associated with a company-specific disclosure.

The benefits of identifying and classifying all information events that are important to analysts are twofold. First, we can estimate how company disclosure policies change following Reg FD. Second, we can evaluate how often certain information events are associated with earnings clusters and whether their relative importance is affected by the passage of Reg FD. We can also measure whether Reg FD affects how information is interpreted by investors and whether the type of disclosure channel matters.

2.1.1. Company-specific disclosures. Management makes a number of direct disclosures to investors. These include press releases, company issued earnings guidance, stories that appear in the financial press based on interviews with news reporters,

and the filing of financial statements and other mandatory disclosures designed to comply with securities regulations.

We are interested in evaluating the quality and quantity of different types of direct public disclosures. We identify three public release subsamples: news reports based on company-issued press releases, company issued earnings guidance, and earnings report dates.

The “Press Release” subsample is obtained by selecting articles based on information contained in company-issued press releases using procedures described more fully in Section 3. We read each article to determine whether the disclosure is likely to affect share price. The “Earnings Guidance” subsample represents the instances where companies issue earnings guidance directly to investors. Unlike the selective disclosures a company makes to analysts, earnings guidance is a public disclosure of management’s internal forecast of the level or possible range of future earnings.

These two subsamples are of particular interest. Prior to the passage of Reg FD, companies could selectively inform analysts about pending events as well as make private suggestions when management believed that analysts’ earnings forecasts were in error. Since these disclosures are now prohibited, we expect companies to increase their reliance on public communication channels such as press releases to provide more earnings guidance. In essence, when one communications channel is blocked, we expect firms find other ways to release valuable information.

The final subset of public disclosures are earnings report dates. We include these dates because significant information is revealed directly to investors on these dates and there tends to be significant revision activity when analysts are surprised by reported earnings.

2.1.2. Other information events. The second general class of information events is simply the set of analyst clusters that are not associated with a public disclosure identified above. This includes three types of events: selective disclosures to a group of analysts (presumably a pre-Reg FD event), company-specific disclosures (public and selective) of related companies, and “market” information. We lump them together because the event date is either infeasible to collect (public disclosures of related companies and market information) or, by definition, the events are unobservable (selective disclosures).

2.2. Testable Hypotheses. The testable hypotheses we examine consider whether the elimination of selective disclosure changes: 1) the distribution of event types, 2) analyst behavior, and 3) the amount of information contained in a typical information event.

The following two hypotheses state our main predictions regarding the effect of Regulation FD on the distribution of information events and the behavior of analysts.

Hypothesis 1. If Reg FD encourages firms to provide the same level of information as before its passage, we expect the following

- (1) The level of firm specific information should remain the same before and after Reg FD.
- (2) More firm specific information is disclosed through public channels. This may manifest itself as an increase in the number of clusters associated with public disclosures and a decrease in the number of analyst clusters

related to “other” information events and/or an increase in the amount of information disclosed per event related to public analyst clusters.

- (3) Companies will issue more earnings guidance and/or press releases because private communication channels are closed after Reg FD.
- (4) More analysts revise earnings forecasts after the company issues earnings guidance because companies are required to make public corrections once private communication channels are closed after Reg FD.

Alternatively, if Reg FD has the unintended but possible effect of causing firms to stop disclosing information that they previously disseminated through selective disclosures, there should be less firm specific information and no change in the level of firm specific information disclosed through public channels.

Our second hypothesis reflects the observation that, since more information is disclosed through public channels following the passage of Regulation FD, more firm-specific information is delivered directly to investors.

Hypothesis 2. Public information events should be more informative. This implies that, for a given public disclosure event (company issued earnings guidance and press releases), the level of firm-specific information is higher following the passage of Regulation FD.

3. SAMPLE SELECTION

To analyze these predictions, we select the 100 firms that have the highest number of earnings revisions in the First Call database during the fiscal year immediately preceding the passage of Regulation FD that have data in the Center for Research in Security Prices (CRSP).

We focus on firms with the most revision activity for two reasons. First, since the most active firms are those that have rapidly changing information sets, it increases the power of our tests. If one wants to test whether Reg FD has changed the information disclosure environment it makes sense to focus on a set of firms that are the most directly affected by its passage. The second reason is practical. The process of hand-collecting and classifying all of the press releases is labor intensive and time consuming.

Table 1 provides summary statistics. Our sample of firms that have the most forecast revision activity is distributed across 27 different industries based on two-digit SIC code. Although a large number of industries are represented, 22% of the sample are manufacturing companies (SIC 35). The firms that attract the most analyst attention tend to be large (\$15.94 billion) with high levels of trading activity (1,046.76 million shares per month).

Not surprisingly, given the sample selection criterion, these firms attract significant analyst attention. Table 2 indicates that the average firm has 24 analysts that provide earnings coverage. In the fiscal year immediately prior to the adoption of Reg FD, these analysts revised their forecasts 116.35 times per firm, which is 5.16 revisions per analyst. In the first complete fiscal year after Reg FD, analysts increased the average number of revisions to 141.96. The typical analyst made 0.70 (5.86-5.16) more revisions per firm after Reg FD was adopted.

3.1. Identification of information release dates. Information release dates are obtained from the First Call database and the Dow Jones Newswire. We use First

Call to identify quarterly and annual earnings report dates and Company Issued Guideline (CIG) dates. CIGs are company announcement that provide information to equity research analysts about upcoming earnings reports, the level of the consensus earnings (or sales) forecast relative to management’s forecast. For example, the company may be quite specific and indicate that they expect earnings to be “at or below” a specific amount. Alternatively, management may be rather vague and simply note that they are “not comfortable with” the consensus forecast. The intent of a CIG is to change analysts’ interpretation of existing information rather than to provide new information. Table 3 indicates that there are 477 CIG dates in our sample. After the adoption of Reg FD, the number of times companies provide earnings guidance increases 178.6% (126 to 351).

We identify information release dates by searching for company news on the Dow Jones News Wire. The key words we use are the company’s name or ticker and the phrase “press release.” We then read each article that satisfies this criterion. Any articles that relate to the views of investment news letters or were not released directly by the company itself are discarded.

We search for the following type of news reports: 1) earnings related, 2) mergers and acquisitions, 3) significant sales and acquisitions of assets relative to the capitalization of the firm, 4) changes in dividend policy, 5) actual, pending or possible changes in debt ratings, 6) developments related to actual, pending, and potential major lawsuits, 7) capital structure changes, e.g., security issues, buybacks, and recapitalizations, 8) retail store sales levels, 9) any other news event that is deemed important, e.g., a new product announcement. We recognize that our efforts to collect this data are subjective, but we believe that it is unlikely that we miss a material event.

Table 3 shows that companies use press releases to communicate material information more often than they use them to provide earnings guidance. The sample contains 1,412 such events of which 700 (712) are released in the fiscal years immediately preceding (following) the adoption of Reg FD. Unlike our finding that firms increase their reliance on earnings guidance, it does not appear that Reg FD affects the frequency that firms issue press releases.

Table 3 indicates that there is a 40.2% increase in the number of analyst clusters in the post-FD period (6,630 to 9,326). This suggests that material information is more frequently available to investors after the adoption of Reg FD. This finding could be attributable to a number of factors. For example, it could reflect adjustments to company disclosure policies in response to Reg FD, or it could reflect a period when information was changing rapidly. Panel B reports the estimates on a per firm basis. These results are qualitatively similar to those presented in Panel A.

4. EMPIRICAL EVIDENCE

4.1. Information channels and analyst behavior. Next, we consider whether the distribution of information events changes following Regulation FD. Since Regulation FD is designed to eliminate selective disclosures to analysts, Hypothesis 1 suggests that companies rely more on public disclosure once private communications are prohibited. We also expect more analysts to respond to public signals following Regulation FD.

Table 4 reports statistics that characterize the number of forecast revisions per analyst cluster across event types. Panel A indicates that companies provide more earnings guidance after selective disclosure is prohibited. In essence, Regulation FD requires companies to use public communication channels to correct analysts who make incorrect inferences. The number of companies providing earnings guidance increase 84.6% (39 to 72 firms).

Panel A also demonstrates that the average number of analyst clusters associated with a public information disclosure increases after Regulation FD. By contrast, the number of analysts per cluster in the “other” events category remains stable. This suggests that firms adjust their disclosure policies after Reg FD by disclosing a higher fraction of firm-specific information using public disclosures.

Panel B presents the empirical distribution of analyst clusters that are associated with public disclosures. In the pre-FD period, 47.25% of all analyst clusters are associated with earnings report dates, 12.67% with company-issued earnings guidance, and 22.74% with press releases. The remaining 17.34% of analyst clusters are classified as “other” events. This category includes selective disclosures.

The distribution changes significantly in the post-FD period. The number of analyst clusters associated with earnings reports drops to 40.84%. Analyst clusters associated with earnings guidance (31.21%) and press releases (26.15%) have significant increases. The fraction of analyst clusters associated with “other” events drops from 17.35% to 1.80%.

This large drop suggests that companies adjust their disclosures policies in a manner encouraged by the SEC. Since the “other” category includes selective disclosure, a back of the envelope calculation suggests that 15.54% (17.34%-1.80%) of all analyst clusters in the pre-FD were associated with selective disclosures.

Panel C reports the frequency with which a public information event produces an analyst cluster. Earnings report dates are associated with analyst clusters more than 70% of the time, and there is no noticeable change after Reg FD. By contrast, analysts are much more likely to respond to earnings guidance (67.43% to 90.12%) and company-issued press releases (27.55% to 42.75%). This is consistent with the hypothesis that analysts are more responsive to public disclosures because they obtain more of their information from these sources after selective disclosures are prohibited.

4.2. Changes in information content. This section uses return-based measures of firm-specific information to estimate the aggregate amount of firm-specific information communicated to investors. We also perform a multivariate analysis of the firm-specific information contained in excess stock returns. Both analyses estimate abnormal returns using the market model and a Fama-French three-factor model. All of our results support the hypothesis that public information events communicate the same firm-specific information following the passage of Regulation FD.

4.2.1. Univariate tests of firm-specific information. Table 5 reports two related measures of firm-specific information. The first is the variance of the daily abnormal returns. The second is the absolute value of the cumulative abnormal returns over days inside and outside analyst clusters. We estimate firm-specific information over

an analyst cluster as:

$$(1) \quad FSI_i = \left| \sum_{t=1}^{D_i} AR_{it} \right|.$$

where D_i is the number of days in an analyst cluster and AR_{it} is the abnormal return on day t . We then aggregate across all analyst clusters, i.e.,

$$(2) \quad AFSI = \sum_{i=1}^I FSI_i.$$

where I denotes the number of analyst clusters.

We make a corresponding estimate for non-cluster days. We begin by creating an artificial set of “clusters” using the time-series of non-cluster days. For example, to construct a sample of n -day clusters, we calculate the absolute value of the n -day cumulative abnormal returns for each contiguous, non-overlapping set of n -day abnormal returns, i.e.,

$$(3) \quad FSI_n^{non} = \sum_{t=1}^{T/n-I} \left| \sum_{j=1}^n AR_{nt-j+1} \right|$$

where T represents the number of trading days in the fiscal year under consideration ($T=252$). If the modulus of $T/n - I$ is greater than zero, we add the absolute value of the unmatched final days’ abnormal returns to this total. This approach controls for possible serial correlation in the abnormal returns. We calculate the aggregate amount of firm-specific information on non-cluster days as

$$(4) \quad AFSI^{non} = \sum_{n=2}^C \omega_n FSI_{non_n}$$

where C represents the maximum number of days in a cluster in the sample and ω_n denotes the fraction of clusters that have a duration of n -days.

We estimate excess returns from the market and the three-factor Fama-French models. Both models are estimated using daily excess returns over an estimation period beginning 01/01/1998 and ending 12/31/1998.¹³ The market model regression is estimated as

$$(5) \quad r_{jt} = \hat{\alpha}_j + \hat{\beta}_j r_{mt} + e_{jt}.$$

where r_{jt} is the daily excess return for firm j on day t . The excess return is calculated as the difference between the daily returns from the Center for Research in Security Prices (CRSP) and the one-month U.S. Treasury bill rate from Ibbotson Associates. r_{mt} is the value-weighted stock market return for the NYSE/AMEX/Nasdaq from CRSP. The abnormal return is then calculated as

$$(6) \quad AR_{jt} = r_{jt} - \hat{\alpha}_j - \hat{\beta}_j r_{mt}.$$

For the Fama-French three-factor model, we estimate the following factor regression

$$(7) \quad r_{jt} = \hat{\alpha}_j + \hat{\beta}_j r_{mt} + \hat{\beta}_{smb,j} smb_t + \hat{\beta}_{hml,j} hml_t + e_{jt}.$$

¹³One firm only has information for 1999 so we use information from 01/01/1999 to 12/31/1999.

where smb_t is the small minus big size factor and hml_t is the high minus low book-to-market factor.¹⁴ Abnormal returns are calculated as

$$(8) \quad AR_{jt} = r_{jt} - \hat{\alpha}_j - \hat{\beta}_j r_{mt} - \hat{\beta}_{smb,j} smb_t - \hat{\beta}_{hml,j} hml_t.$$

Panel A of Table 5 shows that there is a slight decrease in the variance of the daily abnormal returns based on market model estimates. The ratio of the daily variance of the abnormal returns in the pre- and post-FD periods is distributed $F_{100,100}$. This test statistic indicates that the change is insignificantly different from zero.

The second column in Panel A reports the sum of $AFSI$ and $AFSI^{non}$ as another proxy for the aggregate amount of firm-specific information. The decrease in this estimate of -0.340 (t-stat of -1.980) indicates that the aggregate amount of firm-specific information declines in the post-FD period. The aggregate amount of firm-specific information released on days associated with analyst clusters increases significantly, while the information released on non-cluster days decreases. Panel B demonstrates the same qualitative result for the Fama-French three-factor model.

Panel A of Table 6 reports the aggregate amount of firm-specific information across different information events based on market model abnormal returns. We find that a significantly higher fraction of firm-specific information is being communicated via company-supplied earnings guidance and press releases. The increase in firm-specific information transmitted via earnings guidance and press releases is significant at the 5% and 10% levels, respectively. This finding suggests that the elimination of selective disclosures has made public information channels more important in the post Regulation FD period. Panel B demonstrates the same qualitative result for the Fama-French three-factor model.

Since earnings guidance may be communicated through a press release, there is some overlap between the two type of events in our sample. If we only examine press releases that are not associated with an earnings guidance event, we find that the amount of information decreases but it is not statistically significant. This suggests that firms do not communicate as much information to the public as they previously communicated to analysts on a selective basis. Managers may prefer to release a summary of the impact of the news on earnings estimates instead. This is likely due to a desire to have reasonably accurate earnings forecasts but a reluctance to fully disclose all of the underlying information that may be useful to their competitors. As noted before, forecasts are often bundled with lots of explanatory information in order to more fully explain a situation.

Panel A of Table 7 reports the average amount of firm-specific information revealed per analyst cluster across different information events based on market model abnormal returns. This test allows us to distinguish whether the increase (decline) in the amount of information firms disclose through different information channels is the result of more (less) informative or more (less) frequent disclosures.

We find that there is no difference in the amount of information revealed per analyst cluster pre- and post-FD across all event types. The increase in the amount of overall information that is publicly disclosed is mainly due to increases in the frequency of disclosures. This suggests that Reg FD has not generated an adverse

¹⁴Factor returns are obtained from Ken French's data website at mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html. We thank Ken French for providing the data.

environment for information disclosures wherein firms cease to release information or postpone its release because it is difficult to determine what is “material” under the requirements of Reg FD.

4.2.2. *Regression tests of firm-specific information.* Hypothesis 3 suggests that public information events will contain more information following the passage of Reg FD. The tests we conduct in this section address a related but different issue. Specifically, we consider whether a unit change in the analysts’ information set is associated with a larger change in stock prices in the post-FD period. Although we have shown that public disclosures are more frequent in the post-FD period, we do not expect information to be more valuable on a per unit basis.

The question we address here is whether investors respond more to analyst revisions in the post-FD period and how this response differs across different types of information events. Using the same event classifications as before, events are classified into earnings reports, earnings guidance, press releases, and “other” categories.

We measure the impact of a change in the information set on the amount of firm-specific information inside an analyst cluster by regressing our measure of firm-specific information (FSI_i) on a proxy for the change in information set ($|coneps|$), and a variable that interacts $|coneps|$ with an indicator variable (iFD) that takes the value one in the post-FD period and zero otherwise. The empirical model is given by

$$(9) \quad FSI_i = \alpha_0 + \alpha_1|coneps_i| + \alpha_2|coneps_i| \times iFD + e_i.$$

where FSI_{it} is the firm-specific information in analyst cluster i based on the market model¹⁵ and $|coneps_i|$ is the absolute value of the change in the consensus forecast over analyst cluster i , scaled by the average of stock prices during five trading days prior to the start of a cluster.¹⁶

The regression coefficients are reported in Panel A of Table 8 and are estimated using General Method of Moments. Asymptotic t-statistics are based on Newey-West standard errors that correct for serial correlation of two lags.

As expected, analysts revise their earnings forecasts during periods when firm-specific information is communicated to investors regardless of the type of information event. The magnitude of the constant terms in the regressions suggest that more information is contained in company-initiated disclosure events (earnings reports, earnings guidance, and press releases) than “other” events. Firm-specific information also is positively related to the amount of information contained in analysts’ consensus forecasts, but surprisingly, this relation is only statistically significant for press releases.

As predicted, there is no increase in investor responsiveness to the information contained in company-initiated disclosures following the adoption of Reg FD. By contrast, “other” information events are more responsive to changes in consensus forecasts in the post-FD period. Since some of the analyst clusters in this sub-sample may have formed after information was selectively disclosed to certain, influential analysts, if these analysts in turn provided this information to a select group of investors before making it available to other analysts, one would expect

¹⁵Similar results are obtained using the Fama-French three-factor model

¹⁶We use the absolute value because our measure of firm-specific information does not distinguish between good and bad news.

that the change in the consensus forecast would already be reflected in share prices. Since Reg FD is designed to eliminate this type of disclosure, we expect to find the change in the consensus forecast will reflect new information in the post-FD period. That is, once analysts no longer have the ability to provide investors with selective disclosures that enable them to effectively trade on inside information, information is revealed to analysts and investors at approximately the same time. Our results are consistent with this observation.

We estimate a second regression model that uses the same set of analyst clusters as a basis for the analysis but measures firm-specific information on a daily basis rather than aggregating across the entire cluster. The dependent variable is

$$(10) \quad DFSI_{it} = |AR_{it}|.$$

for each day t in analyst cluster i . Whereas the regression results reported in Panel A reflect one observation per analyst cluster i , Panel B reflects D_i observations per analyst cluster i where D_i is the number of days in analyst cluster i . The regression model is

$$(11) \quad DFSI_{it} = \alpha_0 + \alpha_1 |coneps_{it}| + \alpha_2 |coneps_{it}| \times iFD_i + e_{it}.$$

where $|coneps_{it}|$ is the absolute value of the daily change in the consensus forecast on day t in analyst cluster i , scaled by the average of stock prices during the last five trading days prior to the start of a cluster.¹⁷

The coefficient estimates in Panel B suggest that $DFSI_{it}$ is positively related to the amount of information revealed in an analyst cluster for company-initiated disclosures. Unlike the results for Panel A, this relation is statistically significant across all three company-initiated event types. Similar to Panel A, the passage of Reg FD does not alter the amount of information per unit of $|coneps|$.

“Other” disclosure events are insignificantly related to the amount of information contained in the consensus earnings forecast. Once again, the lack of significant price response within an analyst cluster is consistent with the observation that selective disclosure allows information to be leaked to investors before analysts adjust their forecasts. Similar to the company-initiated disclosures, there is no increase in the informativeness of $|coneps|$ in the post-FD period. This contrasts with our results in Panel A and suggests that our findings related to the informativeness of “other” events in the post-FD period are not particularly robust.

5. CONCLUSION

This paper examines how Reg FD has affected the flow of information from firms to public investors. In particular, it examines whether Reg FD has had the intended effect of eliminating selective disclosure and compelling firms to use other mechanisms to disseminate information, or whether it has had the unintended effect of reducing the amount of information firms disclose.

We address this issue by identifying the time series of material information events for a sample of 100 firms that have active analyst followings. We classify each information event according to its disclosure method. This allows us estimate how much firm-specific information is released in aggregate and through each disclosure channel.

¹⁷Similar results are obtained using the Fama-French three-factor model

We identify important information events from public sources that include dates when earnings are released, dates when firms provide earnings guidance, and dates when firms issue press releases. We also use the aggregate behavior of equity research analysts to identify other important events. These events are identified as the times when analysts revise earnings forecasts at the same time (an analyst cluster). Using cumulative abnormal returns as a proxy for firm-specific information, we evaluate if and how information flow has been altered by Reg FD. Our empirical findings suggest the following. The same amount of firm-specific information is incorporated into stock prices before and after the adoption of Reg FD. As expected, more firm-specific information is communicated using public disclosure channels after Reg FD. We find that firms use earnings guidance as a substitute for selective disclosure. Surprisingly, companies do not increase their use of press releases that are not earnings guidance.

These findings have important implications for the evaluation of the effectiveness of Reg FD and for other markets that may consider similar regulations. We conclude that the passage of Reg FD has indeed achieved its objective of “levelling the playing field” for all investors and yet encourage firms to disclose the same amount of information.

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TABLE 1. Industry, size, and trading volume statistics for sample firms.

	Mean	Median	Standard deviation	Minimum	Maximum
Number of SICs	27.00				
Firms per SIC	3.70	2.00	4.74	1.00	22.00
Size	15.94	15.86	1.46	11.83	19.24
Monthly volume (million)	1046.76	413.62	1727.48	37.78	11387.05

TABLE 2. Number of analysts and forecast revision statistics for sample firms before and after the adoption of Reg FD.

	Number of Analysts per Firm	Number of Revisions per Firm	Number of Revisions per Analyst per Firm
Before FD	23.61	116.35	5.16
After FD	24.39	141.96	5.86
Change	0.78	25.61	0.71
t-statistic	0.95	4.76	4.16

TABLE 3. Number of events.

<i>Panel A. Number of observations by event type.</i>			
	Earnings guidance	Press releases	Analyst Clusters
All events	477	1,412	15,926
Before FD	126	700	6,630
After FD	351	712	9,296
<i>Panel B. Number of observations by event type per firm.</i>			
Before FD	2.52	7.22	9.21
After FD	4.81	7.34	10.89
Change	2.29	0.12	1.68
t-statistic	5.32	0.17	2.57

TABLE 4. Average number of analyst clusters per firm and the rate an analyst cluster cluster if associated with an event.

	Earnings reports	Earnings guidance	Press releases	Other
<i>Panel A. Average number of analyst clusters per firm</i>				
Before FD	3.60	2.33	2.74	5.10
After FD	3.77	4.19	3.80	4.95
Change	0.17	1.86	1.06	-0.15
t-statistic	1.82	4.94	2.78	-0.23
Firms with clusters before FD	99	39	69	81
Firms with clusters after FD	98	72	76	92
<i>Panel B. Distribution of analyst clusters across different information events.</i>				
Before FD	47.25	12.67	22.74	
After FD	40.84	31.21	26.15	
Change	-6.41	18.54	3.41	
t-statistic	-2.04	5.13	1.06	
<i>Panel C. Rate a public information event is associated with an analyst cluster.</i>				
Before FD	72.73	67.43	27.55	
After FD	75.45	90.12	42.75	
Change	2.72	22.69	15.20	
t-statistic	1.29	3.70	4.16	

TABLE 5. Aggregate information revealed before and after Regulation FD.

Panel A reports changes in the variance of daily abnormal returns, the amount of firm-specific information revealed during the fiscal year, and the abnormal firm-specific information contained in analyst clusters using the market model to measure abnormal returns. Panel B reports the same statistics using the Fama-French three-factor model to measure abnormal returns. a and b indicate the test statistics are distributed χ^2 and Student t , respectively.

	Variance of daily abnormal returns ^a	Aggregate firm-specific information (all periods) ^b	Aggregate firm-specific information (all clusters) ^b	Aggregate firm-specific information (noncluster) ^b
<i>Panel A. Market model estimates</i>				
Before FD	0.111	3.535	0.505	3.030
After FD	0.106	3.231	0.601	2.630
Change		-0.304	0.096	-0.400
Test statistic	0.933	-1.980	2.300	-2.870
Critical level at 5% level	1.483			
<i>Panel B. Fama-French three-factor model estimates</i>				
Before FD	0.111	3.520	0.496	3.025
After FD	0.105	3.176	0.588	2.588
Change		-0.344	0.092	-0.436
Test statistic	0.944	-2.300	2.240	-3.230
Critical level at 5% level	1.483			

TABLE 6. The amount of firm-specific information revealed across all analyst clusters. Panels A and B respectively report abnormal return results based on the market and Fama-French three-factor models.

	All events	Earnings reports	Earnings guidance	Press releases	Other clusters
<i>Panel A. Market model.</i>					
Before FD	0.505	0.225	0.201	0.191	0.209
After FD	0.601	0.244	0.303	0.254	0.208
Change	0.096	0.020	0.102	0.063	-0.001
t-statistic	2.30	1.05	2.33	1.85	-0.05
<i>Panel B. Fama-French three-factor model.</i>					
Before FD	0.496	0.222	0.199	0.190	0.201
After FD	0.588	0.245	0.300	0.252	0.200
Change	0.092	0.023	0.101	0.062	-0.001
t-statistic	2.24	1.22	2.33	1.80	-0.05

TABLE 7. The amount of firm-specific information revealed per analyst cluster across different information events. Panels A and B respectively report abnormal return results based on the market and Fama-French three-factor models.

	All events	Earnings reports	Earnings guidance	Press releases	Other clusters
<i>Panel A. Market model.</i>					
Before FD	0.059	0.063	0.093	0.069	0.046
After FD	0.060	0.065	0.067	0.072	0.051
Change	0.001	0.002	-0.026	0.003	0.005
t-statistic	0.18	0.50	-1.51	0.39	0.93
<i>Panel B. Fama-French three-factor model.</i>					
Before FD	0.059	0.062	0.091	0.190	0.045
After FD	0.059	0.065	0.065	0.252	0.049
Change	0.000	0.003	-0.026	0.062	0.005
t-statistic	0.05	0.62	-1.62	0.34	0.84

TABLE 8. Multivariate General Methods of Moments Estimates of the Association between Firm-Specific Information Inside Analyst Clusters and Information Content.

he stock price reaction is measured as the absolute value of the excess return on an analyst cluster day and the amount of firm-specific information revealed per analyst cluster is the absolute value of the change in the consensus earnings forecast scaled by the stock price at the beginning of the day. t -statistics are reported in parentheses based on Newey-West standard errors that adjust for serial correlation at three lags.

	Earnings reports	Earnings guidance	Press releases	Other clusters
<i>Panel A. Firm-specific information within analyst clusters</i>				
Constant	5.974 (26.22)	6.529 (15.83)	6.059 (17.59)	3.822 (23.50)
$ coneps $	1.478 (1.40)	2.077 (1.53)	2.812 (2.48)	0.450 (0.39)
$ coneps \times iFD$	0.519 (0.44)	0.836 (0.49)	0.960 (0.60)	0.043 (3.06)
Adjusted R^2	0.0192	0.0322	0.059	0.0411
Observations	649	393	458	868
<i>Panel B. Firm-specific information per day within an analyst cluster</i>				
Constant	2.885 (42.53)	3.020 (29.52)	2.942 (29.73)	2.319 (36.73)
$ coneps $	2.979 (3.27)	3.521 (1.77)	3.968 (2.64)	1.681 (1.49)
$ coneps \times iFD$	-0.327 (-0.30)	0.329 (0.15)	0.030 (0.02)	1.632 (1.11)
Adjusted R^2	0.0283	0.0501	0.047	0.0168
Observations	2502	1406	1684	2396