Analyst Recommendations Respond More Symmetrically to Major News after Regulation FD and the Global Settlement: A Replication and Extension of Conrad, Cornell, Landsman, and Rountree (2006)

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Abstract

This paper confirms Conrad et al.'s (2006) pre-2000 evidence that analysts are more likely to revise recommendations after major news and downgrade more often than upgrade their recommendations following major negative news. Regulation FD in 2000 and the Global Settlement in 2003 reshaped analysts' information environment. Regulation FD curtails private information channels between analysts and firm managers. The Global Settlement boosts analyst independence and curbs conflicts of interest through enhanced disclosures regarding analysts' ratings and the mandated separation of brokerage firms' research and investment banking activities. Extending Conrad et al.'s (2006) work, this paper shows that analysts react to major news through recommendation revisions as if they have private information even under Regulation FD. However, analysts' recommendations respond more symmetrically to major news after Regulation FD and the Global Settlement, which supports that these regulatory efforts make analysts more unbiased in releasing their private information following major news.

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I. Introduction

Analysts' information environment changed drastically in the early 2000s after a series of regulatory events, such as Regulation FD in 2000 and the Global Settlement in 2003. The effect of these regulations on analysts' information production activities and their relationships with firm managers have interested investors, regulators, and researchers (Chen and Chen 2009; Kadan et al. 2009; Koch et al. 2013; Kothari et al. 2016; Palmon and Yezegel 2011; Wu et al. 2017).[1] This paper revisits the issue "How Do Analyst Recommendations Respond to Major News?" by Conrad, Cornell, Landsman, and Rountree (CCLR) (2006) by questioning how these regulatory efforts might affect analysts' information production following public information events. This paper replicates and extends CCLR's (2006) work to determine whether their results still hold in the reshaped reporting environment.

CCLR examine how analysts' recommendations change in response to major news from 1993 to 2000 and find that analysts change their recommendations following large stock price movements as if they have private information after major news hits the market. In addition, analysts do not revise their recommendations symmetrically following negative information shocks as they do after positive shocks. While analysts are equally likely to upgrade or downgrade their recommendations following large stock price increases, they are more likely to downgrade a firm's stock following large stock price declines. CCLR attribute this asymmetric response to potential conflicts of interest that make analysts more likely to downgrade and release their negative private information after negative return events.[2] CCLR's pre-2000 evidence supports the

[1] A series of regulatory actions and reforms regarding the issue of analysts' conflicts of interest took place before the Global Settlement in April 2003. In June 2001, the US Congress commenced hearings into analysts' behavior, and the New York State Attorney General (NYAG) initiated investigations regarding the conflicts of interest between the investment banking and research divisions at Merrill Lynch. In February 2002, the National Association of Securities Dealers (NASD) submitted its proposed Rule 2711 to the Securities and Exchange Commission (SEC), which approved the proposed rule in May 2002 when a similar amendment to the New York Stock Exchange (NYSE) Rule 472 was also approved. These rules took effect in July 2002 and govern analysts' conflicts of interest by restricting interactions between investment firms' investment banking and research divisions, proscribing promises of favorable research, and requiring enhanced disclosures of conflicts of interest and the distribution of recommendations issued. In September 2002, these "Self-Regulatory Organizations" (SRO) Rules became effective and affected virtually all brokerage firms. The Global Settlement, which aims to resolve issues of conflicts of interest, was reached in December 2002 and completed in April 2003. In the 2003 Global Settlement, ten large, sanctioned investment firms, including Bear Stearns, Credit Suisse First Boston, Goldman Sachs, Lehman Brothers, J.P. Morgan, Merrill Lynch, Morgan Stanley, Salomon Smith Barney, UBS Warburg, and Piper Jaffray, agreed to pay approximately $900 million disgorgement and civil penalties to settle with the SEC, NASD, NYSE, and NYAG and to pay about $450 million to procure independent research for five years (SEC 2003). See Wu et al. (2017) and Tseng and Wilson (2020) for detail discussions of the institutional background. This paper broadly separates the time periods by the year 2000.

[2] According to CCLR, analysts without conflicts of interest release their private information in an unbiased way, resulting in symmetrically downgrade revisions following positive return events and upgrade revisions following

idea that analysts act as if they have private information and respond to major news through recommendation changes that are asymmetrical and conditional on the sign of the news.

Analysts' information environment changed with several regulatory reforms in the early 2000s, which could affect analysts' information production and conflicts of interest. Thus, this paper investigates whether CCLR's results still hold after these regulations.

Regulation FD prohibits firms' selective disclosures of material non-public information and limits analysts' private information obtained from firm managers, but its impact on analysts' private information production is unclear (Koch et al. 2013; Palmon and Yezegel 2011). Escalating costs of analysts' services due to curbed private communication between analysts and managers under Regulation FD may hamper analysts' private information production (Kothari et al. 2016). If firms fully and fairly disclose all material information that can trigger large price changes and improve information efficiency under Regulation FD, analysts may have little private information to convey through recommendations after the market incorporates the major public news (Gintschel and Markov 2004; Cornett et al. 2007; Palmon and Yezegel 2011).[3] Besides, the overall informativeness of recommendations decreases after brokerage firms' rating schemes became coarser around the 2003 Global Settlement (Kadan et al. 2009). The change in rating schemes from five levels to three levels may reflect that analysts can convey less detailed information through their recommendations in a more stringently regulated information environment.[4] If analysts have limited information advantages relative to the informationally efficient market after these regulations, major stock movements will leave the probability of analysts' recommendation changes unaffected (Conrad et al. 2006).

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negative news. On the other hand, analysts with conflicts of interest may be pressured not to release negative private information before major news arrives, but they are relieved of that business pressure and can release their negative private information following major negative return events. In this case, recommendation downgrades would be more likely to occur after negative news hits the market.

[3] After Regulation FD, Gintschel and Markov (2004) find decreased informativeness of stock recommendations, measured as return volatility surrounding analysts' recommendation announcements, Cornett et al. (2007) find decreased market reactions to recommendation changes, and Palmon and Yezegel (2011) find decreased predictive value of stock recommendations for upcoming earnings surprises. These studies support a decrease in the information value of analysts' recommendations under Regulation FD. However, the focus of this paper is on analysts' private information releases via recommendations following major news on the market.

[4] This paper uses IBES standardized 5-level recommendation ratings throughout the analyses to be consistent with CCLR (2006). While analysts widely transition to 3-level rating schemes after 2003 for their public disclosures, they can determine how their recommendation scale maps to the IBES 5-level rating scheme, with negative to negative ratings, positive to positive ratings and neutral to neutral ratings (Tomson Financial 2008). This explains why 5-level recommendations are still shown in the IBES database after 2000. Both this paper and CCLR (2006) look at recommendation changes, and using recommendation revisions facilitates analyses across different rating schemes.

On the other hand, some research supports the idea that analysts devote greater effort to producing private information to signal their skill and distinguish themselves from other analysts using firms' disclosures "fairly" made for all market participants. Increased heterogeneous beliefs, decreased firm coverage, and longer delays in issuing forecasts after Regulation FD support the increased effort argument (Koch et al. 2013). Even under Regulation FD, analysts can also produce private information by solving puzzles comprised of firms' selective disclosures of non-material information (Green et al. 2014). Both the argument of higher effort and the puzzle-solving "mosaic theory" would predict CCLR's finding that analysts' recommendation changes following stock price changes persist and support that these analysts perceive themselves to possess private information even after the 2000s.

With the regulatory reforms that aim to alleviate analysts' conflicts of interest in the 2000s, it is unclear whether CCLR's finding of analysts' asymmetric recommendation changes following stock price changes would hold. If these regulations work, analysts' conflicts of interest can be curtailed by the mandated separation of research and investment banking and the enhanced disclosure requirements related to the definition and distribution of stock ratings. Prior literature supports increased analyst independence and reduced optimism in analysts' recommendations after the Global Settlement and related regulations like NASD Rule 2711 and NYSE Rule 472 (Barber et al. 2006; Kadan et al. 2009; Chen and Chen 2009; Kothari et al. 2016; Wu et al. 2017; Tseng and Wilson 2020). In the mergers and acquisitions (M&A) advisory setting, Wu et al. (2017) show that the difference in recommendation optimism between affiliated and unaffiliated analysts was reduced after the Global Settlement and related regulations to the point that no significant difference remained. With the mitigation of analysts' conflicts of interest that would drive analysts' reluctance to downgrade recommendations, analysts might revise their recommendations more symmetrically regardless of the sign of price shocks (Conrad et al. 2006).

However, if analysts' conflicts of interest are still present after the 2000s, CCLR's finding of further downgrades after negative shocks would persist. The series of regulatory efforts may mitigate analysts' conflicts of interest, but might not eliminate them (Barber et al. 2006; Kadan et al. 2009; Corwin et al. 2017).[5] Corwin et al. (2017) document the reduction of analysts' affiliation

[5] Based on IBES data from 2000 to 2004, Kadan et al. (2009) find that sanctioned brokerage firms are more likely to issue pessimistic recommendations and less likely to issue optimistic ones in the post-Regulation FD setting. However, Kadan et al. (2009) also find that the brokerage firms affiliated with clients in IPOs or SEOs are still less likely to issue pessimistic recommendations than non-affiliated brokerage firms after enactment of the Global Settlement and

bias at large brokerage firms sanctioned under the Global Settlement, but little reduction in affiliation bias at non-sanctioned firms after the Settlement. In addition, regulatory scrutiny may not always be as tight as intended. While NASD Rule 2711 and NYSE Rule 472 apply to virtually all brokerage firms, the Global Settlement applies only to the sanctioned large brokerage firms (Kadan et al. 2009; Corwin et al. 2017). In the Global Settlement, large brokerage firms promised to fund and publish independent research for five years. These promises simply "expired." Some requirements in the 2003 Global Settlement have subsequently been softened (Wu et al. 2017). In 2009, the Federal Court approved amendments to the Global Settlement, which conditionally allow analysts to communicate with investment bankers during the due diligence process. These modifications might suggest that CCLR's finding of analysts' asymmetrical changes to their recommendations following negative information shocks would continue to hold given analysts' potentially enduring conflicts of interest.[6]

Whether CCLR's findings are replicable in the pre-2000 setting and extensible in the post-2000 setting is an empirical question. Our results support that CCLR's published results are highly replicable. Despite retrospective database changes (Ljungqvist et al. 2009), the inferences of CCLR's pre-2000 findings are robust years later.[7] Consistent with CCLR, the pre-2000 results indicate that large price movements can predict analysts' recommendation changes and that an asymmetry exists between the recommendation changes after positive and negative return events. Our results reaffirm CCLR's finding that analysts experienced conflicts of interest in their private information production before the 2000s.

On the other hand, the extension results in the post-2000 setting are interestingly mixed. While analysts still respond to large price movements as if they believe that they have private information, they are equally likely to make upgrades or downgrades following large price increases or decreases. After the 2000s, analysts' recommendation changes are less sticky for downgrading after the arrival of negative news. The asymmetry between the recommendation

related regulations. Based on IBES data from 1993 to 2014 (excluding 2002 and 2003), Tseng and Wilson (2020) find a reduction in recommendation optimism for brokerage firms that switch to coarser rating systems after the Global Settlement. Among brokerage firms that change their rating systems, Tseng and Wilson (2020) show that optimism reduction is more pronounced for affiliated brokerage firms than non-affiliated firms.

[6] CCLR (2006) offer information cascading as an alternative explanation for analysts' asymmetric recommendation response following negative return events. If CCLR's finding of asymmetric responses is mainly explained by information cascading rather than conflicts of interest, this paper also expects that the asymmetric response would be present since the Global Settlement aims to resolve analysts' conflicts of interest and is expected to have neutral effects on analysts' information cascading.

[7] A limitation of this paper is an inability to rule out potential effects of database changes on our post-2000 findings.

changes after positive and negative return events becomes weaker after the 2000s, supporting the idea that analysts' private information production is less subject to conflicts of interest in the reporting environment after Regulation FD and the Global Settlement. Also, analysts affiliated with firms through M&A, debt, or equity financing activities are less likely to make favorable ratings without positive news to support their opinion about the client firms. Thus, CCLR's first finding of analysts' private information production following public information events holds, but their finding related to analysts' conflicts of interest appears to change after the 2000s.

This paper contributes to the replicability of published papers on financial analysts (Brown 2013; Denison et al. 2014; Dyckman and Zeff 2014; Dyckman and Zeff 2015; Dyckman and Zeff 2019; Hail et al. 2020; Hermanson 2018; Schipper 1994; Zeff 2019). The replication reaffirms the robustness and enhances the credibility of CCLR's findings. This paper also contributes to the increased generalizability of CCLR's finding of analysts' private information production by extending their previous findings to the updated business environment. The evidence about the change in analysts' asymmetric response to major news before and after 2000 is relevant to regulators when evaluating the joint effectiveness of several regulations in the early 2000s from a long-term perspective (Koch et al. 2013; Kothari et al. 2016; Wu et al. 2017; Tseng and Wilson 2020). The paper provides new evidence regarding how analysts react to major news. For papers citing CCLR's work, this paper provides a foundation for assuming that analysts' private information production is present over time, but highlights the notable change in analysts' conflicts of interest in the reshaped reporting environment.

This paper follows CCLR's organization to facilitate comparing the two studies and proceeds as follows: Section II outlines the empirical work. Section III and IV show and discuss the results. Section V performs additional tests, and Section VI concludes.

II. Empirical Work

A. Samples for Replicating and Extending CCLR

Within the full sample period from 1993 to 2019, the replication (extension) sample spans from 1993 to 2000 (2001 to 2019) for US firms.[8] Analysts' stock recommendations come from the

[8] IBES started its large-scale recommendation data collection in 1993. The data analysis in this paper was done in 2020, so the sample period ends in 2019, and the analysis is based on data for each complete year to avoid potential over-conclusions for 2020 before its complete data becomes available. It makes sense to reexamine CCLR's

IBES database. Following CCLR, this paper uses recommendation observations issued by a particular brokerage house for a specific firm. Thus, there is no distinction in the sample between analyst recommendations and brokerage firm recommendations. The replication (full) sample from 1993 to 2000 (1993 to 2019) includes a total of 222,961 (761,357) recommendation observations in the IBES file and 83,710 (218,165) initializations that represent the first observation for a particular broker-firm combination in the data set.

For each available broker-firm combination, daily recommendations are constructed from the IBES dataset using the same "filling in the holes" approach used by CCLR. The recommendation is assumed to remain unchanged if a brokerage issues no new recommendation on a given day for a given firm. Consistent with CCLR, unchanged recommendations represent the overwhelming majority of the observations.

With large stock price changes proxying for significant information events, this study follows CCLR to construct a vector based on three-day compound returns for each firm based on each day in the period when a firm is covered by at least one brokerage firm. Firm i's three-day returns preceding day t, r_{it}, are netted against the contemporaneous three-day value-weighted market returns, r_{mt}, and standardized by the standard deviation of the firm's adjusted returns, $\sigma_{it}(r_{it} - r_{mt})$. A vector of market-adjusted returns, $ADJRET3_{it}$, is computed as the ratio $[r_{it} - r_{mt}]/\sigma_{it}(r_{it} - r_{mt})$.

The sample of market-adjusted returns is used to calculate the upper and lower 1% tail cutoff points of the distribution of normalized three-day returns aggregated across all firms. Firms experiencing extreme stock return changes are considered to have a significant public information event. The resulting upper and lower 1% cutoff points for the $ADJRET3_{it}$ distribution in the replication (extension) sample are -2.59 (-2.68) and 3.13 (3.01).[9] The sample of extreme 1% return events is selected for each firm by comparing the market-adjusted three-day returns to the cutoff points obtained from the replication and extension samples. Appendix A tabulates the 1% tails of

hypotheses in all available years after 2000 in case firms gradually change their reporting behaviors under Regulation FD and the Global Settlement (Koch et al. 2013).

[9] CCLR report the lower (upper) 1% cutoff values as -2.59 and 3.06. The difference between their values and ours may occur because our paper allows the end dates for each firm followed by at least one brokerage firms to fall beyond 2000. Also, IBES sometimes retrospectively changes its recommendations data, such as the 2008 removal of recommendations by Lehman Brothers. These changes could explain the differences in sample size, variable distributions, or applicable cutoff values, even though this paper follows the sample criteria specified by CCLR. This paper expects CCLR's findings to be robust as long as their results continue to reflect the underlying economic mechanism.

the return distributions. Following CCLR, this paper also avoids selecting overlapping returns as extreme events. Once a three-day period is flagged as an extreme return event, the next two three-day return events will not be selected.

[Appendix A here]

The procedure to select return events is repeated for each firm in the IBES sample, and the results include 55,577 (123,561) positive return events and 53,665 (119,510) negative return events in the replication (extension) sample. Both samples cover a larger number of extremely positive return events, reflecting the fact that extremely negative return events are associated with more overlapping returns that are eliminated in the selection procedure. Therefore, the 1% sample for the replication (extension) sample will be based on the 109,242 (243,071) extreme return events.

Following CCLR, this paper constructs the probit samples for both the replication and extension samples by extending from 20 days before the return event to 20 days after the return event, centered on the day following the last day of the 1% three-day return event. Thus, the probit samples include the dates in the 41-day event window around the date after extreme information shocks. As in footnote 10 in CCLR, this paper removes duplicate entries and leaves a single observation for each brokerage-firm-day observation in the probit samples. Using the probit samples with identified information events and their surrounding days in the ± 20 days window, this paper analyzes how recommendation levels and the probability of changing recommendations are related to variables that are publicly available as of the previous day.

B. Univariate Analysis

Tables 1 and 2 present the frequency of recommendation changes and levels. In Table 1, results for the replication samples in Panel A are comparable to those in CCLR. Results for the extended samples in Panel B also shows that "No Changes" dominates all samples.

[Table 1 here]

Table 2 indicates that downgrades are more frequent than upgrades in both the replication and extension periods. Panels A and B of Table 2 show that analysts' activity in changing

recommendations is much greater following large return events. For the 1% sample, the frequency of upgrades (downgrades) is three times (more than four times) higher compared to the probit sample. These observations are consistent with CCLR's results and their finding that analysts behave as if they possess private information.

[Table 2 here]

Table 3 partitions the 1% samples based on the sign of standardized returns for the replication and extension samples and includes the summary statistics for the returns. Panel A of Table 3 reveals approximately equal numbers of upgrades and downgrades following positive information shocks, but the number of downgrades is more than three times that of upgrades for negative information shocks. These results are consistent with CCLR's findings. Based on the extension sample, Panel B shows slightly more downgrades than upgrades following positive information shocks.

[Table 3 here]

The pattern of prevalent downgrades following negative information shocks for the probit samples in Table 4 is similar to the pattern for the 1% samples in Table 3. Although the number of downgrades is still more than the number of upgrades after negative return events, the proportion of the asymmetric numbers of downgrades following negative news after the 2000s decreases slightly compared to the period before the 2000s.

[Table 4 here]

Panels A1 and A2 (B1 and B2) of Table 5 show transition matrices of the probability of moving from one recommendation rating to another for the 1% and probit samples from 1993 to 2000 (2001 to 2019). This study calculates average daily recommendation changes as done by CCLR. In the 1% sample for the replication period, the average daily recommendation change after negative information shocks is 0.022, but 0.001 after positive shocks. There is virtually no asymmetry in analysts' responses in the probit sample for the replication period, which supports

the idea that the unconditional probability of an analyst recommendation change is essentially zero. Panels A1 and A2 replicate CCLR's findings and confirm the results of the asymmetry in analysts' responses in the pre-2000 setting. In the post-2000 setting, Panel B1 (B2) of Table 5 shows an average recommendation decrease (increase) to 0.007 (0.004) in the 1% sample after negative (positive) return shocks. That is, the extent of analysts' asymmetric responses shrinks. Furthermore, virtually no asymmetry in analysts' responses is found in the probit sample after the 2000s.

[Table 5 here]

C. Multivariate Analysis

The probit samples include the observations ± 20 trading days surrounding event dates following a standardized three-day market-adjusted return within the 1% tails of the distribution for sample firms. This paper runs Model (1) with the ordered probit model to fit the discrete categorical feature of recommendation data.

$$\begin{aligned} REC_{ijt} = {} & \alpha_0 + \alpha_1 ADJRET3_{it} + \alpha_2 NEGRET_{it} \\ & + \alpha_3 NEGRET_{it} \times ADJRET3_{it} + \alpha_4 ADJRET10_{it} + \alpha_5 AFIL_{ij} \\ & + \alpha_6 AFIL_{ij} \times ADJRET3_{it} + \alpha_7 AFIL_{ij} \times ADJRET10_{it} \\ & + \alpha_8 LMNREC3_{it} + \alpha_9 LMNREC10_{it} + \alpha_{10} NUMREC_{it} \\ & + \alpha_{11} LPERC3_{it} + \alpha_{12} LPERC10_{it} + \alpha_{13} AGE_i \\ & + \alpha_{14} MVE_{it} + \alpha_{15} PRICE_{it} + \alpha_{16} SMALL_{it} \\ & + \alpha_{17} SMALL_{it} \times ADJRET3_{it} + \varepsilon_{ijt} \end{aligned} \quad (1)$$

Model (1) regresses the recommendation level, REC_{ijt}, on a vector of regressors, including preceding news shocks ($ADJRET3_{it}$ and $ADJRET10_{it}$), the sign of news shocks ($NEGRET_{it}$), investment banking relationships ($AFIL_{ij}$), the indicator of the smallest size decile ($SMALL_i$), the mean recommendation changes ($LMNREC3_{it}$ and $LMNREC10_{it}$), the percentage of recommendation changes ($LPERC3_{it}$ and $LPERC10_{it}$), stock prices ($PRICE_{it}$), and several proxies for the amount of public information, such as the number of analysts following the firm ($NUMREC_{it}$), firm size (MVE_{it}), and firm age (AGE_i). This paper defines and constructs the variables as done by CCLR. Variable definitions are in Appendix B.

[Appendix B here]

Model (1) is estimated by pooling observations across firms and analysts during the ± 20 day window surrounding the large stock return event, but is estimated separately for each initial or starting recommendation level, $LREC$, which is affirmed or revised to the new recommendation level, REC_{ijt}, for firm i by analyst j on day t.

D. Data

Table 6 presents the summary statistics for all variables used in the probit analysis. The summary statistics for the replication sample in Panels A1 and A2 are comparable with those reported by CCLR.[10] In Panel B1 of Table 6, the mean firm in the extension sample is about 23 years old, has a price of $50, and has approximately $12.5 billion of equity outstanding. These values make sense since firms get older but tend to grow over time. On average, 38% of sample firms are affiliated with the brokerage houses employing the analyst who makes recommendations. On average, ten analysts cover each firm. In the last three (10) days before any given day in the probit samples, 1% (3%) of other analysts covering the firm have changed their recommendation levels. The mean recommendation changes are near zero in both the three-day and 10-day periods before each analyst's recommendation changes, implying that analysts seldom change their recommendations. In Panels A2 and B2, the mean standardized 10-day returns preceding the three-day returns support price reversals for the positive return events, as shown by CCLR (2006).

[Table 6 here]

III. Probit Results

Based on the replication sample from 1993 to 2000, Table 7 presents the ordered probit results for Model (1). The first question is whether analysts act as if they have private information

[10] A notable exception is the indicator for affiliated firms. In this paper, 26% of the sample firms are affiliated with the analysts making recommendations (mean = 0.26; standard deviation = 0.44), whereas only 3% of CCLR's sample firms are affiliated (mean = 0.03; standard deviation = 15.72). According to Tseng and Wilson's (2020) sample statistics reported in their Table 2: 5.8% (5.5%) of firms are affiliated with analysts through M&A activities, 39.7% (47.8%) through IPO activities, and 32.2% (34.8%) through SEO activities before (after) 2002/2003. Since CCLR adopt a broad definition for firms being affiliated, their reported 3% proportion of affiliated firms is surprisingly low. Although our matching method is neither perfect nor complete, our statistics seem more reasonable and consistent with those from Tseng and Wilson (2020), which are also based on IBES and SDC files.

and respond to large price shocks. The coefficient on a key variable of interest, $ADJRET3_{it}$, is 0.018 and significant, indicating that analysts tend to downgrade recommendations following positive return events. The coefficient on $NEGRET_{it} \times ADJRET3_{it}$ is significantly negative, indicating that analysts also systematically respond to negative price events. The second question is whether analysts react symmetrically to both positive and negative information events. The total coefficient on negative return events, $ADJRET3_{it} + NEGRET_{it} \times ADJRET3_{it}$, is -0.038 and significant. On average, analysts systematically react more strongly to negative news than to positive news. The result of a strong response to negative events is robust even after focusing on interior recommendations, which are recommendations revised from the rating levels 2, 3, and 4. The asymmetric responses to positive and negative return events are consistent with CCLR's argument that analysts face conflicts of interest that make them withhold negative private information until the arrival of negative public news. When negative public news arrives, analysts are more likely to feel relieved of their business pressure and can offer recommendation downgrades. Panel B of Table 7 indicates that the asymmetric responses are primarily driven by observations that downgrade from strong buy or buy ratings.

Regarding other variables, the coefficient on $AFIL_{ij}$ is -0.029 and significant, indicating that affiliated analysts are more likely to give more favorable ratings. The coefficients on $LMNREC3_{it}$ and $LMNREC10_{it}$ are significantly positive, which supports the idea that the probability of downgrading (upgrading) a firm is higher when other analysts downgrade (upgrade) the firm in the days preceding information events. Consistent with CCLR, this paper shows positive coefficients on AGE_i and $SMALL_{it}$ and negative coefficients on $PRICE_{it}$ and $SMALL_{it} \times ADJRET3_{it}$. Overall, the replicated results are consistent with CCLR's findings that analysts act as if they possess private information and downgrade their recommendations more strongly after negative return events than after positive events. The replication results reaffirm the concern about analysts' conflicts of interest in their private information production before the 2000s.

[Table 7 here]

Based on the sample from 2001 to 2019, Table 8 presents the extension results for the ordered probit model. The coefficient on $ADJRET3_{it}$ is 0.029 and significant, suggesting that analysts continue to act as if they have private information following public information events.

Despite curtailed channels for analysts to obtain private information from firm managers under Regulation FD, analysts still convey their perceived private information following major public news. Analysts also respond to negative information events since the coefficient on $NEGRET_{it} \times ADJRET3_{it}$ is significantly negative. However, the coefficient on the total effect, $ADJRET3_{it} + NEGRET_{it} \times ADJRET3_{it}$, is negative, but no longer significant. On average, analysts do not systematically react more strongly to negative news than to positive news after the 2000s. In fact, the previous finding of analysts' responding in a strongly asymmetrical way to negative events disappears when focusing on interior recommendations.

Panel B of Table 8 indicates that the disappearing asymmetric responses could be driven by the distribution shift of analysts giving less optimistic recommendations across different ratings (Kadan et al. 2009) and by their decreased (increased) reactions to negative news shocks when they revise strong buy or buy (other) ratings. These results support the effectiveness of regulatory efforts in mitigating analysts' conflicts of interest in the early 2000s. Analysts have less business pressure to withhold negative private information until negative public news arrives, so their recommendation changes respond to positive and negative news more symmetrically.

Regarding other variables, the coefficient on $AFIL_{ij}$ is significantly positive, which indicates that affiliated analysts are, on average, less likely to give favorable ratings after the 2000s. However, the coefficients on $AFIL_{ij} \times ADJRET3_{it}$ and $AFIL_{ij} \times ADJRET10_{it}$ are significantly positive. Thus, affiliated analysts are more likely than non-affiliated analysts to revise their recommendations to favorable ratings after positive news arrives. The coefficients on $LMNREC3_{it}$ and $LMNREC10_{it}$ are significantly positive as found before the 2000s, which supports the persistence of analyst herding behaviors (Palmon et al. 2020).

Overall, the extended results show that analysts still act as if they own private information despite curtailed selective disclosures to analysts under Regulation FD. The result of analysts' asymmetric responses is generically different. The asymmetric reactions to major negative news compared to positive news disappear under the regulatory reforms that aim to mitigate analysts' conflicts of interest, and analyst recommendations respond more symmetrically to major news after the 2000s.

[Table 8 here]

The results in Panels A1 and A2 of Table 9 are consistent with CCLR's findings that the asymmetry for negative and positive return events is present when using the probit model estimations to control for other factors, although the findings are weaker. Panels B1 and B2 in Table 9 show that analysts' average recommendation change after negative return events is close to zero for the extension samples. Table 9 additionally supports the results in Tables 7 and 8.

[Table 9 here]

IV. Discussion of Results

This paper replicates CCLR's main findings in the pre-2000 setting, when asymmetry exists between analysts' recommendation responses to positive and negative news. In Table 7, this paper confirms CCLR's results of a relatively small positive coefficient on positive price shocks in the sample of all recommendations and a sign-changing coefficient in the sample of interior recommendations. On average, analysts react more strongly to negative news by downgrading recommendations. The probability of upgrades and downgrades following positive return events is about equal, whereas the reaction following negative events is not. Before the 2000s, analysts act as if negative price movements permit them to relieve the business pressure of withholding negative private information and downgrade in a sticky way when negative public news arrives.

After the 2000s, the picture somehow changes. The unchanged part is that preceding price changes still predict analysts' recommendation ratings, as found by CCLR. Analysts still respond to large price changes as if they believe that they possess private information, even under Regulation FD, which raises concerns about increased information costs for analysts' private information production (Kothari et al. 2016). This result is consistent with the mosaic theory and the idea that analysts devote effort to private information production (Green et al. 2014; Koch et al. 2013). The part that changes concerns analysts' asymmetric responses to positive and negative return events. After the 2000s, analysts facing negative news become more equally likely to make recommendation upgrades or downgrades. The reduction in asymmetric responses supports the idea that regulatory reforms like Regulation FD and the 2003 Global Settlement effectively enhance analyst independence, mitigate optimistic bias, and relieve analysts' business pressure.

V. Additional Tests

A. Post-Event Returns: Old vs. New Pictures

Table 10 replicates CCLR's results on post-event returns between 1993 and 2000. This paper confirms that stock prices drop following downgrades, regardless of whether the return news is positive or negative before the rating change. Table 10 also shows no evidence of systematic price movement following upgrades. The tests of mean difference in returns suggest that the returns are not more negative following downgrades led by negative price changes compared to positive price changes. Analysts' downgrades after negative return events are not explained by analysts' ability to predict that prices will keep falling. Therefore, subsequent stock return performance cannot explain analysts' asymmetric responses to major news.

[Table 10 here]

Table 11 gives a different view of price movements following analyst recommendation changes in response to major news in the new information environment. The post-event returns are still negative for recommendation downgrades that follow either positive or negative news, but with smaller magnitudes than before the 2000s. This result is consistent with studies showing decreased informativeness of recommendations after Regulation FD (Gintschel and Markov 2004; Cornett et al. 2007; Palmon and Yezegel 2011). Substantial upgrades are followed by significantly positive returns in the 3-day window following either positive (0.50%) or negative news (0.66%) after the 2000s, whereas they were not before. This result is consistent with Kadan et al.'s (2009) finding of increased informativeness of favorable ratings after the Global Settlement.

[Table 11 here]

B. Earnings Announcement Events

As a robustness check, this paper re-estimates the probit model with the subsample of earnings announcement events as in CCLR. Before (after) the 2000s, untabulated results show that 57% (64%) of recommendation changes occur in the three days immediately following the earnings announcements. The re-estimations also control for the sign and magnitude of earnings surprises and the interaction term between earnings surprises and related price responses. In Panels

A1 and B1 of Table 12, the results based on the recommendations following earnings announcements indicate that analysts are more likely to downgrade following negative price shocks before the 2000s, but their recommendation changes become more balanced between upgrades and downgrades after the 2000s. The results are robust after controlling for earnings surprises in the earnings announcement setting. The main conclusions remain unchanged with the samples based on the recommendations that do not follow earnings announcements in Panels A2 and B2.

[Table 12 here]

C. Probit Results by Year

Figure 1 shows the yearly probit results, where the z-statistics are weighted averaged as in Tables 7 and 8. The coefficients on $ADJRET3_{it}$ ($NEGRET_{it} \times ADJRET3_{it}$) are significantly positive (negative) across almost all years, supporting the main results. Interestingly, the coefficients on $ADJRET3_{it} + NEGRET_{it} \times ADJRET3_{it}$ are still significantly negative in 2001 and 2002, but they are no longer significantly negative after 2003 except for 2019. Again, the sharp contrast before and after 2003 strengthens the inference that the Global Settlement curtails analysts' conflicts of interest.

[Figure 1 here]

VI. Conclusion

This paper replicates and extends CCLR's paper on how analysts' recommendations respond to public news. Based on the sample from 1993 to 2000, we replicate CCLR's finding of an asymmetry between the results for positive and negative return events. Our replication results are consistent with their findings that analysts behave as if they have private information and that analysts are more likely to downgrade their recommendations after large price shocks, possibly due to conflicts of interest. This paper also finds that affiliated analysts are more likely to upgrade their recommendations, and there is evidence of herding behavior among analysts. We conclude that CCLR's findings in the pre-2000 setting are highly replicable.

Based on the sample from 2001 to 2019, we examine whether CCLR's findings still hold after Regulation FD and the Global Settlement. On the one hand, analysts still act as if they have private information under Regulation FD. Analysts still make recommendation changes following major return events, as predicted by the increased effort argument and the mosaic theory. On the other hand, analysts' recommendations become less sticky to downgrades when facing negative information shocks after the 2000s. The asymmetry between the results for positive and negative return events disappears under the new information environment. Furthermore, affiliated analysts are less likely to give favorable recommendations without positive information as justification. These results support the effectiveness of regulatory efforts on average in mitigating analysts' conflicts of interest.

Both Regulation FD and the 2003 Global Settlement are believed to have changed analysts' information environment. This paper finds that analysts' private information production after major news events continues, and the recommendation revisions following negative news become more balanced between upgrades and downgrades since the passage of these regulations. This paper demonstrates how the actual replication of a published paper can help to critically evaluate the reproducibility of published results and assess their generalizability after drastic changes occur in the reporting environment.

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Appendix A. 1% Tails of the Distribution of Standardized Market-adjusted Returns

Sample	Lower 1% cutoff values for $ADJRET3_{it}$	Upper 1% cutoff values for $ADJRET3_{it}$
Replication: 1993 to 2000	-2.59	3.13
Extension: 2001 to 2019	-2.68	3.01
By year:		
1993	-2.42	2.61
1994	-2.46	2.79
1995	-2.49	3.00
1996	-2.45	3.00
1997	-2.50	3.06
1998	-3.04	3.51
1999	-2.45	3.15
2000	-2.57	3.32
2001	-2.32	2.88
2002	-2.70	2.89
2003	-2.09	2.64
2004	-2.43	2.76
2005	-2.56	2.90
2006	-2.54	2.93
2007	-3.03	3.40
2008	-3.61	3.95
2009	-2.16	2.81
2010	-2.18	2.57
2011	-2.85	3.16
2012	-2.42	2.69
2013	-2.56	2.93
2014	-2.82	3.01
2015	-2.91	3.19
2016	-2.76	3.17
2017	-2.64	2.87
2018	-2.95	3.06
2019	-2.72	2.93

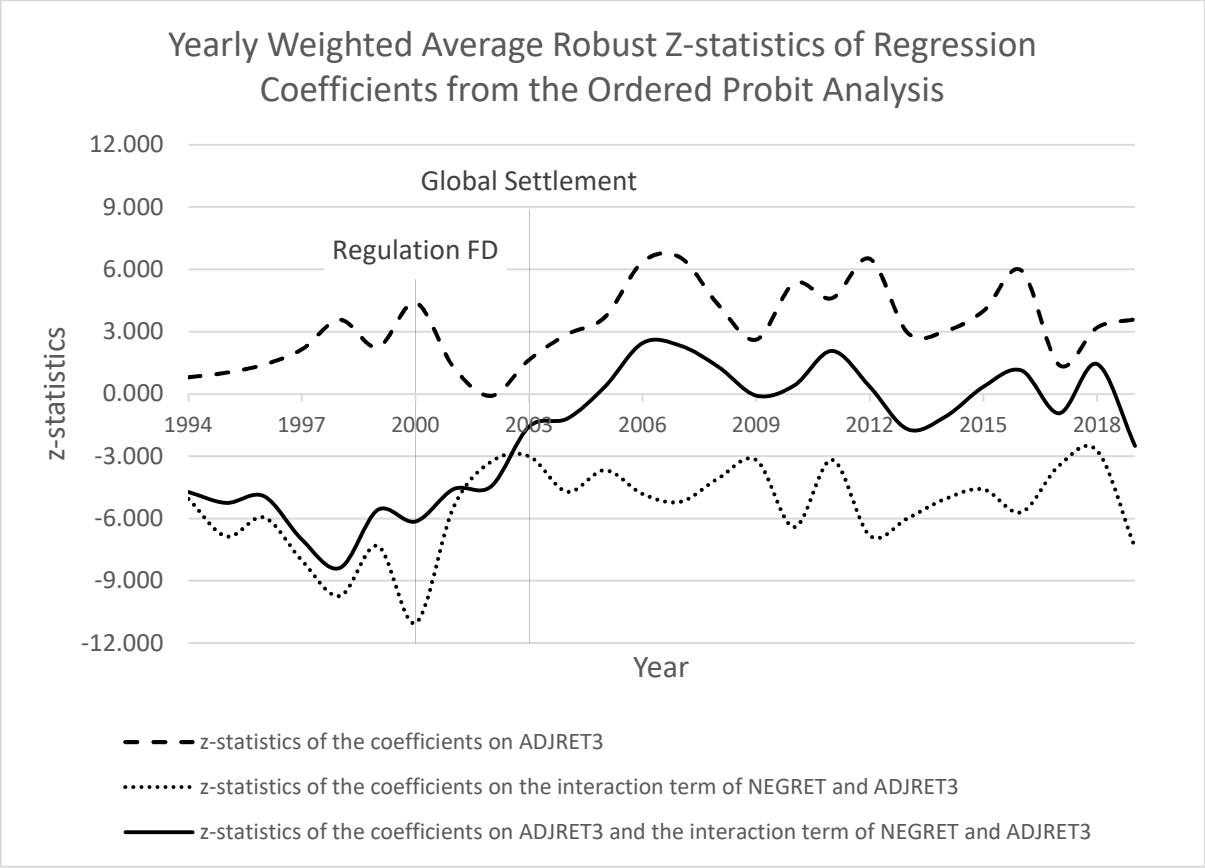
Appendix A tabulates the lower 1% and the upper 1% cutoff values for $ADJRET3_{it}$ in the replication sample, the extension sample, and the samples partitioned by year.

Appendix B. Variable Definitions

Variable	Definition
REC_{ijt}	Recommendation level for firm i by analyst j on day t, $t = -20, \ldots, +20$.
$ADJRET3_{it}$	The standardized market-adjusted return for firm i for the three days preceding analyst j's recommendation change at day t. $$ADJRET3_{it} = \frac{[r_{it} - r_{mt}]}{\sigma_{it}(r_{it} - r_{mt})}$$ where r_{it} is the $[-3, -1]$ three-day compounded returns preceding day t; r_{mt} is the contemporaneous three-day value-weighted market return; $\sigma_{it}(r_{it} - r_{mt})$ is the return volatility of the net-of-market returns, $r_{it} - r_{mt}$, running from day -3 to day -249.
$NEGRET_{it}$	Indicator variable coded 1 if $ADJRET3_{it} < 0$, and 0 otherwise.
$ADJRET10_{it}$	The standardized market-adjusted return for firm i for the 10 days commencing 13 days before and ending four days before analyst j's recommendation change at day t.
$AFIL_{ij}$	Indicator variable coded 1 if analyst j's firm has an investment banking relationship with firm i as of day t, and zero otherwise. Following CCLR, we matched firms on CUSIPs common to the IBES and Securities Data Corporation (SDC) datasets. An investment banking relationship is assumed to exist if the SDC dataset indicates the analyst's firm sponsored any debt or equity offering or merger and acquisition activity at any time during the sample period.[11]
$LMNREC3_{it}$	Mean recommendation change for firm i for the three days preceding analyst j's recommendation change at day t; calculated as the mean recommendation level at day $t-1$ minus the mean recommendation level at day $t-4$.
$LMNREC10_{it}$	Mean recommendation change for firm i for the 10 days commencing 13 days before and ending four days before analyst j's recommendation change at day t; calculated as the mean recommendation level at day $t-4$ minus the mean recommendation level at day $t-13$.
$NUMREC_{it}$	Number of analysts following firm i at time t.
$LPERC3_{it}$	Percentage of analysts following firm i on day t who change their recommendations during the three days preceding analyst j's recommendation change on day t.
$LPERC10_{it}$	Percentage of analysts following firm i on day t who change their recommendations during the 10 days commencing 13 days before and ending four days before analyst j's recommendation change on day t.
AGE_i	Number of years between the current year and the year firm i first appears on CRSP.
MVE_{it}	Equity market values (in thousands) on day t for firm i.
$PRICE_{it}$	Stock price for firm i on day t.
$SMALL_i$	Indicator variable coded 1 if a firm is in the smallest equity market value decile for all sample observations within the quarter in which day t falls, and zero otherwise.

[11] Since the IBES broker translation files is no longer available in IBES, this paper refers to publicly available matching information, such as data from Hashim (2012), as well as internet search, and manually matches broker names between IBES and SDC files for the IBES brokerage firms with top 30 numbers of firms covered in the sample period and for other brokerage firms with available matching information.

Figure 1. Ordered Probit Analysis by Year



Description: Based on the sample from 1994 to 2019, Figure 1 shows the yearly results for the ordered probit regression of recommendation levels following three-day standardized returns within the ± 20 days surrounding returns in the 1% Sample defined in Table 1.[12] We estimate five separate regressions corresponding to each lagged recommendation level by year and then calculate weighted average coefficient and z-statistic estimates utilizing the number of observations in each yearly regression as the weights. Reported results all correspond to the probability of being in the strong sell, sell, or hold recommendation categories. The dashed curve represents the z-statistic series of the coefficients on $ADJRET3_{it}$; the dotted curve represents the z-statistic series of the coefficients on $NEGRET_{it} \times ADJRET3_{it}$; the solid curve represents the z-statistic series of the total coefficients on $ADJRET3_{it} + NEGRET_{it} \times ADJRET3_{it}$.

Interpretation: The yearly results support the idea that the 2003 Global Settlement mitigates analysts' conflicts of interest. After 2003, analyst recommendations respond more symmetrically to major news.

[12] The year 1993 is excluded here due to low variations of some control variables in its subsample with $LREC = 3$.

Table 1. Recommendation Changes and Levels

Panel A. Recommendation Changes and Levels: Replication

	All Firms	1% Sample	Probit Sample
Upgrades	50,451	1,830	14,948
Downgrades	61,763	4,071	20,803
Initializations	83,710	0	0
Affirmations	27,037	659	6,804
No Changes	36,799,808	258,225	6,730,815
Total obs.	37,022,769	264,785	6,773,370
Strong buy	12,074,024	77,489	2,009,792
Buy	12,613,497	88,688	2,288,689
Hold	11,306,197	90,376	2,268,546
Sell	531,919	4,301	107,423
Strong sell	497,132	3,931	98,920

Panel B. Recommendation Changes and Levels: Extension

	All Firms	1% Sample	Probit Sample
Upgrades	134,902	5,478	41,647
Downgrades	171,949	9,383	56,494
Initializations	134,455	0	0
Affirmations	97,090	1,759	22,495
No Changes	120,011,106	1,005,008	26,133,726
Total obs.	120,549,502	1,021,628	26,254,362
Strong buy	27,689,892	201,323	5,266,294
Buy	35,766,035	273,304	7,147,711
Hold	49,054,552	462,028	11,733,359
Sell	6,302,971	67,028	1,676,292
Strong sell	1,736,052	17,945	430,706

Description: Based on the replication (extension) sample from 1993 to 2000 (2001 to 2019), Panel A (Panel B) of Table 1 documents the frequency of recommendations across different subsamples and categories. All recommendations are between 1 (strong buy) and 5 (strong sell). The "All Firms" sample represents the total number of observations after filling in the days between IBES recommendations dates as "No Changes." The 1% Sample represents recommendation changes on the day following a standardized CRSP three-day market-adjusted return within the 1% tails of the distribution for sample firms. The Probit Sample includes the ± 20 days surrounding event dates identified in the 1% Sample.

Interpretation: During the 1993 to 2000 replication period, Panel A shows that "No Changes" dominates all three samples under the "filling in the holes" approach used by CCLR. During the 2001 to 2019 extension period, Panel B shows that "No Changes" also dominates all samples.

Table 2. Recommendation Changes by Category

Panel A. Recommendation Changes by Category: Replication

	1% Sample		Probit Sample	
Rec Change	Frequency	% of Total	Frequency	% of Total
Upgrade +1	1,317	0.50%	10,727	0.16%
Upgrade +2	473	0.18%	3,911	0.06%
Upgrade +3	29	0.01%	204	0.00%
Upgrade +4	11	0.00%	106	0.00%
Downgrade −1	2,639	1.00%	13,997	0.21%
Downgrade −2	1,338	0.51%	6,299	0.09%
Downgrade −3	65	0.02%	343	0.01%
Downgrade −4	29	0.01%	164	0.00%
No Changes	258,225	97.52%	6,730,815	99.37%

Panel B. Recommendation Changes by Category: Extension

	1% Sample		Probit Sample	
Rec Change	Frequency	% of Total	Frequency	% of Total
Upgrade +1	3,423	0.34%	26,078	0.10%
Upgrade +2	1,996	0.20%	14,958	0.06%
Upgrade +3	30	0.00%	367	0.00%
Upgrade +4	29	0.00%	244	0.00%
Downgrade −1	5,607	0.55%	34,854	0.13%
Downgrade −2	3,602	0.35%	20,563	0.08%
Downgrade −3	96	0.01%	623	0.00%
Downgrade −4	78	0.01%	454	0.00%
No Changes	1,005,008	98.37%	26,133,726	99.54%

Description: Based on the replication (extension) sample from 1993 to 2000 (2001 to 2019), Panel A (Panel B) of Table 2 documents the frequency of recommendation changes across different subsamples and categories. The 1% Sample represents recommendation changes on the day following a standardized CRSP three-day market-adjusted return within the 1% tails of the distribution for sample firms. The Probit Sample includes the ± 20 days surrounding event dates identified in the 1% Sample. "Rec Change" represents the corresponding recommendation change that occurs the day after the corresponding three-day return ends. "% of Total" is relative to the total number of observations in the 1% Sample or the Probit Sample.

Interpretation: During the 1993 to 2000 replication period, Panel A shows that downgrades are more common than upgrades, which is consistent with analysts' optimistic bias in the level of recommendations. During the 2001 to 2019 extension period, Panel B shows that while downgrades are still more common than upgrades, the proportions of downgrades slightly decrease when compared to the proportions during the 1993 to 2000 period.

Table 3. Recommendation Change and Return Descriptive Statistics Based on the Sign of Standardized Market-Adjusted Return: 1% Samples

Return Sign	Grade	No. of Obs.	Mean Return	Median Return	Max. Return	Min. Return
Panel A. 1% Sample: Replication						
Negative	Upgrade	880	-3.69	-3.22	-2.59	-16.54
Negative	Downgrade	3,117	-4.48	-3.86	-2.59	-21.12
Negative	Affirm	403	-3.87	-3.33	-2.59	-12.07
Negative	No Change	135,640	-3.35	-3.02	-2.59	-21.08
Positive	Upgrade	950	4.40	3.85	23.05	3.13
Positive	Downgrade	954	5.48	4.18	38.45	3.13
Positive	Affirm	256	4.08	3.72	11.14	3.13
Positive	No Change	122,585	3.98	3.65	38.64	3.13
Total obs.		264,785				
Panel B. 1% Sample: Extension						
Negative	Upgrade	2,999	-4.19	-3.59	-2.68	-25.35
Negative	Downgrade	5,556	-4.65	-3.83	-2.68	-33.01
Negative	Affirm	1,007	-3.81	-3.30	-2.68	-16.37
Negative	No Change	533,251	-3.63	-3.21	-2.68	-33.01
Positive	Upgrade	2,479	4.70	3.91	43.90	3.01
Positive	Downgrade	3,827	6.03	4.59	36.40	3.01
Positive	Affirm	752	4.26	3.74	17.65	3.01
Positive	No Change	471,757	4.00	3.59	69.51	3.01
Total obs.		1,021,628				

Description: Based on the replication (extension) sample from 1993 to 2000 (2001 to 2019), Panel A (Panel B) of Table 3 documents standardized CRSP three-day market-adjusted return descriptive statistics for firms within the 1% tails of the return distribution for sample firms. Standardized returns are calculated utilizing three-day market-adjusted returns scaled by the standard deviation of three-day market-adjusted return over day -3 to day -249. "Return Sign" is designated as positive (negative) if the preceding three-day return was greater than or equal to (less than) zero, i.e., $NEGRET_{it} = 0$ (1). "Grade" represents the recommendation change occurring on the day following the final day of the standardized three-day return.

Interpretation: During the 1993 to 2000 replication period, the proportion of upgrades and downgrades associated with positive and negative return events differs dramatically. During the 2001 to 2019 extension period, the proportion of upgrades and downgrades associated with positive and negative return events still differs, but not as dramatically as it did during the 1993 to 2000 period.

Table 4. Recommendation Change and Return Descriptive Statistics Based on the Sign of Standardized Market-Adjusted Return: Probit Sample

Return Sign	Grade	No. of Obs.	Mean Return	Median Return	Max. Return	Min. Return
Panel A. Probit Sample: Replication						
Negative	Upgrade	7,249	-1.35	-0.91	0.00	-16.54
Negative	Downgrade	13,087	-2.01	-1.29	0.00	-21.41
Negative	Affirm	3,724	-1.32	-0.89	0.00	-12.07
Negative	No Change	3,584,477	-0.95	-0.71	0.00	-24.87
Positive	Upgrade	7,699	1.58	1.08	23.05	0.00
Positive	Downgrade	7,716	1.67	0.92	38.45	0.00
Positive	Affirm	3,080	1.25	0.82	25.87	0.00
Positive	No Change	3,146,338	1.04	0.73	49.45	0.00
Total obs.		6,773,370				
Panel B. Probit Sample: Extension						
Negative	Upgrade	20,953	-1.51	-0.92	0.00	-25.35
Negative	Downgrade	31,220	-1.72	-1.01	0.00	-33.01
Negative	Affirm	11,767	-1.19	-0.77	0.00	-16.54
Negative	No Change	13,457,010	-0.94	-0.65	0.00	-33.01
Positive	Upgrade	20,694	1.51	0.93	43.90	0.00
Positive	Downgrade	25,274	1.84	0.89	36.40	0.00
Positive	Affirm	10,728	1.18	0.76	29.19	0.00
Positive	No Change	12,676,716	0.97	0.65	70.59	0.00
Total obs.		26,254,362				

Description: Based on the replication (extension) sample from 1993 to 2000 (2001 to 2019), Panel A (Panel B) of Table 4 documents standardized CRSP three-day market-adjusted return descriptive statistics for firms within the 1% tails of the return distribution for sample firms in the Probit Sample, which includes the ± 20 days surrounding event dates identified in the 1% Sample. Standardized returns are calculated utilizing three-day market-adjusted returns scaled by the standard deviation of three-day market-adjusted return over day -3 to day -249. "Return Sign" is designated as positive (negative) if the preceding three-day return was greater than or equal to (less than) zero, i.e., $NEGRET_{it} = 0$ (1). "Grade" represents the recommendation change occurring on the day following the final day of the standardized three-day return.

Interpretation: The proportion of upgrades and downgrades associated with positive and negative return events differs dramatically during the 1993 to 2000 replication period. During the 2001 to 2019 extension period, the proportion of upgrades and downgrades associated with negative return events is distributed more symmetrically than it was during the 1993 to 2000 period.

Table 5. Recommendation Change Probability Matrices

	1% Sample Transition Matrix New recommendation						Probit Sample Transition Matrix New recommendation				
Panel A1. Negative Returns: Replication											
$LREC$	1	2	3	4	5	$LREC$	1	2	3	4	5
1	95.82%	1.91%	2.17%	0.06%	0.04%	1	99.30%	0.35%	0.33%	0.01%	0.01%
2	0.77%	96.63%	2.48%	0.09%	0.03%	2	0.21%	99.39%	0.38%	0.02%	0.01%
3	0.37%	0.56%	98.75%	0.17%	0.16%	3	0.13%	0.20%	99.61%	0.03%	0.03%
4	0.00%	0.36%	1.31%	98.24%	0.09%	4	0.05%	0.14%	0.45%	99.31%	0.05%
5	0.14%	0.72%	1.05%	0.14%	97.95%	5	0.09%	0.14%	0.47%	0.04%	99.26%
Avg. recommendation change					0.022	Avg. recommendation change					0.002
Panel A2. Positive Returns: Replication											
$LREC$	1	2	3	4	5	$LREC$	1	2	3	4	5
1	98.66%	0.56%	0.71%	0.04%	0.03%	1	99.55%	0.23%	0.20%	0.01%	0.01%
2	0.62%	98.46%	0.84%	0.05%	0.02%	2	0.23%	99.50%	0.26%	0.01%	0.01%
3	0.54%	0.87%	98.42%	0.08%	0.09%	3	0.16%	0.27%	99.52%	0.02%	0.02%
4	0.41%	0.82%	1.63%	97.10%	0.05%	4	0.07%	0.21%	0.56%	99.12%	0.04%
5	0.46%	0.34%	1.54%	0.06%	97.61%	5	0.13%	0.14%	0.46%	0.03%	99.23%
Avg. recommendation change					0.001	Avg. recommendation change					0.000
Panel B1. Negative Returns: Extension											
$LREC$	1	2	3	4	5	$LREC$	1	2	3	4	5
1	97.90%	0.35%	1.65%	0.05%	0.05%	1	99.55%	0.10%	0.33%	0.01%	0.01%
2	0.22%	98.00%	1.68%	0.09%	0.01%	2	0.05%	99.58%	0.34%	0.02%	0.00%
3	0.35%	0.46%	98.88%	0.22%	0.08%	3	0.10%	0.13%	99.68%	0.07%	0.03%
4	0.02%	0.10%	1.07%	98.78%	0.02%	4	0.02%	0.04%	0.33%	99.60%	0.01%
5	0.16%	0.02%	2.16%	0.18%	97.48%	5	0.06%	0.01%	0.60%	0.05%	99.28%
Avg. recommendation change					0.007	Avg. recommendation change					0.001
Panel B2. Positive Returns: Extension											
$LREC$	1	2	3	4	5	$LREC$	1	2	3	4	5
1	98.38%	0.20%	1.36%	0.02%	0.03%	1	99.61%	0.08%	0.29%	0.01%	0.01%
2	0.11%	98.52%	1.30%	0.05%	0.01%	2	0.05%	99.64%	0.29%	0.01%	0.00%
3	0.31%	0.45%	99.03%	0.15%	0.06%	3	0.10%	0.15%	99.67%	0.05%	0.02%
4	0.06%	0.19%	1.49%	98.20%	0.06%	4	0.02%	0.05%	0.36%	99.55%	0.02%
5	0.16%	0.01%	2.05%	0.07%	97.70%	5	0.05%	0.01%	0.53%	0.04%	99.36%
Avg. recommendation change					0.004	Avg. recommendation change					0.001

Description: Table 5 presents the frequency percentages of movements in recommendations within both the 1% and Probit Samples. $LREC$ is the recommendation level on the day prior to the recommendation change (i.e., the lagged recommendation), where 1 represents a strong buy and 5 represents a strong sell. The 1% and Probit Sample transition matrices are calculated by dividing the frequencies in each cell by the sum of all frequencies in a given row (i.e., the probability for $LREC = 1$ and New Recommendation $= 1$ is calculated by taking the number of times this occurs in the sample and dividing by the total number of times $LREC = 1$). Average recommendation changes are calculated by multiplying the indicated probability by the corresponding recommendation change and summing across all possible recommendation change categories where upgrades (downgrades) are recorded as negative (positive) numbers. The changes are weighted by the total number of observations in their corresponding $LREC$ level relative to the total number of observations for the respective sample.

Interpretation: In Panels A1 and A2 for the 1% Sample during the 1993 to 2000 replication period, the average daily recommendation change following a large negative return is 0.022, indicating a downgrade,

whereas the change following a large positive return is 0.001. For the Probit Sample during the same replication period, the unconditional probability of an analyst recommendation change is essentially zero. In Panels B1 and B2 for the 1% Sample during the 2001 to 2019 extension period, the average daily recommendation change following a large negative return is 0.007, much lower than 0.022 in the replication sample. For the Probit Sample during the 2001 to 2019 period, the unconditional probability of an analyst recommendation change is close to zero.

Table 6. Probit Sample Summary Statistics

Panel A1. Descriptive Statistics: Replication

Variable	Mean	Median	Std. Dev.
$ADJRET3_{it}$	-0.02	-0.08	1.41
$ADJRET10_{it}$	-0.05	-0.12	1.50
$AFIL_{ij}$	0.26	0.00	0.44
$LMNREC3_{it}$	0.00	0.00	0.08
$LMNREC10_{it}$	0.00	0.00	0.13
$NUMREC_{it}$	7.57	6.00	5.90
$LPERC3_{it}$	0.01	0.00	0.07
$LPERC10_{it}$	0.04	0.00	0.11
AGE_i	20.50	13.03	19.77
MVE_{it}	9,001,034	1,540,397	21,716,688
$PRICE_{it}$	34.84	27.75	187.69

Panel A2. Average Returns by Return Sign: Replication

Return Sign	Variable	Mean	Median
Negative	$ADJRET3_{it}$	-0.95	-0.71
Negative	$ADJRET10_{it}$	-0.02	-0.12
Positive	$ADJRET3_{it}$	1.05	0.73
Positive	$ADJRET10_{it}$	-0.09	-0.13

Panel B1. Descriptive Statistics: Extension

Variable	Mean	Median	Std. Dev.
$ADJRET3_{it}$	-0.01	-0.03	1.42
$ADJRET10_{it}$	-0.03	-0.06	1.50
$AFIL_{ij}$	0.38	0.00	0.49
$LMNREC3_{it}$	0.00	0.00	0.06
$LMNREC10_{it}$	0.00	0.00	0.10
$NUMREC_{it}$	10.01	9.00	6.73
$LPERC3_{it}$	0.01	0.00	0.05
$LPERC10_{it}$	0.03	0.00	0.08
AGE_i	22.52	16.58	19.18
MVE_{it}	12,462,392	2,946,822	28,324,944
$PRICE_{it}$	50.47	29.20	1,117.36

Panel B2. Average Returns by Return Sign: Extension

Return Sign	Variable	Mean	Median
Negative	$ADJRET3_{it}$	-0.94	-0.65
Negative	$ADJRET10_{it}$	-0.02	-0.06
Positive	$ADJRET3_{it}$	0.97	0.65
Positive	$ADJRET10_{it}$	-0.04	-0.06

Description: In Table 6, the Probit Sample represents recommendation changes following three-day standardized returns within the ± 20 days surrounding observations in the 1% return tails of the distribution for sample firms. Panel A1 (Panel B1) presents the mean, median, and standard deviations of variables utilized in the ordered probit estimation for the replication (extension) sample. Panel A2 (Panel B2) documents descriptive statistics for the return variables, $ADJRET3_{it}$ and $ADJRET10_{it}$, based on the sign of $ADJRET3_{it}$ in the replication (extension) sample.

Interpretation: Based on the 1993 to 2000 replication sample (2001 to 2019 extension sample), Panel A1 (Panel B1) summarizes the sample firm attributes. The mean firm in the replication (extension) sample is 20.50 (22.52) years old, has a price of $34.84 ($50.47), and has approximately $9 ($12.46) billion of equity market values. About 26% (38%) of sample firms in the replication (extension) sample have an affiliation with the brokerage firms that offer their stock recommendations. The mean recommendation changes before major news are near zero, suggesting that analysts rarely change recommendations. Panel A2 shows the summary statistics for the return variables. The results in Panels A1 and A2 are similar to those reported by CCLR (2006). In Panels A2 and B2, the mean standardized 10-day returns preceding the three-day returns support price reversals for the positive return events, as shown by CCLR (2006).

Table 7. Ordered Probit Analysis of the Likelihood of Recommendation Change: Replication

Panel A. Coefficient Summaries

Variable	All Recommendations		Interior Recommendations	
	Coefficient	z-Stat.	Coefficient	z-Stat.
$ADJRET3_{it}$	0.018	6.15	-0.010	-1.43
$NEGRET_{it}$	0.013	1.06	0.008	0.55
$NEGRET_{it} \times ADJRET3_{it}$	-0.102	-21.30	-0.020	-4.03
$ADJRET10_{it}$	0.001	0.34	0.003	1.09
$AFIL_{ij}$	-0.029	-3.76	0.007	0.58
$AFIL_{ij} \times ADJRET3_{it}$	-0.002	-0.38	0.000	0.09
$AFIL_{ij} \times ADJRET10_{it}$	-0.006	-1.37	-0.005	-1.13
$LMNREC3_{it}$	0.326	7.20	0.179	3.82
$LMNREC10_{it}$	0.089	2.83	0.019	0.60
$NUMREC_{it}$	0.000	-0.46	0.001	1.83
$LPERC3_{it}$	-0.051	-0.64	-0.113	-2.20
$LPERC10_{it}$	0.018	1.14	-0.036	-0.88
AGE_i	0.001	5.88	0.001	6.29
MVE_{it}	0.000	-0.90	0.000	-1.42
$PRICE_{it}$	-0.002	-13.73	-0.001	-9.77
$SMALL_{it}$	0.128	6.93	0.091	5.02
$SMALL_{it} \times ADJRET3_{it}$	-0.035	-3.09	-0.027	-2.32
$ADJRET3_{it} + NEGRET_{it} \times ADJRET3_{it}$	-0.038	-16.56	-0.017	-6.24

Panel B. Return Coefficients by Lagged Recommendation Level

Variable	Lagged Recommendation Level ($LREC$)				
	1	2	3	4	5
$ADJRET3_{it}$	0.102	0.039	-0.067	-0.067	-0.124
	(26.03)	(7.20)	(-11.31)	(-4.98)	(-11.06)
$ADJRET3_{it} + NEGRET_{it} \times ADJRET3_{it}$	-0.071	-0.046	-0.005	0.002	0.005
	(-34.77)	(-17.01)	(-1.46)	0.17	0.46
No. of Obs.	2,013,037	2,290,086	2,264,449	107,141	98,657

Description: Based on the replication sample from 1993 to 2000, Table 7 presents the results of the ordered probit regression of recommendation levels following three-day standardized returns within the ± 20 days surrounding returns in the 1% Sample defined in Table 1. We estimate five separate regressions corresponding to each lagged recommendation level and then calculate weighted average coefficient and z-statistic estimates utilizing the number of observations in each regression as the weights. The "All Recommendations" columns utilize all lagged recommendation levels to derive coefficient and significance estimates, whereas the "Interior Recommendations" columns utilize only lagged recommendation levels 2, 3, and 4. Reported results all correspond to the probability of being in the strong sell, sell, or hold recommendation categories. Z-statistics are in parentheses.

Interpretation: During the 1993 to 2000 replication period, the probit analysis shows that analysts respond to large price shocks ($ADJRET3_{it}$ and $NEGRET_{it} \times ADJRET3_{it}$) and systematically respond much more strongly to large negative price shocks ($ADJRET3_{it} + NEGRET_{it} \times ADJRET3_{it}$). The replication results offer the same conclusions as CCLR's (2006).

Table 8. Ordered Probit Analysis of the Likelihood of Recommendation Change: Extension

Panel A. Coefficient Summaries

Variable	All Recommendations		Interior Recommendations	
	Coefficient	z-Stat.	Coefficient	z-Stat.
$ADJRET3_{it}$	0.029	15.78	0.009	7.08
$NEGRET_{it}$	0.031	6.52	0.027	5.86
$NEGRET_{it} \times ADJRET3_{it}$	-0.048	-19.83	-0.005	-5.55
$ADJRET10_{it}$	0.020	11.41	0.016	9.68
$AFIL_{ij}$	0.016	6.15	0.033	9.51
$AFIL_{ij} \times ADJRET3_{it}$	-0.016	-6.11	-0.013	-5.25
$AFIL_{ij} \times ADJRET10_{it}$	-0.011	-4.46	-0.010	-4.14
$LMNREC3_{it}$	0.378	11.04	0.293	8.15
$LMNREC10_{it}$	0.191	8.95	0.139	6.49
$NUMREC_{it}$	0.000	2.03	0.001	4.61
$LPERC3_{it}$	0.125	4.81	0.013	0.98
$LPERC10_{it}$	0.037	1.74	0.002	0.11
AGE_i	0.000	0.71	0.000	3.91
MVE_{it}	0.000	-11.19	0.000	-9.80
$PRICE_{it}$	0.000	-4.90	0.000	-4.92
$SMALL_{it}$	0.107	9.51	0.089	8.22
$SMALL_{it} \times ADJRET3_{it}$	-0.032	-5.94	-0.025	-4.56
$ADJRET3_{it} + NEGRET_{it} \times ADJRET3_{it}$	-0.001	-0.28	0.004	2.72

Panel B. Return Coefficients by Lagged Recommendation Level

Variable	Lagged Recommendation Level ($LREC$)				
	1	2	3	4	5
$ADJRET3_{it}$	0.108	0.109	-0.033	-0.091	-0.089
	(44.68)	(51.02)	(-12.31)	(-20.71)	(-16.61)
$ADJRET3_{it} + NEGRET_{it} \times ADJRET3_{it}$	-0.027	-0.020	0.017	0.025	0.028
	(-15.59)	(-10.61)	(11.39)	(8.28)	(7.85)
No. of Obs.	5,272,271	7,153,761	11,724,140	1,674,266	429,924

Description: Based on the extension sample from 2001 to 2019, Table 8 presents the results of the ordered probit regression of recommendation levels following three-day standardized returns within the ± 20 days surrounding returns in the 1% Sample defined in Table 1. We estimate five separate regressions corresponding to each lagged recommendation level and then calculate weighted average coefficient and z-statistic estimates utilizing the number of observations in each regression as the weights. The "All Recommendations" columns utilize all lagged recommendation levels to derive coefficient and significance estimates, whereas the "Interior Recommendations" columns utilize only lagged recommendation levels 2, 3, and 4. Reported results all correspond to the probability of being in the strong sell, sell, or hold recommendation categories. Z-statistics are in parentheses.

Interpretation: During the 2001 to 2019 extension period, the probit analysis shows that analysts still respond to large price shocks ($ADJRET3_{it}$ and $NEGRET_{it} \times ADJRET3_{it}$) but respond symmetrically to large negative and positive price shocks ($ADJRET3_{it} + NEGRET_{it} \times ADJRET3_{it}$).

Table 9. Probit Sample Large Return Transition Matrix

	New Recommendation				
Panel A1. Negative Returns: Replication					
LREC	1	2	3	4	5
1	99.47%	0.25%	0.25%	0.01%	0.02%
2	0.23%	99.42%	0.33%	0.01%	0.01%
3	0.11%	0.18%	99.64%	0.04%	0.04%
4	0.05%	0.14%	0.41%	99.34%	0.06%
5	0.08%	0.09%	0.29%	0.02%	99.52%
Avg. recommendation change		0.002			
Panel A2. Positive Returns: Replication					
LREC	1	2	3	4	5
1	99.22%	0.40%	0.36%	0.01%	0.01%
2	0.18%	99.45%	0.35%	0.01%	0.01%
3	0.26%	0.39%	99.33%	0.01%	0.01%
4	0.11%	0.29%	0.79%	98.79%	0.02%
5	0.22%	0.27%	0.84%	0.07%	98.59%
Avg. recommendation change		0.001			
Panel B1. Negative Returns: Extension					
LREC	1	2	3	4	5
1	99.67%	0.07%	0.24%	0.01%	0.01%
2	0.11%	99.65%	0.22%	0.02%	0.00%
3	0.10%	0.14%	99.67%	0.06%	0.03%
4	0.03%	0.04%	0.30%	99.61%	0.02%
5	0.06%	0.01%	0.43%	0.04%	99.47%
Avg. recommendation change		0.000			
Panel B2. Positive Returns: Extension					
LREC	1	2	3	4	5
1	99.31%	0.14%	0.52%	0.02%	0.01%
2	0.02%	99.40%	0.54%	0.03%	0.00%
3	0.14%	0.19%	99.61%	0.04%	0.02%
4	0.04%	0.10%	0.66%	99.20%	0.00%
5	0.09%	0.02%	0.85%	0.07%	98.97%
Avg. recommendation change		0.001			

Description: Based on the replication sample from 1993 to 2000 (extension sample from 2001 to 2019), Panels A1 and A2 (Panels B1 and B2) provides transition matrices derived from the coefficients presented in Table 7 (Table 8), holding all continuous variables at their means, all indicator variables at 0, and setting the three-day adjusted return variables equal to their 1% cutoff points. Average recommendation changes are calculated by multiplying the indicator probability by the corresponding recommendation change and summing across all possible recommendation change categories where upgrades are recorded as negative numbers and downgrades are recorded as positive numbers. The changes are weighted by the total number of observations in their corresponding $LREC$ level relative to the total number of observations for the respective sample. $LREC$ is the recommendation level on the day prior to the recommendation change, i.e., the lagged recommendation, where 1 represents strong buy and 5 represents strong sell.

Interpretation: During the 1993 to 2000 replication period, Panel A1 shows that the expected daily recommendation change conditional on a negative return event is 0.002, while Panel A2 shows that the change conditional on a positive return event is 0.001. The replication results in Panels A1 and A2 are consistent with CCLR's results, but weaker. During the 2001 to 2019 extension period, Panel B1 shows that the expected daily recommendation change conditional on a negative return event is essentially zero, while Panel B2 shows that the change conditional on a positive return event is 0.001.

Table 10. Future Market-Adjusted Returns Following Recommendation Changes (1% Sample): Replication

			Post 3 Days		Post 20 Days		Post 60 Days	
Rec Change	Return Sign	Obs.	Mean	Median	Mean	Median	Mean	Median
Down ≤ -2	Negative	1,074	-0.23%	**-0.79%**	**-2.25%**	**-3.55%**	**-5.44%**	**-6.63%**
	Positive	358	**-1.21%**	-0.66%	**-3.69%**	**-3.32%**	**-6.57%**	**-4.92%**
	Difference		**0.98%**	-0.13%	1.44%	-0.23%	1.13%	-1.71%
Down -1	Negative	2,043	0.00%	**-0.58%**	**-1.82%**	**-2.64%**	**-5.04%**	**-5.69%**
	Positive	596	**-1.03%**	**-1.03%**	**-2.30%**	**-2.94%**	**-4.90%**	**-5.30%**
	Difference		**1.03%**	0.45%	0.48%	0.30%	-0.14%	-0.39%
Up $+1$	Negative	658	0.45%	-0.12%	-0.64%	-0.31%	**-3.18%**	**-2.81%**
	Positive	659	-0.36%	**-0.68%**	0.32%	0.27%	0.62%	-1.73%
	Difference		**0.81%**	0.56%	-0.96%	-0.58%	**-3.80%**	-1.08%
Up $\geq +2$	Negative	222	-0.54%	-0.43%	-1.54%	-1.34%	-2.93%	-1.54%
	Positive	291	0.01%	-0.03%	0.46%	0.54%	-1.75%	-1.43%
	Difference		-0.55%	-0.40%	-2.00%	-1.88%	-1.18%	-0.11%
Affirm	Negative	403	0.56%	-0.11%	-0.38%	-0.99%	**-2.96%**	**-4.17%**
	Positive	256	-0.80%	-0.56%	-0.70%	-1.10%	**-3.70%**	**-3.71%**
	Difference		**1.36%**	0.45%	0.32%	0.11%	0.74%	-0.46%
No Change	Negative	135,640	**0.35%**	**-0.15%**	**-0.52%**	**-1.30%**	**-2.75%**	**-3.96%**
	Positive	122,585	**-0.62%**	**-0.85%**	**-1.41%**	**-2.15%**	**-3.43%**	**-5.53%**
	Difference		**0.97%**	**0.70%**	**0.89%**	**0.85%**	**0.68%**	**1.57%**

Description: Based on the replication sample from 1993 to 2000, Table 10 presents market-adjusted buy-and-hold returns over the corresponding 3-, 20-, and 60-day periods beginning the day after the corresponding recommendation change. The return sign is designated positive (negative) if $ADJRET3_{it}$ is greater than or equal to (less than) zero. "Rec Change" represents the corresponding recommendation change that occurs the day after the large return event ends. Each "Difference" row provides tests of differences between the same categories across different return signs. Bold statistics indicate that two-tailed t-statistics are significant at the 5% level.

Interpretation: During the 1993 to 2000 replication period, negative price reactions following downgrades preceded by positive return events are mostly as strong as those following downgrades preceded by negative return events. This evidence does not support the idea that analysts' ability to predict price decreases explains the larger likelihood of analysts' making downgrades following large negative return events.

Table 11. Future Market-Adjusted Returns Following Recommendation Changes (1% Sample): Extension

			Post 3 Days		Post 20 Days		Post 60 Days	
Rec Change	Return Sign	Obs.	Mean	Median	Mean	Median	Mean	Median
Down ≤ -2	Negative	2,194	-0.43%	-0.47%	0.19%	-1.05%	**-2.03%**	**-2.93%**
	Positive	1,582	**-0.46%**	**-0.31%**	**-0.75%**	**-0.86%**	**-1.96%**	**-1.88%**
	Difference		0.03%	-0.16%	0.94%	-0.19%	-0.07%	-1.06%
Down -1	Negative	3,362	0.00%	-0.25%	-0.46%	**-0.96%**	**-2.40%**	**-3.10%**
	Positive	2,245	**-0.31%**	**-0.25%**	**-0.88%**	**-0.78%**	**-2.33%**	-1.34%
	Difference		0.31%	0.00%	0.42%	-0.18%	-0.07%	-1.77%
Up $+1$	Negative	1,860	**0.82%**	**0.40%**	0.44%	-0.21%	-0.69%	-0.33%
	Positive	1,563	0.13%	-0.08%	0.34%	-0.04%	0.73%	-0.20%
	Difference		**0.69%**	**0.49%**	0.09%	-0.16%	**-1.42%**	-0.13%
Up $\geq +2$	Negative	1,139	**0.66%**	0.35%	0.58%	-0.05%	-0.61%	-0.65%
	Positive	916	**0.50%**	**0.36%**	**1.15%**	0.38%	0.29%	-0.93%
	Difference		0.15%	0.00%	-0.57%	-0.43%	-0.89%	0.28%
Affirm	Negative	1,007	**0.72%**	0.36%	-0.15%	-0.57%	-1.15%	**-1.83%**
	Positive	752	0.46%	-0.16%	-0.41%	-1.06%	**-2.99%**	**-2.22%**
	Difference		0.26%	0.53%	0.26%	0.49%	1.84%	0.39%
No Change	Negative	533,251	**0.35%**	**0.09%**	**0.38%**	**-0.20%**	**-0.70%**	**-1.34%**
	Positive	471,757	**-0.16%**	**-0.21%**	**-0.36%**	**-0.58%**	**-1.19%**	**-1.71%**
	Difference		**0.51%**	**0.30%**	**0.75%**	**0.38%**	**0.49%**	**0.37%**

Description: Based on the replication sample from 2001 to 2019, Table 11 presents market-adjusted buy-and-hold returns over the corresponding 3-, 20-, and 60-day periods beginning the day after the corresponding recommendation change. The return sign is designated positive (negative) if $ADJRET3_{it}$ is greater than or equal to (less than) zero. "Rec Change" represents the corresponding recommendation change that occurs the day after the large return event ends. Each "Difference" row provides tests of differences between the same categories across different return signs. Bold statistics indicate that two-tailed t-statistics are significant at the 5% level.

Interpretation: During the 2001 to 2019 extension period, analysts' downgrades preceded by either positive or negative return events are followed by price reactions with smaller magnitudes than the negative price reactions following recommendation downgrades before 2000. Analysts' upgrades trigger significant returns in the 3-day window following major news.

Table 12. Ordered Probit Analysis of the Likelihood of Recommendation Change by Sample Periods and Earnings Announcement Events

Panel A1. Coefficient Summaries: from 1993 to 2000, following earnings announcements

	All Recommendations		Interior Recommendations	
Variable	Coefficient	z-Stat.	Coefficient	z-Stat.
$ADJRET3_{it}$	0.003	1.24	-0.018	-1.42
$NEGRET_{it} \times ADJRET3_{it}$	-0.091	-9.39	-0.016	-1.78
$ADJRET3_{it} + NEGRET_{it} \times ADJRET3_{it}$	-0.042	-9.55	-0.020	-3.96

Panel A2. Coefficient Summaries: from 1993 to 2000, not following earnings announcements

	All Recommendations		Interior Recommendations	
Variable	Coefficient	z-Stat.	Coefficient	z-Stat.
$ADJRET3_{it}$	0.027	6.52	-0.004	-0.44
$NEGRET_{it} \times ADJRET3_{it}$	-0.108	-19.00	-0.024	-3.92
$ADJRET3_{it} + NEGRET_{it} \times ADJRET3_{it}$	-0.035	-13.23	-0.015	-4.71

Panel B1. Coefficient Summaries: from 2001 to 2019, following earnings announcements

	All Recommendations		Interior Recommendations	
Variable	Coefficient	z-Stat.	Coefficient	z-Stat.
$ADJRET3_{it}$	0.014	4.37	0.002	1.03
$NEGRET_{it} \times ADJRET3_{it}$	-0.028	-6.85	0.000	-0.65
$ADJRET3_{it} + NEGRET_{it} \times ADJRET3_{it}$	-0.004	-1.90	0.001	0.81

Panel B2. Coefficient Summaries: from 2001 to 2019, not following earnings announcements

	All Recommendations		Interior Recommendations	
Variable	Coefficient	z-Stat.	Coefficient	z-Stat.
$ADJRET3_{it}$	0.040	15.25	0.017	8.42
$NEGRET_{it} \times ADJRET3_{it}$	-0.063	-17.69	-0.016	-6.81
$ADJRET3_{it} + NEGRET_{it} \times ADJRET3_{it}$	0.003	1.62	0.006	2.62

Description: Partitioned by the sample periods and whether recommendations are made in the 15 days following each earnings announcement, Table 12 presents selected results from the ordered probit regression of recommendation levels following three-day standardized returns within the ± 20 days surrounding returns in the 1% Sample defined in Table 1. Control variables are incorporated. We estimate five separate regressions corresponding to each lagged recommendation level and then calculate weighted average coefficient and z-statistic estimates utilizing the number of observations in each regression as the weights. The "All Recommendations" columns utilize all lagged recommendation levels to derive coefficient and significance estimates, whereas the "Interior Recommendations" columns utilize only lagged recommendation levels 2, 3, and 4. Reported results all correspond to the probability of being in the strong sell, sell, or hold recommendation categories. Z-statistics are in parentheses.

Interpretation: The main results are robust to the setting following earnings announcements.