

# **Informational Effects of Regulation FD: Evidence from Rating Agencies**

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# **Informational Effects of Regulation FD: Evidence from Rating Agencies**

## **ABSTRACT**

This paper studies changes in the information environment brought about by Regulation Fair Disclosure (FD), which was implemented on October 23, 2000. FD now prohibits U.S. public companies from making selective, non-public disclosures to favored investment professionals. FD, however, has a number of exclusions, one of which still allows disclosure of non-public information to credit rating agencies. As a result, credit analysts at rating agencies now have access to confidential information that is not made available to equity analysts any more. This can potentially increase the value of credit ratings to equity investors. We examine a sample of credit rating changes and their effect on the company's stock price. We find that the informational effect of downgrades and upgrades is much bigger in the post-FD period. Apparently, FD conferred a strategic advantage to the ratings agencies.

JEL Classifications: G18, G14, G28, K22

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## I. INTRODUCTION

On October 23, 2000, the Securities and Exchange Commission (SEC) implemented Regulation Fair Disclosure (FD). FD requires that U.S. public companies that intentionally disclose material, nonpublic information to a select group also disclose it simultaneously to the public. The goal of FD was to eliminate selective disclosure to a few privileged interested parties, thereby creating a more even playing field for all investors. In particular, selective disclosure to equity analysts was widely perceived as market abuse.

The introduction of FD, however, was controversial. Critics have claimed that it would lead to fewer disclosures and lower quality of analyst forecasts, and thus dramatically impoverish the information environment.<sup>1</sup> This explanation is too simple, however. There are many types and channels of transmission of information to investors. Companies can decide to compensate the effect of FD by increasing their public disclosures. Equity analysts can offset the loss of selective disclosure by privately searching for additional information. Alternatively, any loss of information through equity analysts could be offset by other channels of information, such as credit rating agencies.

Indeed, early evidence by Heflin et al. (2003) does not indicate any degradation in the information environment. They report that companies significantly increased the quality and quantity of information dissemination through public disclosures after October 2000. The number of disclosures, in particular earnings-related ones, more than doubled.<sup>2</sup> While there is some mixed evidence that the forecast dispersion by analysts has generally increased, indicating more disagreements across analysts,<sup>3</sup> Heflin et al. (2003) and Bailey et al. (2003) report that FD

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<sup>1</sup> See for instance the comments from Merrill Lynch, SEC (2000b) and survey by the Association for Investment Management and Research (2001).

<sup>2</sup> This may have been also facilitated by technological developments that made it easier for issuers to disseminate information broadly, such as Internet webcasting and teleconferencing

<sup>3</sup> Bailey et al. (2003), Irani and Karamanou (2003), Mohanram and Sunder (2003), and Topaloglu (2002) document significant increases in analyst forecast dispersion after FD. In contrast, Heflin et al. (2003) report no increases in

had little effect on the forecast accuracy of analysts.<sup>4</sup> The interpretation is that analysts did offset the loss of selective disclosure by privately searching for additional information or by benefiting from improved public information.

Finally, Heflin et al. (2003) report that the information gap, measured by the size of abnormal stock price changes around earnings announcements, actually decreased after FD was put in place. The substance of these results is confirmed by Eleswarapu et al. (2003), who report that the overall information flow was unchanged after FD. They also find that the asymmetry in information, as reflected in the adverse selection component of trading costs, has been reduced. This was the primary goal of FD.

One aspect of FD that has been hitherto unexplored is the relative change in the information environment for groups not covered by FD. Regulation FD covers persons such as securities analysts, market professionals, institutional investors, or others who regularly make or would reasonably be expected to make investment decisions involving the issuer's securities.<sup>5</sup> Under 17 CFR 243.100(b)(2)(iii), however, an exemption was granted to ratings agencies.<sup>6</sup> The rationale for this exemption was because agencies are not selectively disseminating information and because without this exemption, investors would receive lower quality information from the

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forecast dispersion, after controlling for other effects, including greater earnings variability in the post-FD period. Also, Gintschel and Markov (2003) show that the absolute price impact of information disseminated by analysts dampened in the post-FD period.

<sup>4</sup> Forecast accuracy is measured using the absolute value of the difference between actual earnings and the mean or consensus forecast.

<sup>5</sup> Rule 100(b)(1) enumerates four categories of persons to whom selective disclosure may not be made absent a specified exclusion. The first three are securities market professionals -- (1) broker-dealers and their associated persons, (2) investment advisers, certain institutional investment managers and their associated persons, and (3) investment companies, hedge funds, and affiliated persons. The fourth category is any holder of the issuer's securities, under circumstances in which it is reasonably foreseeable that such person would purchase or sell securities on the basis of the information.

<sup>6</sup> Rule 100(b)(2) sets out four exclusions from coverage. The first is for a person who owes the issuer a duty of trust or confidence, e.g. an attorney, investment banker, or accountant. The second is for a person who expressly agrees to maintain the information in confidence. The third is for credit rating agencies, provided the information is solely collected for the purpose of developing a credit rating and that credit ratings are made publicly available. The fourth deals with communications made in connection with public offerings.

rating agencies. For example, Moody's, a rating agency, argued that the exemption "*merely preserved the 'status quo ante'.*"<sup>7</sup>

Instead, one could argue that the status quo has not been preserved, relative to other groups. Credit analysts at rating agencies now have access to confidential information that is not made available to other securities professionals any more. This can potentially increase the value of credit ratings to the public.<sup>8</sup> Moody's, for instance, states that "[o]ur ability to consider sensitive information judiciously... is highly valued by most market participants."<sup>9</sup> Fitch states that "Nonpublic information frequently includes budgets and forecasts, as well as advance notification of major corporate events such as a merger."<sup>10</sup> This confidential information is no longer available to equity analysts and should improve the value of credit ratings. The purpose of this paper is to test whether FD had a significant impact on the information content of credit ratings. If so, this could help to explain why the overall information environment has not degraded.

Previous research on the information content of rating agency announcements has shown mixed results: Downgrades have a significant impact on daily stock prices, but upgrades do not seem to have much effect. Holthausen and Leftwich (1986) use a sample of 1,014 ratings changes by Moody's and S&P over the 1977-82 period. In the case of downgrades, they report a 2-day abnormal average return of -2.66 percent, which is large and statistically significant. Upgrades are associated with an abnormal return of +0.08 percent, which is not significant.<sup>11</sup>

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<sup>7</sup> See SEC (2002b), Footnote 12.

<sup>8</sup> This alternative channel of selective information to the public could also explain why the informational environment apparently has not been harmed by FD.

<sup>9</sup> See SEC (2002b), Section II, Paragraph 2. Moody's asserts that a ratings decision is made public along with the reasoning for the rating action. The press release, however, should not contain non-public information.

<sup>10</sup> See SEC (2002a), Section 3.

<sup>11</sup> One problem is that ratings announcements may occur as other major news hit the market, thus making the effect more difficult to ascertain. Holthausen and Leftwich (1986) distinguish ratings changes from other news, by separating the sample into "contaminated" observations if there is a concurrent *Wall Street Journal* information release in a four-day window around the rating change. In the case of downgrades, they report an abnormal average

Similar results were found in more recent studies by Hand et al. (1992), and Dichev and Piotroski (2001).<sup>12</sup>

The downgrade effect is consistent with several hypotheses: either downgrades impose real costs on the affected firms, or the ratings agencies do provide valuable information to markets. In the first case, the fall in the stock price represents the capitalized value of higher borrowing costs. In the latter case, it is not clear why only negative information is valuable. Ederington and Goh (1998) argue that this could happen because companies voluntarily release good news to the market but are reluctant to release unfavorable information. So, there is a bias toward negative information content. Or, rating agencies could expend more resources in detecting deterioration in credit quality rather than improvements.<sup>13</sup>

This paper examines the change in information content of ratings announcement before and after FD, focusing on abnormal stock returns around the news. The hypothesis is that, if ratings agencies now have access to selective information that cannot be disclosed to other agents, the information content, or stock price effect, will be larger. Indeed we find that, relative to the pre-FD period, downgrades are associated with greater falls in stock prices. Upgrades are associated with greater increases in stock prices, which now become statistically significant.

In addition to these time-series results, we find that the informational effects of FD are more pronounced for firms with greater analyst following and larger firms. This is consistent

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return of -4.77 percent for contaminated observations (183 observations), and -0.96 percent for non-contaminated ones (224 observations). Both numbers, however, are statistically significant.

<sup>12</sup> In a later study on the same sample, Hand et al. (1992) also examine the effect of ratings changes on daily bond prices. Results are not consistent across stocks and bond markets, with weaker effect for bonds, perhaps due to lower quality of price data for corporate bonds relative to stocks. More recent work by Dichev and Piotroski (2001) use all of Moody's announcements over 1970 to 1997, which is a larger sample of 4,727 observations. Although they mainly focus on long-run returns following ratings changes, they also report a 3-day price effect of -1.97 percent for downgrades and +0.48 percent for upgrades. This confirms that the downgrade effect is much stronger. Both effects are significant in this later study, in part due to the increased power from the larger sample size. The upgrade effect is still much smaller, though, than the downgrade effect.

<sup>13</sup> Ederington and Goh (1998) examine the pattern of earnings before and after ratings changes. Downgrades are preceded by declines in earnings but they also forecast falling earnings. In contrast, they find little change in earnings before and after upgrades.

with the argument that such firms were more likely to practice selective disclosure to curry analyst favors, and hence are more likely to be affected by FD.<sup>14</sup>

One drawback of this study, like all others on FD, is that the reported effects could be coincidental. After all, we have only one event date. Other contemporaneous events, such as the economic downturn, could have conceivably led to our time-series results. Controlling for the economic recession does not change the results, however. In addition, the cross-sectional evidence using number of analysts and firm size increases our confidence in attributing the reported effects to FD rather than to confounding circumstances.

The contributions of this study are twofold. First, this study examines the informational effects of FD from the perspective of rating agencies. Like equity analysts, credit analysts at rating agencies strive to generate information useful to financial markets. Rating agencies, however, remain the main conduits of selective disclosures after FD. This study, hence, complements the growing body of research on FD, which has focused on equity analysts. Second, our findings also contribute to the extant literature on the information content of rating changes. For example, we find that the stock market reaction to upgrades, generally insignificant in prior studies, became significant after FD. This result is especially important given the increased role given to ratings agencies in credit risk models, which are now sanctioned by the Basel Committee on Banking Supervision for bank capital adequacy.<sup>15</sup>

The remainder of the paper is organized as follows. Section II provides a brief review of the credit rating process. Section III describes data and descriptive statistics. Section IV presents empirical results. Section V concludes.

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<sup>14</sup> Indeed, Lees (1981) reports that interviews with company executives are considered the most important source of information by analysts. Lang and Lundholm (1993), (1996) argue that analysts place high value on firms' investor relations, including response to analyst questions and accessibility of management. This factor is found to be one of the most significant determinants of analyst following.

<sup>15</sup> See the discussion of the Basel 2 proposals in BCBS (2003).

## II. THE CREDIT RATING PROCESS

The major U.S. bond rating agencies are Moody's Investor Service, Standard and Poor's (S&P) corporation, and Fitch Investors Service. These three agencies are the only Nationally Recognized Statistical Rating Organizations (NRSRO), officially recognized by the Securities and Exchange Commission. For most U.S. corporate ratings, S&P and Moody's are the only firms used.

Rating agencies cover a variety of publicly traded securities, including corporate bonds, commercial paper, and municipal bonds. A credit rating is an evaluation of creditworthiness. More technically, it has been defined by Moody's, as an "*opinion of the future ability, legal obligation, and willingness of a bond issuer or other obligor to make full and timely payments on principal and interest due to investors.*"<sup>16</sup>

Table 1 presents the interpretation of various credit ratings issued by the three major rating agencies. S&P rates bonds from AAA down to D. Each letter is known as a "class". For the AA to CCC classes, S&P also supplies modifiers, e.g. A+, A, A-. Similarly, Moody's rates bonds from Aaa to C, with modifiers such as A1, A2, A3. Fitch's ratings symbols are nearly identical to S&P's. In what follows, we will transform the credit ratings into a cardinal scale, starting with 1 as AAA, 2 as AA+, 3 as AA, 4 as AA-, and so on until 23 as the default category.<sup>17</sup>

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<sup>16</sup> See Moody's (2003).

<sup>17</sup> We chose 23 instead of 22 for the default category because Fitch provides three ratings for default. This corresponds to its average rating of DD. Our sample has few defaults, however, so that the choice of this number is not important.

**Table 1. Classification by Credit Ratings**

Explanation	Standard & Poor's (Modifiers)	Moody's Service (Modifiers)	Fitch Service (Modifiers)	Cardinal Scale
<b><u>Investment grade:</u></b>				
Highest grade	AAA	Aaa	AAA	1
High grade	AA (+, none,-)	Aa (1,2,3)	AA (+, none,-)	2, 3, 4
Upper medium grade	A (+, none, -)	A (1,2,3)	A (+, none, -)	5, 6, 7
Medium grade	BBB(+, none,-)	Baa (1,2,3)	BBB(+, none,-)	8, 9, 10
<b><u>Speculative grade:</u></b>				
Lower medium grade	BB (+, none,-)	Ba (1,2,3)	BB (+, none,-)	11, 12, 13
Speculative	B (+, none,-)	B (1,2,3)	B (+, none,-)	14, 15, 16
Poor standing	CCC (+, none,-)	Caa (1,2,3)	CCC	17, 18, 19
Highly speculative	CC	Ca	CC	20
Lowest quality, no interest	C	C	C	21
In default	D		DDD/DD/D	23

These ratings definitions correspond to long-term debt. Other definitions apply to short-term debt. Ratings are broadly divided into “Investment Grade,” that is, at and above BBB for S&P and Baa for Moody's, and “Speculative Grade,” or below investment grade, for the rest. This distinction is sometimes important, because some investors are prohibited from holding non-investment grade bonds. Thus a downgrade to non-investment grade forces them to sell the affected bonds.

Ratings can be given for an issue or issuer. An issue credit rating is an opinion of the creditworthiness of an obligor with respect to a specific (class of) financial obligation. An issuer credit rating is an opinion of an obligor’s overall financial capacity (its creditworthiness) to pay its financial obligations. Specific bonds can be rated higher or lower than the issuer rating, depending on their relative priority. In what follows, we use the issue rating, consistent with existing studies on the information content of credit ratings.

Most corporations approach the agencies to request a rating in advance of issuing debt, e.g. to assess the impact of issuing additional debt on the company’s rating. After receiving the

rating request, the agencies assign a team of analysts with relevant industry expertise to the issuer. While the whole team is responsible for the credit assessment of the company, there is one primary analyst who takes the lead in making regular contact with the issuer and in overseeing the rating process. Credit ratings are based on both public and non-public information. Among public information, they use accounting ratios, such as leverage and the ratio of interest payments to earnings or cash flows, derived from publicly released financial statements. The credit analysts, however, do conduct meetings with management, during which they may be provided with confidential information, such as profit breakdowns by products, new product plans, financial projections, capital spending plans, and minutes of board meetings.<sup>18</sup> At other points in time, companies are also encouraged to discuss hypothetical transactions, such as acquisitions of new financings. Ratings are assigned by a committee, and the issuer is provided with an opportunity to respond. When a rating is made public, the explanation given by the agencies refers only to public information. This is to ensure that the sensitive information provided by the issuer is kept in strict confidence. After Regulation FD, credit analysts at rating agencies have maintained access to confidential information that is no longer available to stock analysts.

The process for ratings revisions, which constitute our sample, is similar. Companies are assigned a primary analyst who is in periodic contact with the company to discuss ongoing developments. Management meetings are scheduled at least annually, or whenever performance deviates significantly from expectations. Also, rating agencies encourage companies to discuss transactions that are being contemplated. As with initial ratings, this process provides confidential information to agencies.

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<sup>18</sup> See Standard and Poor's (2003), page 12. Ederington and Goh (1998) claim that some of this information is not available to stock analysts. After the initial meeting for new debt, surveillance is performed by annual meetings with management.

### III. DATA AND DESCRIPTIVE STATISTICS

To assess the impact of FD on the information content of credit ratings, we analyze the stock market reaction to debt rating changes before and after FD. The post-FD period begins from November 2000 (the first month after FD's effective date—October 23, 2000) and ends in December 2002. The pre-FD period spans August 1998 to September 2000. Therefore, each of the two periods has equal length of 26 months. Our choice of relatively long sample periods is motivated by our desire to maximize our sample size.

We gather the rating changes data from the Mergent Fixed Investment Securities Database (FISD). The FISD contains detailed information on over 90,000 corporate, U.S. Agency, U.S. Treasury debt securities. Debt rating information includes ratings from S&P, Moody's and Fitch since April 1995. The database also provides descriptive information about the issuer such as issuer name, stock ticker, exchange listing, date and details of bankruptcy, if applicable. We confine the sample to U.S. domestic taxable corporate bonds, excluding Yankee bonds and bonds issued through private placement. Each bond rating change constitutes one sample observation. In the case of rating changes pertaining to multiple bond issues of the same issuer on the same date, we retain the issue with the largest magnitude of rating change because the issue is likely to result in the strongest impact on stock prices. The FISD also provides effective dates for new ratings. We use them as ratings announcement dates for this study.<sup>19</sup>

A potential concern in assessing the information content of ratings changes is that their effect may be contaminated by other firm-specific press releases. Such contamination could increase the size of the stock market reaction (e.g., Holthausen and Leftwich 1986), although should not bias the coefficient on the FD effect as long as contamination is similar in the pre- and post-FP period. The database has a variable indicating the specific reason for a rating change.

We exclude from the sample rating changes associated with entries called “mergers and acquisitions” and “market conditions,” on the grounds that these events could contaminate the information content of ratings news.<sup>20</sup> Just to be sure, we also repeat the analysis with a narrower “non-contaminated” sample, identified by searching the Wall Street Journal (WSJ) Abstract using firm name. An observation is considered as contaminated if any firm-specific price-relevant information appears in the WSJ within a three-day window surrounding the event day of rating change. Our non-contaminated sample excludes Enron and Worldcom, two spectacular cases of downgrades. We expect the price impact of rating changes to be less for the non-contaminated sample. In addition, the smaller sample will reduce standard errors and the power of the tests.

Our sample selection also requires the availability of daily stock returns for the sample firms and major market indices to compute abnormal stock returns. The final sample consists of 1,767 downgrades and 437 upgrades. Approximately 90 percent of the rating changes are from Moody’s and S&P. The remaining 10 percent of the sample consists of Fitch ratings.

[Table 2 here]

Panel A in Table 2 provides the distribution of size and number of rating changes by year and sample period. The ratio of number of upgrades to downgrades is low, but is in line with previous studies.<sup>21</sup> For every upgrade, we had four downgrades. This could reflect a deterioration of credit quality over the sample period, or the tightening of credit standards, as

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<sup>19</sup> We randomly compare some of the sample effective dates with actual press release dates for the rating changes collected from Lexis-Nexis. The news announcements dates all fall within our event window of day -1 to day +1 with the vast majority (90%) of the announcement dates identical to the ratings effective dates.

<sup>20</sup> This approach is conservative because it assumes that the M&A announcement, for example, occurs close to the announcement of the rating change. If in fact, the M&A announcement had come much earlier, simultaneity would not be a problem.

<sup>21</sup> This result is typical of other studies on bond ratings changes. Dichev and Piotroski (2001), for instance, report twice as many downgrades as upgrades over the period 1970 to 1987. Bonds are typically issued with a high credit rating which afterwards drifts down.

indicated by Blume, Lim, and Mackinlay (1998). The number of downgrades is also higher in the post-FD period, which reflects the 2001 economic recession. While our analysis is predicated on a fixed sample period, we will show later that our results seem robust to the effect of this recession.

Panel B breaks down the sample into contaminated and non-contaminated observations. We find very similar percentages of contamination before and after FD. For downgrades, about 22% of the sample is contaminated, versus about 25% post-FD. The difference is significant for neither downgrades nor upgrades.

The size or magnitude of a rating change is the difference between the cardinal value of new rating and that of old rating of the same bond issue. The average level of rating changes appears to be very stable over time. It does not differ much across the pre- to post-FD periods, for downgrades and upgrades. The stability of rating changes alleviates a potential concern that the magnitude of rating changes could drive the differential stock response to the rating news between the pre- and post-FD periods.

[Table 3 here]

Table 3 presents additional descriptive evidence of bond rating changes. An examination of the sample distribution by the magnitude of rating change in Panel A reveals that roughly 95 percent of downgrades experience revisions of no more than three grades, and that more than 55 percent of the bond ratings are revised down by one grade only. Upgrades, on the other hand, typically involve smaller revisions. More than 78 percent of all revisions are for one grade only. The frequency distribution of magnitudes of rating changes is very similar across the pre- and post-FD sub-samples.

Panel B provides a breakdown into three categories: “within class,” “across class,” and “across investment grade”. A rating change is defined as “within class” if the change is from one gradation to another of the same letter class (e.g., AA to AA-). All the other rating revisions are classified as “across class” because they result in a change in rating from one letter class to the other (e.g., BB- to B). From the “across class” category, we further identify a sub-group of bond issues whose ratings are changed from investment grade to speculative grade or vice versa. These issues constitute the “across investment grade” category.

A couple of observations emerge from Panel B. First, the percentage distribution of rating changes across the three categories is very similar for the pre- and post-FD periods. Second, the majority (55 percent) of downgrades are *across* classes. In contrast, the majority (57 percent) of upgrades are *within* a class. To the extent that stocks react more strongly to “across class” revisions relative to “within class” revisions, the lower frequency of “across class” revisions for upgrades could contribute to weaker abnormal stock response to upgrade announcements. For our purposes, however, the most important observation from table 3 is that the pre- and post-FD samples compare well with each other in terms of the magnitude and types of rating changes.

#### IV. EMPIRICAL ANALYSIS

The objective of this study is to examine the effect of FD on the information content of rating changes in the stock market context. Employing the standard event study methodology, we compare the stock market reaction to bond rating changes before and after FD. The daily abnormal return is estimated as the difference between the daily raw stock return  $R_{jt}$  and the contemporaneous value-weighted NYSE/AMEX/NASDAQ index return  $R_{mt}$ . As Holthausen and Leftwich (1986) argue, results over short intervals such as the window immediately around

the event, are not sensitive to alternative specifications. We verify that our main results in this section are not affected when the expected returns are estimated using a market model or equally weighted market index return.

Cumulative abnormal returns, CAR, are calculated over the three-day event window (-1, 0, +1), where day 0 is the new rating effective date<sup>23</sup>. The *raw* CAR for event  $j$  is

$$CAR_j = \sum_{t=-1}^{+1} (R_{jt} - R_{mt})$$

Because there is substantial cross-sectional variation in the volatility of excess returns, and because some of our regressions use variables, like size, that are correlated with volatility, we also follow the standard event-study approach that relies on the *standardized* CAR

$$SCAR_j = \frac{CAR_j}{\hat{\sigma}(R_j - R_m)\sqrt{3}}$$

where the standard error of CAR in the denominator above is computed over the whole sample period.<sup>24</sup> The dependent variable is now close to a standard normal variable. Across all firms in the sample, the average standard error is approximately 4.5% over the 3-day event window.

Previous research generally shows that stock prices react to downgrades but not to upgrades (e.g., Holthausen and Leftwich 1986; Hand, Holthausen and Leftwich 1992; Ederington and Goh 1998). Consistent with these studies, we examine downgrades and upgrades separately. In what follows, we first present univariate results and then perform across-sectional multivariate regressions controlling for the other determinants of the stock market reaction to rating news. Finally, we conduct sensitivity checks of our main results.

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<sup>23</sup> This is to ensure that the window includes the announcement date, which we sometimes found to be measured imprecisely.

<sup>24</sup> We also tested if the greater information content of ratings changes could not simply be due to greater volatility during the post-FD period. We constructed an equally-weighted portfolio with all the firms in the sample. The

## A. Main Results

### *Univariate Evidence*

Table 4 summarizes the mean and median stock price effect of rating changes for the pre- and post-FD periods. Panel A describes the raw CARs, panel B the standardized CARs. Several observations emerge from the table. For the downgrades sample, the mean CARs over the three-day rating change window are negative and significant at the one percent level for the pre- and post-FD periods. Most interestingly, the effect is much stronger post-FD. The size of the mean CAR increases from -4.57% pre-FD to -6.93% post-FD. The difference of -2.37% is statistically significant at conventional levels. The non-contaminated CARs are smaller in magnitude, as expected. The difference is still significant, however. Similar conclusions hold for the standardized CARs, which will be used in the subsequent cross-sectional analysis.

For the upgrades, in line with existing studies, we do not find significant market reaction to the rating changes in the pre-FD period. However, the mean CAR for the post-FD rises to 1.42 percent; the effect now becomes *significant* at the one percent level, even though the sample is much smaller (127 post-FD versus 310 pre-FD). This is an interesting finding, as previous research generally documents no abnormal stock performance around upgrades. Moreover, the change in the mean CAR is economically and statistically meaningful.<sup>25</sup> Similar results hold for the non-contaminated sample, as well as the standardized CARs.

[Table 4 here]

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volatility was 0.74% pre-FD, and 0.54% post-FD; the difference is significant. Because the volatility drops after FD, our results cannot be attributed to an increase in volatility.

### *Cross-Sectional Multivariate Regressions*

In what follows, we employ multivariate regressions to control for the other variables that could affect the informational effect of rating change to stock prices. In line with Holthausen and Leftwich (1986), we estimate the regressions separately for the upgrades and downgrades samples in the following form:

$$SCAR_j = \alpha_0 + \alpha_1 RFD_j + \alpha_2 RCHANGE_j + \alpha_3 IGRADE_j + \alpha_4 DAYS_j + \varepsilon_j \quad (1)$$

where for bond  $j$ , SCAR is the standardized cumulative abnormal return defined as the bond issuer's daily stock return minus the contemporaneous return on the value-weighted NYSE/AMEX/NASDAQ index, calculated over the three-day event window (-1, 0, +1), where day 0 is the effective date of a rating change; RFD is a dummy variable, set equal to one if an observation is from the post-FD period, and zero otherwise; RCHANGE is the absolute magnitude of the rating change – the cardinal value of new rating minus the cardinal value of old rating of the same bond (1 for rating AAA, 23 for rating D); IGRADE is a dummy variable set equal to one if a bond is revised from investment grade to speculative grade or vice versa, and zero otherwise; DAYS is the natural log of the number of days since the previous rating change in the same direction, and the variable is set equal to 1200 if there are no bond revisions in the same direction in the sample period.<sup>26</sup>

The variable of interest is the coefficient on RFD, which gauges the informational impact of FD. If rating changes become more informative to stock investors after FD, then we would

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<sup>25</sup> Note that the distributions are asymmetric because of the sample design. When conditioning on downgrades, the proportion of negative observations increases. Because of this skewness, the mean CAR is below the median. We also verified, through an influence analysis, that our main results were not affected by a few outliers.

<sup>26</sup> The average length between two consecutive rating revisions of the same bond in the same direction is 142 and 308 days for our downgrades and upgrades samples, respectively. We tried alternative values in place of 1200 and obtained similar results.

expect the coefficient on RFD to be negative (positive) for the downgrades (upgrades).

RCHANGE has been documented by existing research as a key determinant of the stock price impact of rating changes. *Ceteris paribus*, the larger the RCHANGE variable is, the larger the stock price response should be. We expect the coefficient on RCHANGE to be negative (positive) for downgrades (upgrades). The variable IGRADE controls for the possibility that across-class rating revisions that shift a bond into or out of investment grade are associated with larger abnormal stock performance. We therefore expect a negative (positive) sign on IGRADE for downgrades (upgrades). Finally, for the DAYS variable, the larger the distance between two consecutive rating changes of the same direction, the more likely each of the rating changes generates new information to the stock market; on the other hand, the larger distance could also increase the likelihood that the information in a rating change is preempted by other news events, consequently reducing the informational value of the rating change. Therefore, the sign on DAYS is ambiguous.

Table 5 reports the multivariate regression analysis. Panel A describes the total sample, Panel B the non-contaminated sample. The coefficient on RFD for the downgrades regression is -0.31 and significant at the one percent level, suggesting that the average stock reaction to bond downgrading news is significantly stronger after FD than before FD. This implies an excess return for the average stock of approximately  $-0.31 \times 4.5\%$ , or -1.4%. The coefficient on RCHANGE implies that the marginal effect of downgrade in rating of one grade (e.g., from BB to BB+) on abnormal stock returns is -0.27. Similarly, the coefficient on IGRADE, which measures the effect of a downgrade from investment grade to speculative grade, is negative and significant. The significantly positive coefficient on DAYS is consistent with the argument that less frequent rating changes are less timely, more likely preempted by other news, and consequently have a weaker informational effect on stock prices.

[Table 5 here]

For the upgrades, the coefficient on RFD is +0.25, suggesting that FD has an economically and statistically significant impact on the information content of rating changes. The other control variables are all insignificant. This is consistent with prior studies (e.g., Holthausen and Leftwich 1986) that generally find less stock market reaction to upgrades. There are also much fewer observations with a rating improvement greater than one grade, or across the investment-grade cutoff.

Panel B shows similar results for the narrower, non-contaminated sample. The size of the coefficients is systematically smaller, as expected. Even with the smaller number of observations, our previous results are still statistically significant. In the following tables, we do not report the non-contaminated sample, because the results are consistent with the total sample.

## **B. Sensitivity Analysis**

### *Business Cycle and the Stock Market Reaction to Rating Changes*

Our post-FD sample period from November 2000 to December 2002 includes the recent economic recession that, according to the National Bureau of Economic Research, began in March 2001 and ended in November 2001. This raises a possibility of whether the economic recession may contribute to the stronger stock reaction to rating news after FD. For example, one could argue that during an economic recession investors are more pessimistic and tend to overreact to downgrades.<sup>27</sup> Conversely, an upgrade during a bleak economic environment is more likely to be perceived favorably by stock investors. To assess whether the economic recession may bias our results, we estimate the following regression:

$$SCAR_j = \alpha_0 + \alpha_1 BCYCLE_j + \alpha_2 RCHANGE_j + \alpha_3 IGRADE_j + \alpha_4 DAYS_j + \varepsilon_j \quad (2)$$

where BCYCLE is a dummy variable, equal to one if an observation is from the period of November 2000 to November 2001, which contains the official recession period, and zero otherwise. The other variables are the same as those for regression (1). We estimate the regression (2) based only on the post-FD sample to abstract away from the FD effect. A significantly negative (positive) coefficient of BCYCLE for the downgrades (upgrades) sample would indicate that our finding of the stronger stock reaction to rating changes after FD is confounded by the latest economic recession. The regression results are tabulated in Table 6.

[Table 6 here]

The coefficient on the key variable, BCYCLE, is +0.52 (positive, with t-statistic of 3.82) and -0.25 percent (negative, with t-statistic of -1.22) for the downgrades and upgrades, respectively. Apparently, the recession brings both the downgrade effect and upgrade effect closer to zero. Thus, it is unlikely that the business cycle is an alternative explanation for our results.<sup>28</sup>

#### *Firm Size and the Informational Impact of FD on Rating Changes*

The SEC promulgated Regulation FD in October 2000 in an effort to curtail firms' selective disclosure of value-relevant information to favored investors. It has been long alleged that security analysts and institutional investors were among the primary beneficiaries, who had access to firm management for private information before FD. Prior research shows that the stocks of larger firms are more extensively held by institutional investors (Gompers and Metrick 2001), and that larger firms have greater stock analyst following (Lang and Lundholm 1996).

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<sup>27</sup> However, a counter argument could be that the stock market response to downgrades is weaker in a recession, as downgrades become more frequent in an economic downturn and hence are more likely expected by the investors.

<sup>28</sup> As a further check, we added data to March 2003 and separated the post-FD sample into a weak stock market period, November 2000 to September 2002, and a market recovery period, from October 2002 to March 2003. Using downgrade data (there were not sufficient numbers of upgrades), we find that the prior period also has a positive coefficient, which confirms the results in Table 6.

Further, larger firms held more closed conference calls – a popular medium for selective disclosure, as conference calls were generally restricted to select audience prior to FD (Frankel, Johnson, and Skinner 1999; Bowen, Davis, and Matsumoto 2002).<sup>29</sup> Taken together, these findings suggest that large firms were more likely to practice selective disclosure than small firms.

Thus, we conjecture that FD had a greater impact on the disclosure practices of larger firms. The informational effect of FD on rating changes should be stronger for large firms than for small firms. We test our conjecture by estimating the following regression:

$$SCAR_j = \alpha_0^L SIZEL_j + \alpha_0^S SIZES_j + \alpha_1 RFD * SIZEL_j + \alpha_2 RFD * SIZES_j + \alpha_3 RCHANGE_j + \alpha_4 IGRADE_j + \alpha_5 DAYS_j + \varepsilon_j \quad (3)$$

where SIZEL (SIZES) is a large (small) firm size dummy variable, set equal to one if a bond issuer's market value of equity at the end of fiscal year 1999 is greater (less) than the sample median and zero otherwise. The other control variables are the same as in regression (1).

Table 7 presents the results of regression (3). For downgrades, the coefficient on RFD\*SIZEL is -0.51, which is higher in magnitude than that of RFD\*SIZES., which is -0.21. Further, for upgrades, the coefficient on RFD\*SIZEL is 0.47, more than four times the coefficient for small firms. These results provide some support for our conjecture that FD has a greater informational effect on rating changes for larger firms.

[Table 7 here]

### *Analyst Following and the Informational Impact of FD on Rating Changes*

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<sup>29</sup> A survey by the National Investment Relations Institute reports that, of firms hosting conference calls in 1998, only 14 percent allowed individual investors real-time access.

In the previous split-sample analysis, we argue that firm size is associated with the extent of selective disclosure prior to FD. A limitation of this approach is that firm size has been documented to be correlated with many other factors such as firm risk and overall corporate disclosure policy (Fama and French 1993; Land and Lundholm 1996).

To provide further evidence on the informational effect of FD, we now choose the number of analysts following a firm as a proxy for the amount of information selectively disclosed by the firm to outside investors. Our choice is motivated by the wide-spread belief that analysts were among the primary beneficiaries of selective information. Hutton (2003) documents that firms with higher analyst following were more likely to provide private earnings guidance to analysts. In addition, Bushee et al. (2003) report that firms providing closed conference calls have a greater number of analyst following. To the extent that firms with greater analyst following were more likely the ones that made selective disclosure, we hypothesize that FD had a greater impact on the informational value of rating changes for firms followed by the larger number of analysts. The hypothesis is tested using the regression:

$$SCAR_j = \alpha_0^L AFL_j + \alpha_0^S AFS_j + \alpha_1 RFD * AFL_j + \alpha_2 RFD * AFS_j + \alpha_3 RCHANGE_j + \alpha_4 IGRADE_j + \alpha_5 DAYS_j + \varepsilon_j \quad (4)$$

where AFL (AFS), a large (small) analyst following dummy variable, is set equal to one if a bond issuer has the number of stock analysts following it at the end of fiscal year 1999 greater (less) than the sample median and zero otherwise. The regression employs the same control variables as before. Table 8 reports the results of regression.

[Table 8 here]

Consistent with our expectation, the coefficient on RFD\*AFL is much higher in magnitude than that on RFD\*AFS for the both downgrades and upgrades. This corroborates the

hypothesis of stronger informational effect of FD on credit rating changes for firms with greater analyst following.<sup>30</sup>

## V. CONCLUSIONS

The empirical evidence in this paper indicates that Regulation FD altered the informational advantage of ratings agencies. After FD, rating agencies remained the main conduits of selective disclosures to the public. As a result, we find that the effect of ratings changes on stock prices became more pronounced. Both downgrades and upgrades now have a bigger effect on stock prices. FD did more than preserve the “status quo ante”, as argued by Moody’s. Apparently, FD conferred a strategic advantage to the agencies. No doubt this explains why the agencies lobbied in favor of FD and argued that it was necessary to add a specific exemption to the disclosure requirements for rating agencies.

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<sup>30</sup> We also used the market-to-book ratio as a proxy for informational differences, using a partition around the median ratio. Growth firms are more likely to create asymmetries of information than value firms, as growth firms have larger amounts of intangible investments whose benefits are much more risky and uncertain. Growth firms are also more extensively followed by analysts (Barth et al. 2001). The results are supportive of the informational argument. The downgrade coefficient for growth firms is 50% higher than that for value firms. The upgrade coefficient is slightly higher.

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**Table 2****Panel A: Distribution of Number and Size of Bond Rating Changes by Year and Period**

Year/Period	Downgrades		Upgrades	
	Number	Size	Number	Size
1998	[151]	1.70	[70]	1.20
1999	[373]	1.73	[142]	1.21
2000	[351]	1.57	[113]	1.41
2001	[528]	1.76	[86]	1.28
2002	[364]	1.65	[26]	1.92
Pre-FD	[777]	1.68	[310]	1.29
Post –FD	[990]	1.70	[127]	1.38
Total	[1767]	1.69	[437]	1.32

**Panel B: Percentage of Contaminated Rating Changes Pre- and Post-FD**

Period		Downgrades		Upgrades	
		Number	%	Number	%
Pre-FD	All Sample	[777]	100	[310]	100
	Contaminated	[172]	22.14	[45]	14.52
Post-FD	All Sample	[990]	100	[127]	100
	Contaminated	[245]	24.75	[24]	18.90
Diff. in Post- and Pre-Contamination Rates (Z statistic)			2.61 (1.28)		4.38 (1.14)

The whole sample consists of 1,767 downgrades and 437 upgrades of taxable corporate bonds issued by U.S. firms during the period of 52 months from August 1998 to December 2002 excluding October 2000. The sample is split equally into two 26-month periods: the pre-FD period from August 1998 to September 2000 and the post-FD period from November 2000 to December 2002. Categorical bond ratings are converted into a cardinal variable measured on a 23 point scale (1 for rating AAA, 23 for rating D). Different gradations of a major category (e.g. BB+, BB, and BB-) are treated separately and assigned different integer points. Size of rating changes is the cardinal value of new rating minus the cardinal value of old rating. The number of rating changes is indicated in square brackets.

Contaminated rating changes are identified by searching the Wall Street Journal Abstract using firm name. An observation is considered as contaminated if any firm-specific price-relevant information appears in the Wall Street Journal within a three-day window surrounding the event day of rating change. Z-statistic is used to test the difference in post- and pre- contamination rates.

**Table 3**

**Summary of Rating Changes by Absolute Magnitude of Rating Changes, Within Class, Across Class, and Across Investment Grade**

**Panel A: Sample distribution by absolute magnitude of rating changes<sup>a</sup>**

Absolute Magnitude of Rating Changes	Downgrades				Upgrades			
	Pre-FD		Post-FD		Pre-FD		Post-FD	
	#	%	#	%	#	%	#	%
1	458	58.94	550	55.56	251	80.97	100	78.74
2	206	26.51	277	27.98	39	12.58	15	11.81
3	67	8.62	108	10.91	15	4.84	9	7.09
4	28	3.60	41	4.14	2	0.65	1	0.79
5	6	0.77	6	0.61	2	0.65		
6	4	0.51	5	0.51				
7	4	0.51					2	1.57
8	1	0.13						
9	2	0.26	1	0.10	1	0.32		
10			1	0.10				
11	1	0.13	1	0.10				
<b>Total</b>	<b>777</b>	<b>100.00</b>	<b>990</b>	<b>100.00</b>	<b>310</b>	<b>100.00</b>	<b>127</b>	<b>100.00</b>

**Panel B: Sample distribution by within class, across class, and across investment grade<sup>b</sup>**

Rating Change	Downgrades				Upgrades			
	Pre-FD		Post-FD		Pre-FD		Post-FD	
	#	%	#	%	#	%	#	%
<b>Total</b>	<b>777</b>	<b>100.00</b>	<b>990</b>	<b>100.00</b>	<b>310</b>	<b>100.00</b>	<b>127</b>	<b>100.00</b>
Within class	345	44.40	446	45.05	186	60.00	73	57.48
Across class	432	55.60	544	54.95	124	40.00	54	42.52
Across invest.grade	78	10.04	112	11.31	41	13.23	18	14.17

The sample consists of 1,767 downgrades and 437 upgrades of taxable corporate bonds issued by U.S. firms during the period of 52 months from August 1998 to December 2002 excluding October 2000. The sample is split equally into two 26-month periods: the pre-FD period from August 1998 to September 2000 and the post-FD period from November 2000 to December 2002. Categorical bond ratings are converted into a cardinal variable measured on a 23 point scale (1 for rating AAA, 23 for rating D). Different gradations of a major category (e.g. BB+, BB, and BB-) are treated separately and assigned different integer points.

<sup>a</sup> Magnitude of rating changes is the cardinal value of new rating minus the cardinal value of old rating.

<sup>b</sup> Within or across class indicates whether the rating change occurs within gradations of the same letter class (e.g., BB+, BB, BB-) or across classes (e.g., AA- to A). Across investment grade indicates whether a bond is revised from investment grade to speculative grade or vice versa.

**Table 4**

**The Stock Price Response to Bond Downgrades and Upgrades for the Pre- and Post-FD Periods**

**Panel A: Raw CAR**

	Downgrades			Upgrades		
	Mean % CAR	Median % CAR	% of CAR<0 <u>All Observations</u>	Mean % CAR	Median % CAR	% of CAR>0
Pre-FD	-4.57 (-7.76)***	-2.41	64.74	-0.11 (-0.34)	-0.47	46.13
Post-FD	-6.93 (-10.79)***	-2.14	61.62	1.42 (2.68)***	0.63	56.69
Difference (Post – Pre)	-2.37 (-2.65)***	0.27 (1.10)	-3.12	1.53 (2.53)***	1.11 (2.51)***	10.56
	<u>Non-Contaminated Observations</u>					
Pre-FD	-3.06 (-5.52)***	-2.02	64.52	-0.22 (-0.70)	-0.49	46.27
Post-FD	-4.85 (-7.27)***	-1.38	58.27	1.17 (2.09)**	0.63	57.28
Difference (Post – Pre)	-1.79 (-2.06)**	0.64 (0.06)	-6.25	1.39 (2.24)**	1.12 (2.19)**	11.01

**Panel B: Standardized CAR**

	Downgrades			Upgrades		
	Mean % SCAR <sup>a</sup>	Median % SCAR	% of SCAR<0 <u>All Observations</u>	Mean % SCAR	Median % SCAR	% of SCAR>0
Pre-FD	-0.4039 (-7.87)***	-0.3203	64.74	-0.0039 (-0.07)	-0.0749	46.13
Post-FD	-0.7429 (-10.75)***	-0.3398	61.62	0.2432 (2.88)***	0.1257	56.69
Difference (Post – Pre)	-0.3390 (-3.94)***	-0.0195 (1.45)	-3.12	0.2471 (2.40)**	0.2006 (2.46)***	10.56
	<u>Non-Contaminated Observations</u>					
Pre-FD	-0.2857 (-5.91)***	-0.2581	64.52	-0.0141 (-0.25)	-0.0720	46.27
Post-FD	-0.4773 (-7.12)***	-0.2212	58.27	0.2102 (2.48)***	0.1257	57.28
Difference (Post – Pre)	-.1917 (-2.22)**	0.0369 (0.04)	-6.25	0.2243 (2.13)**	0.1977 (2.25)**	11.01

The whole sample consists of 1,767 downgrades and 437 upgrades of taxable corporate bonds issued by U.S. firms during the period of 52 months from August 1998 to December 2002 excluding October 2000. The sample is split equally into two 26-month periods: the pre-FD period from August 1998 to September 2000 and the post-FD period from November 2000 to December 2002. \*\*\* indicates 1% significance level.

Contaminated rating changes are identified by searching the Wall Street Journal Abstract using firm name. An observation is considered as contaminated if any firm-specific price-relevant information appears in the Wall Street Journal within a three-day window surrounding the event day of rating change.

CAR is cumulative abnormal return defined as stock return minus the contemporaneous return on the value-weighted market portfolio, calculated over the three-day event window (-1, +1), where day 0 is the effective date of a rating change. SCAR is the standardized cumulative abnormal return, defined as the ratio of CAR to its standard error calculated over the whole sample period August 1998 to December 2002. T-statistics are given in parentheses below the mean % CAR and SCAR. Mean and Median differences are tested using T, and Wilcoxon two-sample tests, respectively.

**Table 5**

**The Effect of FD on the Stock Price Response to Bond Downgrades and Upgrades**

$$SCAR_j = \alpha_0 + \alpha_1 RFD_j + \alpha_2 RCHANGE_j + \alpha_3 IGRADE_j + \alpha_4 DAYS_j + \varepsilon_j$$

Panel A: All Observations

Independent variables <sup>a</sup>	Downgrades		Upgrades	
	Expected sign	Coefficients (t-stat.)	Expected sign	Coefficients (t-stat.)
INTERCEPT		-0.1232 (-0.79)		0.0529 (0.29)
RFD	-	-0.3112 (-3.51)***	+	0.2510 (2.41)**
RCHANGE	-	-0.2743 (-6.42)***	+	-0.0311 (-0.54)
IGRADE	-	-0.4764 (-3.32)***	+	-0.1053 (-0.74)
DAYS	+/-	0.0467 (2.16)**	+/-	-0.0005 (-0.02)
Adj. R <sup>2</sup> (%)		4.78		0.64
F-stat.		23.16***		1.70
No. of obs.		1767		437

Panel B: Non-Contaminated Observations

Independent variables <sup>a</sup>	Downgrades		Upgrades	
	Expected sign	Coefficients (t-stat.)	Expected sign	Coefficients (t-stat.)
INTERCEPT		-0.0068 (-0.04)		0.0358 (0.20)
RFD	-	-0.1675 (-1.99)**	+	0.2269 (2.12)**
RCHANGE	-	-0.2404 (-5.59)***	+	-0.0348 (-0.62)
IGRADE	-	-0.2477 (-1.78)*	+	-0.0732 (-0.49)
DAYS	+/-	0.0289 (1.36)	+/-	-0.0010 (-0.04)
Adj. R <sup>2</sup> (%)		3.43		0.33
F-stat.		12.98***		0.53
No. of obs.		1350		368

The whole sample consists of 1,767 downgrades and 437 upgrades of taxable corporate bonds issued by U.S. firms during the period of 52 months from August 1998 to December 2002 excluding October 2000. The sample is split equally into two 26-month periods: the pre-FD period from August 1998 to September 2000 and the post-FD period from November 2000 to December 2002. \*\*\* and \*\* indicate significance better than the 1%, and 5% two-tailed levels, respectively.

Contaminated rating changes are identified by searching the Wall Street Journal Abstract using firm name. An observation is considered as contaminated if any firm-specific price-relevant information appears in the Wall Street Journal within a three-day window surrounding the event day of rating change.

<sup>a</sup> Variable definitions: SCAR is the standardized cumulative abnormal return, defined as the ratio of CAR to its standard error calculated over the whole sample period August 1998 to December 2002, where CAR is cumulative abnormal return (daily stock return minus the contemporaneous return on the value-weighted market portfolio) over the three-day event window (-1, +1); RFD is a Regulation FD dummy variable, equal to one if an observation is from the post-FD period, and zero otherwise; RCHANGE is the absolute magnitude of the rating change, where categorical bond ratings are converted into a cardinal variable measured on a 23 point scale (1 for rating AAA, 23 for rating D); IGRADE is a dummy variable set equal to one if a bond is revised from investment grade to speculative grade or vice versa, and zero otherwise; DAYS is the natural log of the number of days between two consecutive rating changes of the same bond in the same direction, and the number of days is set equal to 1200 if there are no bond revisions in the same direction in the sample period.

**Table 6**

**Business Cycle and the Stock Price Response to Bond Downgrades and Upgrades  
All Observations: November 2000-December 2002**

$$SCAR_j = \alpha_0 + \alpha_1 BCYCLE_j + \alpha_2 RCHANGE_j + \alpha_3 IGRADE_j + \alpha_4 DAYS_j + \varepsilon_j$$

Independent variables <sup>a</sup>	Downgrades		Upgrades	
	Expected sign	Coeff. (t-stat.)	Expected sign	Coeff. (t-stat.)
INTERCEPT		-0.4323 (-2.57)**		0.9074 (3.13)***
BCYCLE		0.5254 (3.82)***		-0.2473 (-1.22)
RCHANGE	-	-0.3439 (-5.10)***	+	-0.1673 (-1.80)*
IGRADE	-	-0.6195 (-2.86)***	+	0.0354 (0.14)
DAYS	+/-	0.0001 (0.65)	+/-	-0.0003 (-1.76)*
Adj. R <sup>2</sup> (%)		5.25		2.18
F-stat.		14.71***		1.70
No. of obs.		990		127

The whole sample consists of 990 downgrades and 127 upgrades of taxable corporate bonds issued by U.S. firms during the post-FD period of 26 months from November 2000 to December 2002. \*\*\*, \*\*, and \* indicate significance better than the 1%, 5%, and 10% two-tailed levels, respectively.

<sup>a</sup> Variable definitions: SCAR is the standardized cumulative abnormal return, defined as the ratio of CAR to its standard error calculated over the whole sample period August 1998 to December 2002, where CAR is cumulative abnormal return (daily stock return minus the contemporaneous return on the value-weighted market portfolio) over the three-day event window (-1, +1); BCYCLE is a dummy variable, equal to one if an observation is from the period of November 2000 to November 2001, and zero otherwise; RCHANGE is the absolute magnitude of the rating change, where categorical bond ratings are converted into a cardinal variable measured on a 23 point scale (1 for rating AAA, 23 for rating D); IGRADE is a dummy variable set equal to one if a bond is revised downgraded from investment grade to non-investment grade or upgraded from non-investment to investment grade, and zero otherwise; DAYS is the natural log of the number of days between two consecutive rating changes of the same bond in the same direction, and the number of days is set equal to 1200 if there are no bond revisions in the same direction in the sample period.

**Table 7**

**The Effect of FD on the Stock Price Response to Bond Downgrades and Upgrades:  
Large Firm vs. Small Firm**

$$SCAR_j = \alpha_0^L SIZEL_j + \alpha_0^S SIZES_j + \alpha_1 RFD * SIZEL_j + \alpha_2 RFD * SIZES_j + \alpha_3 RCHANGE_j + \alpha_4 IGRADE_j + \alpha_5 DAYS_j + \varepsilon_j$$

Independent variables <sup>a</sup>	Downgrades		Upgrades	
	Expected sign	Coefficients (t-stat.)	Expected sign	Coefficients (t-stat.)
SIZEL		0.0477 (0.26)		-0.0084 (-0.05)
SIZES		-0.2232 (-1.35)		0.1143 (0.60)
RFD*SIZEL	-	-0.5134 (-3.57)***	+	0.4688 (2.84)***
RFD*SIZES	-	-0.2103 (-1.79)	+	0.1057 (0.79)
RCHANGE	-	-0.2651 (-6.14)***	+	-0.0288 (-0.50)
IGRADE	-	-0.4773 (-3.31)***	+	-0.1260 (-0.88)
DAYS	+/-	0.0469 (2.17)**	+/-	-0.0016 (-0.06)
Adj. R <sup>2</sup> (%)		13.37		2.69
F-stat.		39.95***		1.70
No. of obs.		1767		437

The whole sample consists of 1,767 downgrades and 437 upgrades of taxable corporate bonds issued by U.S. firms during the period of 52 months from August 1998 to December 2002 excluding October 2000. The sample is split equally into two 26-month periods: the pre-FD period from August 1998 to September 2000 and the post-FD period from November 2000 to December 2002. \*\*\* and \*\* indicate significance better than the 1%, and 5% two-tailed levels, respectively.

<sup>a</sup> Variable definitions: SCAR is the standardized cumulative abnormal return, defined as the ratio of CAR to its standard error calculated over the whole sample period August 1998 to December 2002, where CAR is cumulative abnormal return (daily stock return minus the contemporaneous return on the value-weighted market portfolio) over the three-day event window (-1, +1); RFD is a FD dummy variable, equal to one if an observation is from the post-FD period, and zero otherwise; SIZEL (SIZES) is a large (small) firm size dummy variable, set equal to one if a bond issuer's market value of equity at the end of fiscal year 1999 is greater (less) than the sample median of the variable, and zero otherwise; RCHANGE is the absolute magnitude of the rating change, where categorical bond ratings are converted into a cardinal variable measured on a 23 point scale (1 for rating AAA, 23 for rating D); IGRADE is a dummy variable set equal to one if a bond is revised from investment grade to speculative grade or vice versa, and zero otherwise; DAYS is the natural log of the number of days between two consecutive rating changes of the same bond in the same direction, and the number of days is set equal to 1200 if there are no bond revisions in the same direction in the sample period.

**Table 8**

**The Effect of Reg-FD on the Stock Price Response to Bond Downgrades and Upgrades:  
Large vs. Small Number of Analyst Following**

$$SCAR_j = \alpha_0^L AFL_j + \alpha_0^S AFS_j + \alpha_1 RFD * AFL_j + \alpha_2 RFD * AFS_j + \alpha_3 RCHANGE_j + \alpha_4 IGRADE_j + \alpha_5 DAYS_j + \varepsilon_j$$

Independent variables <sup>a</sup>	Downgrades		Upgrades	
	Expected sign	Coefficients (t-stat.)	Expected sign	Coefficients (t-stat.)
AFL		0.0039 (0.02)		-0.0051 (-0.03)
AFS		-0.1895 (-1.14)		0.1408 (0.73)
RFD*AFL	-	-0.5182 (-3.71)***	+	0.5151 (3.20)***
RFD*AFS	-	-0.1652 (-1.42)	+	0.0601 (0.44)
RCHANGE	-	-0.2709 (-6.31)***	+	-0.0280 (-0.48)
IGRADE	-	-0.4718 (-3.28)***	+	-0.1296 (-0.91)
DAYS	+/-	0.0449 (2.08)**	+/-	-0.0037 (-0.14)
Adj. R <sup>2</sup> (%)		13.37		3.08
F-stat.		39.98***		1.95*
No. of obs.		1767		437

The whole sample consists of 1,767 downgrades and 437 upgrades of taxable corporate bonds issued by U.S. firms during the period of 52 months from August 1998 to December 2002 excluding October 2000. The sample is split equally into two 26-month periods: the pre-FD period from August 1998 to September 2000 and the post-FD period from November 2000 to December 2002. \*\*\* and \*\* indicate significance better than the 1%, and 5% two-tailed levels, respectively.

<sup>a</sup> Variable definitions: SCAR is the standardized cumulative abnormal return, defined as the ratio of CAR to its standard error calculated over the whole sample period August 1998 to December 2002, where CAR is cumulative abnormal return (daily stock return minus the contemporaneous return on the value-weighted market portfolio) over the three-day event window (-1, +1); RFD is a FD dummy variable, equal to one if an observation is from the post-FD period, and zero otherwise; AFL (AFS) is a large (small) analyst following dummy variable set equal to one if a bond issuer has the number of stock analysts following it at the end of fiscal year 1999 greater (less) than the sample median of the variable, and zero otherwise; RCHANGE is the absolute magnitude of the rating change, where categorical bond ratings are converted into a cardinal variable measured on a 23 point scale (1 for rating AAA, 23 for rating D); IGRADE is a dummy variable set equal to one if a bond is revised from investment grade to speculative grade or vice versa, and zero otherwise; DAYS is the natural log of the number of days between two consecutive rating changes of the same bond in the same direction, and the number of days is set equal to 1200 if there are no bond revisions in the same direction in the sample period.