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Changes in Analysts' Stock Recommendations Following Regulatory Action Against Their Brokerage

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Changes in Analysts' Stock Recommendations Following Regulatory Action Against Their Brokerage

Abstract: Despite the importance of sell-side analysts in the capital markets, we know little about the effectiveness of routine monitoring of the sell-side industry. We examine the attributes of sell-side research issued by analysts before and after their brokerage is subject to regulatory sanctions. We find that after a regulatory action, analysts at sanctioned brokerages lower their stock recommendations, both in absolute terms and relative to the recommendations of other analysts following the same firms. Following a regulatory action, analysts at sanctioned brokerages are also more likely than analysts at other brokerages to downgrade a company's stock after the receipt of unfavorable information about the firm. Importantly, we document that analysts at *non-sanctioned* brokerages also reduce the optimism in their stock recommendations when a peer analyst's brokerage is sanctioned, consistent with regulatory spillovers as a result of routine regulatory monitoring. Our study provides empirical evidence that regulatory action against sell-side brokerages is associated with a reduction in sell-side analysts' positive bias at both sanctioned and non-sanctioned brokerages.

Keywords: Analysts; sell-side; stock recommendations; FINRA; regulators

1. Introduction

Sell-side analysts play an important role in the capital markets by providing investors with industry knowledge, facilitating communication between investors and company management, and delivering research reports that summarize their assessments of firms' future prospects (Schipper 1991; Brown 1993; Brown, Call, Clement, and Sharp 2015). Although analysts serve these important purposes, many analysts—particularly those employed by brokerages offering underwriting or trading services—face conflicts of interest that potentially compromise the objectivity of their research (Mehran and Stulz 2007). In an effort to promote fair and transparent financial markets, Congress tasks the Financial Industry Regulatory Authority (FINRA) with creating and enforcing the rules that govern financial institutions, including sell-side brokerages. We examine the effect of routine monitoring of the sell-side industry on the stock recommendations of analysts employed by brokerages found to have violated these rules.

FINRA oversees a variety of securities regulations (e.g., net capital requirements, distribution of securities, supervision of securities employees) in an effort to promote investor protection and cultivate what it describes as "fair financial markets" for all market participants. Prior to 2007, each U.S. stock exchange, such as the National Association of Securities Dealers (NASD), individually operated enforcement divisions that regulated, monitored, and penalized financial institutions that violated securities regulations. We focus on regulatory actions specifically related to the research activities of sell-side analysts and their brokerages. We examine 81 violations of securities regulations related to sell-side research and imposed by FINRA and its predecessors from 1994 to 2014. These actions address issues such as inappropriate trading activity by analysts or members of their family, improper investment

banking influence over sell-side research, and inadequate or misleading disclosures in analyst reports. Unlike the Global Analyst Research Settlement in 2003, these regulatory actions are staggered in time and are the result of routine monitoring of sell-side brokerages.

Understanding whether routine monitoring of sell-side brokerages is associated with a change in analyst behavior is important in light of concerns about the objectivity of sell-side research. Specifically, many analysts face conflicts of interest that potentially bias their research and limit its usefulness to buy-side institutions (Brown, Call, Clement, and Sharp 2016), and these biases potentially put retail investors at a disadvantage. If analysts' behavior is unaffected by regulatory sanctions, the effectiveness of the regulatory structure over sell-side research could be called into question, heightening concerns about oversight of sell-side research.

There are several reasons to believe *ex ante* that we may not observe an association between regulatory actions and the properties of the published research produced by analysts at sanctioned brokerages. First, since 2007, the industry has been monitored by FINRA, which is a self-regulatory agency funded by the institutions it monitors. Hardy (2006) expresses concern "that the regulated institutions exercise excessive influence on the regulator" and "a captured regulator acts primarily in the interests of the regulatees, rather than in accordance with their putative mandate to promote the common good." Relatedly, Corwin, Larocque, and Stegemoller (2017) conclude that industry-wide SRO rules are "largely ineffective" at curbing analyst bias. Other critics have similarly questioned the effectiveness of FINRA as a regulator of the securities industry (Haigney 2011). Second, researchers examining regulators in other settings have sometimes failed to find evidence of changes in company behavior after regulatory enforcement actions. For example, after the Public Company Accounting Oversight Board sanctioned Deloitte in 2007 for violating various auditing standards, Deloitte exhibited no discernible improvement

in audit quality (Boone, Khurana, and Raman 2015). Therefore, it is not obvious that enforcement actions resulting from the routine monitoring of the sell-side industry will be associated with a change in the properties of analysts' research at sanctioned brokerages, particularly in light of the modest fines that accompany most of the actions in our sample.

We compare the stock recommendations of analysts in the year immediately before and the year immediately after their brokerage is targeted for a regulatory action. We predict that regulatory actions will reduce the optimistic bias in analysts' stock recommendations. We restrict our sample to stock recommendations issued by analysts employed at the same brokerage before and after the regulatory action and who issue recommendations for the same firm in both periods. We also control for other determinants of analysts' stock recommendations (e.g., prior stock returns, meeting or beating the market's expectations of earnings). Because we compare a common sample of analysts covering a common sample of firms, and because we measure stock recommendation bias relative to other analysts following the same firms in the same year, our research design allows us to speak directly to changes in analyst activity as a result of regulatory action.

We find that analysts' stock recommendations are less favorable, both in absolute terms and relative to other analysts following the same firms, in the year following a regulatory action, consistent with more conservative behavior from analysts at sanctioned brokerages. In practical terms, our findings suggest that, on average, approximately one in six stock recommendations is lower in the year following a regulatory action than in the year prior to the regulatory action (e.g., a "buy" rating instead of a "strong buy" rating, a "hold" rating instead of a "buy" rating). We note that these actions are distributed throughout our sample period; therefore, cross-

sectional or time-series clustering in analysts' stock recommendations is unlikely to explain our findings.

Investor demand for information from analysts is particularly strong shortly after earnings are announced (Yezegel 2015). As a result, we also examine how analysts at sanctioned brokerages react to negative earnings news following a sanction and compare it to the reaction of analysts at non-sanctioned brokerages to the same negative news. Specifically, we identify firms that fail to meet or beat the market's expectations of earnings and examine the likelihood that an analyst responds by downgrading the firm's stock, conditional on whether the analyst's brokerage was recently sanctioned. We predict that analysts whose brokerages were recently sanctioned will be more likely to downgrade their stock recommendations after a firm misses earnings expectations. Our findings are consistent with this prediction and suggest that analysts at sanctioned brokerages interpret firm-specific news with less optimistic bias than do analysts at non-sanctioned brokerages covering the same firms.

In additional analyses, we categorize the regulatory actions in our sample based on the types of violations committed by the brokerage. We categorize each violation into one or more of the following five categories: providing misleading information, conflicts of interest, sharing nonpublic information, concerns with the supervision of analysts, and other. We find that analysts whose brokerages were sanctioned for providing misleading information in their analyst reports issued more optimistic stock recommendations *prior* to the actions, on average, than other analysts. However, analysts at these brokerages significantly reduce their stock recommendations *after* the action, and analyst responses to regulatory actions for providing misleading information are greater than their reactions to all other types of violations. We also

find that analysts at sanctioned brokerages are more likely to downgrade their stock recommendations after their brokerage's first violation than after subsequent violations.

Prior research documents that revisions to analysts' stock recommendations elicit a meaningful capital market reaction (Francis and Soffer 1997; Bradley, Clarke, Lee, and Ornthanalai 2014), and we find that this reaction is unchanged for recommendation upgrades issued by analysts at sanctioned brokerages after a regulatory action. However, we observe a stronger market reaction to stock recommendation downgrades issued by these analysts following a regulatory action, suggesting that investors are aware of regulatory sanctions and believe downgrades issued by analysts at sanctioned brokerages become more credible following a regulatory action.

In our final test, we examine whether the tendency to lower their stock recommendations following a regulatory action extends to peer analysts from non-sanctioned brokerages who observe the routine monitoring of *other* brokerages. We identify peer analysts as those who are employed by a non-sanctioned brokerage and follow at least one of the firms covered by an analyst employed by a brokerage at the time it is subject to a regulatory action. We find that analysts at non-sanctioned brokerages also issue less favorable stock recommendations in the year following an action against a peer brokerage, although the reduction in stock recommendation optimism is not as large as it is for analysts at sanctioned brokerages. This finding is consistent with regulatory spillovers in the sell-side industry, and it suggests the effects of routine oversight of the financial industry extend beyond the specific brokerages formally sanctioned. Although recent research suggests that large, one-time regulatory events do not always impact peer analysts (Corwin et al. 2017), our finding that routine, ongoing monitoring is

associated with peer effects is consistent with the deterrence effects established in other literatures (e.g., Nagin 2013).

Our findings contribute to the literature in several ways. Considerable research has examined analysts' stock recommendations (Womack 1996; Barber, Lehavy, McNichols, and Trueman 2001; Jegadeesh and Kim 2006; Barber, Lehavy, and Trueman 2010; Li, Ramesh, Shen, and Wu 2015; Yezegel 2015), and frequently acknowledges the optimistic bias in sell-side research (Dugar and Nathan 1995; Hayes 1998; O'Brien, McNichols, and Lin 2005; Chen and Matsumoto 2006; Ramnath, Rock, and Shane 2008; Brown et al. 2016). Prior research speaks to various market-based mechanisms that discipline analysts' incentives to issue biased research, such as reputation (Fang and Yasuda 2009) and institutional ownership (Ljungqvist, Marston, Starks, Wei, and Yan 2007). Our study, however, examines another mechanism—regulatory oversight—that disciplines sell-side research, and finds that formal sanctions that result from routine oversight lead to less optimistic research from both the sanctioned brokerage's analysts and other analysts covering the same firms.

Our study also contributes to the literature on the impact of regulation on analyst behavior. Prior research documents that analysts' research is less informative following the passage of Regulation Fair Disclosure (Reg FD) (Gintschel and Markov 2004) and that NASD Rule 2711 enhanced analyst independence (Chen and Chen 2009). In addition, while Corwin et al. (2017) find that analysts at sanctioned brokerages reduced their optimistic bias following the 2003 Global Settlement, they find no evidence that analysts employed by brokerages not directly sanctioned by the Global Settlement changed their behavior. The authors note that "the limited impact on non-sanctioned banks suggests that industry-wide [self-regulatory organization] rules were largely ineffective at reducing the influence of investment banking on analyst research."

Our study contributes to this line of research by finding that (a) routine, ongoing industry-wide regulation is associated with a reduction in sell-side optimism, and (b) this effect extends beyond the sanctioned brokerages themselves. As such, our findings shed new light on the efficacy of regulatory oversight of sell-side research.

We acknowledge that we are unable to observe misconduct that goes undetected by regulators, and that even among the cases of discovered misconduct, imposing discipline on analysts' stock recommendations is not the only objective of regulatory oversight of the sell-side industry. As a result, our study cannot fully answer questions about the effectiveness of regulatory oversight of the sell-side industry. However, we argue that the observable consequences of these actions that we document are likely to be associated with other unobservable effects of regulatory scrutiny. Further, while analysts' stock recommendations are not the most important service sell-side analysts provide to institutional investors (Brown et al. 2016), their stock recommendations are likely more valuable to retail investors who, unlike institutional investors, do not employ their own research staff (Malmendier and Shanthikumar 2007). Given that one of the objectives of regulatory oversight is "to ensure that every investor receives the basic protections they deserve" (FINRA 2016), our findings speak directly to the effectiveness of regulators in achieving this goal.

2. Background and Hypothesis Development

2.1 Regulatory Oversight of Sell-Side Analysts

FINRA monitors and regulates the securities industry to ensure "investor protection and market integrity" (FINRA 2016). Prior to 2007, each U.S. stock exchange (Nasdaq, NYSE, and AMEX) individually operated enforcement divisions, such as the National Association of Securities Dealers (NASD), that regulated, monitored, and penalized financial institutions that

violated securities regulations. In 2007, the United States Congress authorized the Securities and Exchange Commission (SEC) to merge the stock exchanges' enforcement divisions to form FINRA, a self-regulating organization that oversees the securities industry, including almost 4,000 financial institutions and over 640,000 individuals.

FINRA is a member organization and requires financial institutions and their professionals to register and comply with industry rules and regulations of FINRA and the SEC. The rules and regulations include, but are not limited to, maintaining membership with FINRA, implementing and documenting organizational policies and procedures, and reporting and monitoring employee conflicts of interests. For example, FINRA established Rule 2711 to ensure sell-side analysts and their published reports are truthful and disclose all relevant information about a covered firm's securities (FINRA 2015). Rule 2711 also establishes rules to reduce conflicts of interest in the financial system. For instance, investment banking professionals are restricted from supervising research analysts or from determining analysts' compensation. Further, all communication between analysts and investment banking personnel must be documented and must occur in the presence of or through an authorized intermediary. Analysts are also allowed to provide drafts of their research reports to covered companies to verify the facts in the reports, but only if the reports do not contain the research summary, price target, or rating. Analysts are also restricted from trading securities in a manner that is inconsistent with their reports.

Other regulators, such as the SEC, also monitor the conduct of analysts and their brokerage firms and issue penalties when securities laws are violated. An example of a significant SEC action against brokerage firms for research-related activities is the Global Settlement. The Global Settlement was a result of inappropriate investment banking influence

over analysts that led to analysts publishing positive research to help secure investment banking services (Securities and Exchange Commission 2003). As a result, the SEC ordered ten of the largest financial institutions to pay fines totaling over $1 billion.

2.2 Prior Research

Prior research on the regulation of sell-side analysts focuses primarily on the impact of industry-wide regulation, such as Reg FD or NASD Rule 2711 (now FINRA Rule 2711), and other large-scale actions, such as the Global Settlement, on sell-side research. For example, Kadan, Madureira, Wang, and Zach (2009) find analyst recommendations are less biased following the Global Settlement, and Corwin et al. (2017) find the Global Settlement reduced optimistic bias in analysts employed by the targeted brokerages. Barber, Lehavy, McNichols, and Trueman (2006) find stock recommendations became less optimistic following the passage of NASD Rule 2711, and Chen and Chen (2009) find that analysts' stock recommendations exhibit a stronger relation with intrinsic value estimates and a weaker relation with conflicts of interest, following the passage of NASD Rule 2711. Other studies examine the information content of analyst research following the implementation of Reg FD, finding mixed evidence on the regulation's effectiveness in eliminating the private disclosure of material information. For example, Bailey, Li, Mao, and Zhong (2003) find analyst forecast dispersion increased following Reg FD, suggesting forecasting earnings became more difficult without access to material private information. Heflin, Sabramanyam, and Zhang (2003), however, find no change in forecast dispersion after Reg FD. Our study contributes to this literature by examining specific brokerages accused of violating regulatory statutes (rather than the effect of industry-wide implementation of new regulation) and the implications of the resulting sanctions for sell-side

research. Further, our study evaluates analyst reactions to a broad sample of sanctions that result from routine monitoring of sell-side brokerages.

Several studies also examine market-based channels through which sell-side research is disciplined. For example, Fang and Yasuda (2009) find that All-Star analysts are less likely to succumb to pressure to bias their research in an effort to secure underwriting revenue for their brokerage than are non-All-Stars, suggesting that reputation effects help discipline sell-side research. In addition, Mikhail, Walther, and Willis (1999) find that analysts who issue relatively more accurate earnings forecasts are less likely to lose their jobs, while Hong and Kubik (2003) find that forecast accuracy leads to promotions to more prestigious sell-side brokerages, suggesting that labor market concerns encourage analysts to publish high-quality research. Finally, Ljungqvist et al. (2007) document that the optimism in analysts' stock recommendations is declining in institutional ownership in the covered firm, suggesting that analysts have incentives to provide high-quality research to institutional clients.

Two other studies, Brown, Hugon, and Lu (2010) and Pacelli (2019), rely on data obtained from FINRA (or its predecessor, NASD). Brown et al. (2010) examine background disclosures about individual analysts provided by the NASD and examine the association between these disclosures and properties of analysts' earnings forecasts. These background disclosures are self-reported by the analysts, their brokerage firms, or a government agency, and include information about various aspects of the analyst's history, including criminal actions, personal bankruptcies, and loss of employment. Brown et al. (2010) find that analysts included in these background disclosures issue less accurate earnings forecasts that tend to elicit a weaker market reaction. Whereas Brown et al. (2010) examine associations between disclosures about analysts' backgrounds and properties of sell-side research, we examine changes in analyst

behavior following formal regulatory sanctions. Further, all the regulatory actions in our sample pertain to violations inside the research department of sell-side brokerages, while the disclosures examined by Brown et al. (2010) include information unrelated to sell-side research (e.g., personal bankruptcies).

Pacelli (2019) relies on FINRA data to investigate whether analyst forecast quality is lower among analysts employed by brokerages with a weak compliance culture and identifies brokerages as having a weak compliance culture if they have been accused by FINRA of violations in their *non-research* divisions. Pacelli (2019) documents lower forecast quality for analysts employed at institutions with securities violations in non-research activities, suggesting that a culture of misconduct in one department can permeate the organization. Our study is unique in that we examine (a) sanctions related directly to sell-side analysts and their research, and (b) *changes* in analyst behavior following FINRA sanctions. How analysts respond to regulatory sanctions against the research division of their brokerage is an open question that we address in our study.

2.3 Hypotheses

Prior research documents that analysts have many incentives to issue optimistically biased stock recommendations. For example, analysts whose brokerages provide investment banking services tend to issue more optimistic stock recommendations (Dugar and Nathan 1995; Lin and McNichols 1998) and are slower to downgrade their recommendations relative to other analysts (O'Brien et al. 2005). Further, analysts with ties to investment banking departments are more likely to release recommendation downgrades during times of low investor attention to maintain favorable relations with management (Rees, Sharp, and Wong 2017). Analysts also engage in strategic behaviors to gain access to management (Dugar and Nathan 1995; Ke and Yu

2006; Mayew 2008; Mayew, Sharp, and Venkatachalam 2013; Brown et al. 2015). Consistent with these incentives, Agrawal and Chen (2008) document that from 1994 to 2003, only 5.7% of sell-side analysts' stock recommendations were either "sell" or "strong sell."

Regulatory sanctions impose both direct and indirect costs on a brokerage and its analysts. For example, in our sample the median (mean) monetary fine against brokerages for analyst misconduct is $225,000 ($6.1 million), and some fines are as large as $200 million. In addition, analysts employed by sanctioned brokerages face possible reputational costs that could impair their credibility with their investing clients and the management of the companies they follow. For example, we found press coverage for 31 out of 81 sanctions in our sample (about 38 percent). Therefore, sanctioned brokerages likely face strong incentives to minimize the probability of another violation.

Further, prior research in other settings has demonstrated that companies and institutions respond to public scrutiny by changing personnel or practices. For example, Chakravarthy, deHaan, and Rajgopal (2014) find that companies subject to earnings restatements seek to repair the reputational capital by engaging in various corporate activities, such as restructuring the firm or revamping its internal controls, while Srinivasan (2005) finds that companies respond to restatements by replacing a large percentage of its directors (particularly members of the audit committee). Similarly, Dyreng, Hoopes, and Wilde (2016) find that companies respond to public scrutiny by providing additional disclosure and by reducing tax avoidance activity. Given the desire brokerages will have to repair any reputational damage associated with a regulatory violation, we predict that sanctioned brokerages will seek to minimize further regulatory attention and that their analysts will issue less optimistic research after their brokerage is sanctioned for violating a regulatory statute. We state our first hypothesis as follows:

H1: Analysts' stock recommendations are less optimistic following a research-related regulatory sanction against the analyst's brokerage.

In spite of our formal hypothesis and as noted above, there are several reasons why we may not observe an association between regulatory violations and properties of the published research issued by analysts employed at sanctioned brokerages. First, one concern in any regulated industry is the notion of regulatory capture, which is "the possibility that the regulated institutions exercise excessive influence on the regulator" and "a captured regulator acts primarily in the interests of the regulatees, rather than in accordance with their putative mandate to promote the common good" (Hardy 2006). Given that FINRA is a member organization funded by the institutions it monitors, we cannot rule out the possibility that FINRA (or its predecessors) is ineffective in curtailing the behavior of the analysts employed by the brokerages it sanctions. Second, some prior research has failed to find evidence of changes in company behavior after regulatory enforcement actions. Specifically, after the Public Company Accounting Oversight Board sanctioned Deloitte in 2007 for violating various auditing standards, Deloitte exhibited no discernible improvement in audit quality (Boone, Khurana, and Raman 2015). Therefore, it is not obvious that regulatory sanctions will be associated with a change in the properties of sell-side research issued by analysts at sanctioned brokerages.[1]

We also examine the reaction of analysts at sanctioned brokerages to negative information about the firms they cover. Prior research (Altinkiliç and Hansen 2009) documents that many analysts revise their stock recommendations shortly after earnings announcements, and Yezegel (2015) finds that this clustering is driven by greater demands for information from

[1] We also note that the frequency of an audit by FINRA is a function of the broker's size and business model (Pacelli 2019). The discovery of misconduct may be more likely at larger, more complex brokerages that are subject to a more frequent audit. However, it may be more difficult for a regulator to identify misconduct at a large, complex broker. Our tests do not model the probability of misconduct being discovered at a given brokerage, and instead take FINRA violations as given and examine the consequences of these sanctions.

investors after earnings are released. As a result, the activity of analysts at sanctioned brokerages immediately following earnings announcements provides a natural setting to examine the effect of regulatory oversight on analysts' stock recommendations. Given the regulatory spotlight on sanctioned brokerages, we predict that analysts at these brokerages will be less optimistically biased when interpreting negative firm news than analysts at non-sanctioned brokerages covering the same firms at the same time. Specifically, we predict that analysts employed by sanctioned brokerages are more likely than their non-sanctioned counterparts to downgrade their stock recommendations after firms announce negative earnings news.

H2: Analysts at sanctioned brokerages are more likely than analysts at non-sanctioned brokerages to downgrade their stock recommendations following a negative earnings surprise.

3. Sample and Research Design

3.1 Sample Selection

We identify research-related regulatory actions against brokerages from FINRA's BrokerCheck website (http://brokercheck.finra.org).[2] BrokerCheck provides a detailed report containing a summary of the institution's history and operations, along with a list of any pending or finalized regulatory actions against each financial institution operating within the United States. The report includes the date the action was initiated, the regulatory body that initiated the action, an explanation of the allegation, and a list of sanctions ordered against the brokerage. These actions could be a result of periodic examinations that determine the broker's adherence to the rules governing the financial industry or other exams based on information received through

[2] We obtain all of the regulatory actions in our sample through FINRA's BrokerCheck service, and most actions (72%) are initiated by FINRA or its predecessor. Other regulators, such as the Securities and Exchange Commission, initiate regulatory actions when securities laws are violated, and these violations are also included in BrokerCheck. For parsimony, we refer to all actions in our sample as regulatory actions by FINRA.

FINRA's Investor Complaint Center and Whistleblower Tip-Line. Brokers disclose regulatory actions and disciplinary events within 30 days of the event, and these disclosures are made when the firm is "the subject of a final regulatory action, convicted of or pled guilty or no contest to certain crimes, subject to a civil injunction…or found in a civil court to have been involved in a violation of investment-related statutes or regulations, or named as a respondent or defendant in an arbitration or civil litigation" (FINRA 2018).

We focus our analysis on regulatory actions specifically related to sell-side research. To identify these violations, we searched the description of each violation for the words "research" or "analyst." We then read the details of each action to ensure the actions relate to financial analysts and eliminated any unrelated action from our sample. We matched institution names associated with these violations in BrokerCheck to the brokerages listed in the IBES U.S. recommendations file.[3] In total, we collected information on 81 research-related regulatory sanctions from 1994 to 2014 filed against 50 brokerages covered by IBES. Appendix B contains a sample of research-related regulatory sanctions from FINRA BrokerCheck reports.

Table 1 provides information about the violations in our sample. In Panel A, we report the number of research-related sanctions in each year of our sample. Sanctions were relatively infrequent in the earliest years of our sample, with only three sanctions from 1994 through 1999. However, sanctions became more frequent and peaked from 2003 through 2006, with between eight and ten sanctions per year. In Panel B, we report that 36 of the 50 brokerages included in our sample were sanctioned only once during our sample period, with 14 brokerages sanctioned more than once.

[Insert Table 1 Here]

[3] The IBES recommendation file contains the analyst's first initial, last name, and an abbreviated name of the brokerage releasing the recommendation.

3.2 Violation Type

In Panel C of Table 1, we provide descriptive evidence on the nature of the violations in our sample. To identify the type of violation outlined in each action, two authors independently reviewed each sanction and categorized the violation into the following five types of violations, noting that many actions are associated with more than one type of violation:

MISLEAD – The analyst report contained misleading information.

COI – Conflicts of interest at the brokerage firm, including allegations related to investment banking activity, analyst compensation, and analyst trading activity.

NONPUB – The release of non-public information, including the release of a draft report to a covered company with inappropriate content included in the report or failure to disclose relevant information about analysts' public appearances.

SUPER – Inappropriate supervision of analysts, lack of adequate policies and procedures, lack of appropriate disclosure, and/or disclosures that contained errors.

OTHER – Other violations, such as the failure to comply with ongoing investigations against the brokerage and unregistered analysts issuing reports.

We find that 65 of the 81 violations in our sample include some mention of an issue with supervision or disclosure and that 46 include some type of conflict of interest (e.g., inappropriate communication with the brokerage's investment banking division, analyst trading against his/her research). Allegations of issuing misleading research are included in 12 of the violations. The regulatory actions outlined in Appendix B provide examples for each type of violation.

3.3 Research Design

Given that that regulators seek to promote a fair financial market for all investors, and because retail investors use sell-side analysts' recommendations to make investing decisions

(Cowen, Groysberg, and Healy 2006), we focus our attention on the stock recommendations analysts issue before and after a regulator sanction. For each analyst employed by a sanctioned brokerage, we identify the last stock recommendation issued for a firm prior to the date of a regulatory action, as well as the first stock recommendation issued after the regulatory action.[4] We require the analyst to have issued a stock recommendation for a given firm in the 365 days prior to the regulatory action and a stock recommendation for the same firm within 365 days after the regulatory action. This requirement creates balance in our sample and allows us to use the analyst as his/her own control, accounting for unobserved analyst characteristics that may be associated with properties of the analyst's stock recommendations. Further, this requirement ensures that we examine only stock recommendations issued within reasonable proximity to the regulatory event. Because we measure some of the variables in our model relative to other analysts following the same firms, we eliminate stock recommendations issued for firms with fewer than three analysts following the firm. We also eliminate any recommendation (and its associated pair) without requisite data for our model. Further, we require analysts to be employed by the same brokerage in both the pre-sanction and the post-sanction periods. Our final sample includes 11,354 recommendations issued by 1,256 analysts employed by 50 brokerages relating to 81 research-related regulatory actions.

We test our first hypotheses using the following model:

$$DV = \beta_0 + \beta_1 Post\_Action + \text{Controls} + \text{Year} + \text{Brokerage} + \varepsilon \qquad (1)$$

We employ three separate versions of the dependent variable to test H1. First, *SR* is equal to the recommendation level issued by the analyst, where "strong buy" is equal to 2, "buy" is

[4] FINRA's BrokerCheck website provides both the date that the regulatory action was initiated and the date that it was resolved. We focus on the date the regulatory action was initiated and examine the first stock recommendation issued after this date.

equal to 1, "hold" is equal to 0, "sell" is equal to -1, and "strong sell/underperform" is equal to -2.[5] Second, *Downgrade* is an indicator variable equal to one if the stock recommendation is lower than the analyst's previous stock recommendation, and equal to zero otherwise. Third, *SR_Rel* measures the analyst's stock recommendations relative to the consensus of all outstanding recommendations for the covered firm. More (less) optimistic stock recommendations are consistent with high (lower) values of *SR_Rel*. Thus, *SR_Rel* examines the stock recommendations issued by analysts employed by sanctioned brokerages *relative* to the stock recommendations for the same firms issued by analysts employed by non-sanctioned brokerages. We estimate an OLS regression when *SR* or *SR_Rel* is the dependent variable and logistic regression when *Downgrade* is the dependent variable.

Our variable of interest is *Post_Action*, which is a dichotomous variable equal to one if the stock recommendation was issued within 365 days following a regulatory action against the analyst's brokerage, and equal to zero if the stock recommendation was issued in the 365 days prior to the regulatory action. H1 predicts that analysts issue less optimistic stock recommendations following a regulatory action, and that the coefficient on *Post_Action* will be negative.

We control for several analyst and brokerage characteristics in our model, including the analyst's experience following the firm (*Firm_Exp*) and as a sell-side analyst (*Gen_Exp*), the number of firms the analyst follows (*Follow*), and the size of the analyst's brokerage (*Broker_Size*). These variables are standardized relative to the same characteristics for other analysts following the same firm in the same year (Clement and Tse 2003, 2005). We also control for the firm's stock price performance in the month prior to the recommendation

[5] We modify *SR* to create three recommendation level categories (buy, hold, and sell) and find similar results.

announcement (*Bhar*) and whether the firm meet or beat the consensus earnings forecast in the period prior to the recommendation announcement (*Meetbeat*). We also control for potential strategic behaviors that might be associated with the favorableness of an analyst's stock recommendation. For example, we control for the ability of the analyst's brokerage to underwrite debt or equity securities (*Underwriter*). All variables are defined in Appendix A, all regressions include year and brokerage fixed effects, and we cluster standard errors by analyst.

4. Empirical Results

4.1 Descriptive Statistics

Table 2, Panel A contains descriptive statistics for the 11,354 stock recommendations in our sample. The average stock recommendation has a value of 0.513 (*SR*), which is between a "buy" (1) and a "hold" (0) and is significantly greater than zero (untabulated *p*-value < 0.01) and consistent with the general optimistic bias in analysts' stock recommendations (Dugar and Nathan 1995; Lin and McNichols 1998; Michaely and Womack 1999; Brown et al. 2015). Approximately 38% of the stock recommendation revisions in our sample are downgrades (*Downgrade*). The average value of *SR_Rel* is -0.046 (untabulated *p*-value < 0.01). We also report descriptive statistics for the independent variables we use in Equation (1).

[Insert Table 2 Here]

In Panel B of Table 2, we report mean values of *SR, Downgrade,* and *SR_Rel*, separately for the stock recommendations issued before and after the action. The mean value of *SR* in the post-sanction period is 0.418, which is significantly lower than the mean of 0.607 in the pre-sanction period. In addition, analysts employed by sanctioned brokerages are more likely to downgrade their recommendations in the post-sanction period than in the pre-sanction period. Similarly, the mean value of *SR_Rel* in the pre-sanction period is 0.009, which is insignificantly

different from zero (*p*-value = 0.45, untabulated). However, the mean value of *SR_Rel* in the post-sanction period is -0.101, which is significantly lower than the mean of 0.009 in the pre-sanction period. These preliminary findings are consistent with H1, and suggest that prior to the regulatory action, analysts at sanctioned brokerages issued stock recommendations that were very similar to the mean stock recommendation issued by all other analysts, but that after the action, analysts at sanctioned brokerages issued less optimistic stock recommendations.

4.2 Regression Results

We report the results of our test of H1 in Table 3. In Column (1), we present the results of estimating Equation (1) when the dependent variable is *SR*. We find a significantly negative coefficient on *Post_Action* (-0.186, *p*-value < 0.01), consistent with analysts issuing less favorable stock recommendations in the year after their brokerage is sanctioned than in the year prior to the sanction. In practical terms, this coefficient suggests that, on average, approximately one out of six stock recommendations issued by analysts at sanctioned brokerages is one grade lower (i.e., "buy" instead of "strong buy," "hold" instead of "buy") following regulatory sanctions against their brokerage. The coefficients on the control variables suggest that stock recommendations are generally more favorable if the firm recently met or exceeded earnings expectations (*Meetbeat*), or if the analyst's brokerage provides underwriting services (*Underwriter*).

[Insert Table 3 Here]

In Column (2), we estimate a logistic regression where the dependent variable is a dichotomous variable equal to one if the analyst's stock recommendation revision is a downgrade of the company's stock, and equal to zero if the revision is a reiteration or an upgrade. We test whether analysts are more likely to downgrade the company's stock in the

period immediately following regulatory sanctions than in the period immediately prior to regulatory sanctions. This model mirrors Equation (1), except (a) it is a logistic regression rather than an OLS regression, (b) we eliminate observations where the analyst's prior stock recommendation was *Underperform*, because these recommendations cannot be downgraded, and (c) we include three additional control variables (*StrongBuy*, *Buy*, and *Sell*) to control for the level of the analyst's prior stock recommendation. As outlined in Column (2), we find that analysts are more likely to downgrade their stock recommendations in the period immediately following regulatory sanctions against their brokerage than in the period prior to the sanction.[6] The coefficient on several control variables is consistent with intuition. For example, analysts with considerable experience covering the firm (*Firm_Exp*) are less likely to downgrade the company's stock. In addition, analysts with a sell (buy) rating are less (more) likely to issue a downgrade.[7]

One possible concern with the results presented in Columns (1) and (2) of Table 3 is that we do not control for firm news that might be associated with analysts' stock recommendations. For example, if the covered firms are systematically more likely to face bad news in the post-sanction period than in the pre-sanction period, one would expect analysts to issue less favorable stock recommendations at that time for reasons unrelated to the brokerage's recent sanction. However, we note that the sanctions we examine are scattered throughout our sample period, such that the post-sanction period for one sanction often precedes the pre-sanction period for

[6] Logistic regression containing numerous fixed effects have the potential for bias in the estimated coefficients (Greene 2004). We re-estimate our tests of the likelihood of a downgrade using an OLS regression and our inferences are the same.

[7] In untabulated results, we also find that in the year following FINRA events, analysts at sanctioned brokerages issue less optimistically biased (and more accurate) earnings and target price forecasts.

other sanctions.[8] Further, while we argue that regulatory actions are important events for analysts employed by the sanctioned brokerages, there is little reason to expect a regulatory action against an individual brokerage (and not against the firm the analyst is covering or against other brokerages employing analysts covering the firm) to be systematically associated with firm-specific news that would lead analysts to change their assessment of the company or its stock.

Nevertheless, to more fully rule out alternative explanations for our results, in Column (3) we estimate Equation (1) where the dependent variable is *SR_Rel*, which is measured as the analyst's stock recommendation level less the consensus recommendation level for all analysts following the firm. Because this variable measures the analyst's stock recommendation relative to other analysts following the same firm at the same time, it holds constant any news that might otherwise be associated with the analysts' views of the firm. When we estimate this model using *SR_Rel* as the dependent variable, the coefficient on *Post_Action* is significantly negative (-0.112, p-value < 0.01), consistent with the notion that analysts issue less favorable stock recommendations following sanctions against their brokerage, even relative to other analysts following the same stock.[9] In general, the results presented in Tables 2 and 3 are consistent with H1.[10]

[8] Relatedly, a stock recommendation in the pre-sanction period for one analyst may coincide with a stock recommendation in the post-sanction period for a different analyst covering the same firm but employed by a different brokerage.

[9] Kadan et al. (2009) conduct a thorough examination of the Global Settlement and other regulations on analysts' stock recommendations, and note that following these regulations most brokerages migrated from a 5-tier to a 3-tier rating system. In our tests we employ the same system used by the brokerage at the time the analyst issued the forecast, noting that our inferences are robust to the use of a 3-tier (rather than 5-tier) recommendation rating system throughout.

[10] We find no difference in behavior following FINRA violations based on the size of the sanctioned brokerage, suggesting that the effect we document is not limited to only analysts employed by small brokerages. We note, however, that the analysts at sanctioned brokerages who were most optimistic prior to the sanction are associated with the largest reductions in stock recommendation optimism following the sanction.

We note that some of the sanctions in our sample are related to the Global Settlement. Because Corwin et al. (2017) offer a thorough investigation of the behavior of analysts employed by banks included in the Global Settlement, and to ensure that these sanctions do not drive our results, we re-estimate Equation (1) using a sample of sanctions not related to the Global Settlement. To identify sanctions related to the Global Settlement, we read the allegation and sanction detail in BrokerCheck for each financial institution included in the Global Settlement. We match the description of the allegation and the fines paid to those described in the Global Settlement, and in many cases the sanction specifically refers to the Global Settlement. In untabulated tests, we find that the results are consistent with those presented in Table 3. To further alleviate concerns that our findings are driven by the Global Settlement and its impact on the brokerage industry, we also (a) omit all violations from 2003 and 2004, and (b) only examine violations from 1994 through 2002 that unambiguously pre-date the Global Settlement. We find similar results (untabulated) in both tests.

4.3 Stock Recommendations Following Earnings Misses

In Table 4, we present the results of our test of H2. Specifically, following an announcement of negative news by covered firms, we compare the likelihood that analysts employed by sanctioned brokerages downgrade their stock recommendations with the likelihood that analysts at non-sanctioned brokerages downgrade their recommendations for the same firms.

[Insert Table 4 Here]

We identify all firms covered by analysts at sanctioned brokerages at the time of the regulatory action and focus on the first stock recommendation following the action issued by an analyst from a sanctioned brokerage. We retain only stock recommendations that are preceded by an earnings miss (i.e., reported earnings below analysts' consensus estimate) in order to isolate

analysts' response to negative firm news. In addition, we only include analysts at non-sanctioned brokerages in this analysis if their prior stock recommendation (before the earnings announcement) was the same as the prior stock recommendation of the analyst at a sanctioned brokerage. This requirement ensures that we compare the likelihood of downgrading the firm's stock across analysts with similar assessments of the stock prior to the earnings miss. Lastly, we consider only stock recommendations issued prior to the subsequent earnings announcement. To formally test H2, we estimate the following logistic regression:

$$Downgrade = \beta_0 + \beta_1 Sanctioned\_Analyst + \text{Controls} + \text{Brokerage} + \varepsilon \qquad (2)$$

Sanctioned_Analyst is an indicator variable equal to one for analysts employed by a sanctioned brokerage, and equal to zero otherwise. The control variables in Equation (2) are identical to those employed in Equation (1), except we no longer control for *Meetbeat* given that all stock recommendations follow earnings misses, by design, or the analyst's prior stock recommendation level, given that analysts at non-sanctioned brokerages are included in the analysis only if their prior recommendation level is identical to that of an analyst at a sanctioned brokerage who covers the same firm.[11] H2 predicts that the coefficient on *Sanctioned_Analyst* will be positive, consistent with analysts at sanctioned brokerages being more likely to downgrade (as opposed to upgrade or reiterate) their stock recommendations following earnings misses than are analysts at non-sanctioned brokerages.

Consistent with H2, the positive and significant coefficient for *Sanctioned_Analysts* (0.394, *p*-value = 0.01) in Table 4 indicates that analysts at sanctioned brokerages are 1.48 times more likely than analysts at non-sanctioned brokerages to downgrade their stock

[11] We also omit year fixed effects because all stock recommendations issued by the analysts at sanctioned brokerages and by the corresponding analysts at non-sanctioned brokerages are issued within 90 days of the same earnings announcement. However, we note that our findings are robust to the inclusion of year fixed effects.

recommendations following the announcement of negative firm news. This result is also consistent with the results in Table 3 that suggest analysts employed by sanctioned brokerages respond by reducing the optimism in their stock recommendations.

4.4 Cross-Sectional Variation Based on Violations for Issuing Misleading Research

As discussed in Section 3.2, we classify each regulatory action into one or more of five different categories based on the description of the nature of the brokerage's violation. Given that our dependent variables focus on analysts' research output (stock recommendation optimism) before and after the sanction, we examine whether our findings are more pronounced for violations related to the issuance of misleading research than following other types of regulatory actions.[12] We modify Equation (1) to separately examine the association between regulatory actions for issuing misleading research and analysts' subsequent stock recommendations and present the results in Table 5.

[Insert Table 5 Here]

In Column (1), the coefficient on *Post_Action* remains negative and significant (-0.145, *p*-value < 0.01), suggesting that, on average, violations unrelated to the issuance of misleading research are associated with decreases in stock recommendation levels. Importantly, we also find a significantly negative coefficient on *MISLEAD*Post_Action* (-0.305, *p*-value < 0.01), which suggests that the reduction in the favorableness of analysts' stock recommendation following regulatory actions is even greater among analysts employed by brokerages sanctioned for issuing misleading research. We find similar results in Column (2) when we use *Downgrade* as the dependent variable and in Column (3) when *SR_Rel* is the dependent variable. Specifically, the

[12] We note that many violations classified as being associated with the issuance of misleading research also include other types of violations (e.g., conflicts of interest associated with investment banking activity). See Appendix B for specific examples.

coefficient on *Post_Action* in Column (2) is significantly positive (0.033, p-value < 0.01) and the coefficient on *MISLEAD*Post_Action* is also significantly positive (0.210, *p*-value < 0.01). In Column (3), the coefficient on *Post_Action* is significantly negative (-0.075, *p*-value < 0.01) and the coefficient on *MISLEAD*Post_Action* is also significantly negative (-0.270, *p*-value < 0.01).

These results provide important evidence of the effect of regulatory sanctions on analyst research. While we find that sanctions arising from misconduct directly related to analyst research (i.e., misleading research) are associated with subsequent stock recommendation changes, even other sanctions that are less directly related to analysts' published research are followed by meaningful reductions in stock recommendation levels. These findings suggest that regulators' routine monitoring of the brokerage industry induces changes in analyst behavior.

4.5 Recidivist Violators

As outlined in Panel B of Table 1, some brokerages are repeat offenders, having been subject to more than one regulatory action during our sample period. We examine whether the association between regulatory actions and subsequent stock recommendations differs between first-time and recidivist offenders. To address this question, we modify Equation (1), as follows:

$$DV = \beta_0 + \beta_1 Post\_Action + \beta_2 Recidivist + \beta_3 Post\_Action*Recidivist + \text{Controls} + \text{Year} + \text{Brokerage} + \varepsilon \quad (3)$$

Recidivist is an indicator variable equal to one if the analyst's brokerage was previously sanctioned for analyst misconduct within our sample period, and equal to zero otherwise. The control variables in Equation (3) are identical to those employed in Equation (1). If analysts at sanctioned brokerages are more (less) likely to reduce the optimism in their stock recommendations following a subsequent violation, the coefficient on *Post_Action*Recidivist* will be negative (positive).

As outlined in Table 6, we find that the main effect on *Post_Action* in Column (1) is significantly negative (-0.327, *p*-value < 0.01), consistent with the notion that analysts' stock recommendations become less optimistic following sanctions against their brokerage (H1). The coefficient on *Post_Action*Recividist*, however, is significantly positive (0.240, *p*-value < 0.01), suggesting that analysts at sanctioned brokerages are less likely to rein in their stock recommendations following recidivist sanctions. We find similar results in Columns (2) and (3).

[Insert Table 6 Here]

4.6 Market Reaction to Stock Recommendations Following Sanctions

Prior research finds that revisions to analysts' stock recommendations are associated with meaningful stock returns for the covered firm (Francis and Soffer 1997; Bradley et al. 2014). We examine the impact of these violations on the market reaction to stock recommendation revisions issued by analysts employed by analysts at sanctioned brokerages. Specifically, we estimate the following regression:

$$Ret = \beta_0 + \beta_1 Post\_Action + \beta_2 Upgrade + \beta_3 Post\_Action*Upgrade + \text{Controls} + \text{Year} + \text{Brokerage} + \varepsilon \quad (4)$$

Ret is the three-day abnormal return (-1, +1) centered on the date of the stock recommendation revision. For reiterated or downgraded recommendations, we multiply *Ret* by negative one, which allows us to test the informativeness of all recommendation levels in the same regression based on the expected market reaction to the recommendation. We include an indicator variable, *Upgrade*, to separately examine the market reaction to upgrades vs. downgrades and reiterations following regulatory actions. Specifically, the coefficient on *Post_Action* reflects the difference in the market reaction to downgrades and reiterations issued by sanctioned following a regulatory event, and the coefficient on *Post_Action*Upgrade* captures the incremental

difference in the market reaction to upgrades issued by analysts at sanctioned brokerages after a regulatory event. We control for the analyst's experience following the firm in question (*Firm_Exp*), the number of firms the analyst follows (*Follow*), the number of analysts following the firm (*Analyst_Count*), brokerage size (*Broker_Size*), and indicator variables equal to one if the firm announces earnings (*EA*) or some other analyst issues a stock recommendation (*Other_SR*) in the same return accumulation period, and zero otherwise. We also include year and brokerage fixed effects and report the results in Table 7.

[Insert Table 7 Here]

We find a positive and significant coefficient on *Post_Action* (0.005, *p*-value < 0.01), suggesting that downgrades and reiterations to stock recommendations issued by analysts at sanctioned brokerages elicit a stronger market reaction after a regulatory event than before. We also find a negative and significant coefficient on *Post_Action*Upgrade* (-0.006, *p*-value < 0.05), which suggests that after a regulatory event, upgrades are less informative and met with more skepticism than are downgrades and reiterations.[13] In general, our findings are consistent with investors believing that downgrades (but not upgrades) issued by analysts at sanctioned brokerages are more credible following a regulatory action.

5. Spillover Effects of Regulatory Actions

Corwin et al. (2017) find that analysts employed by brokerages included in the 2003 Global Settlement reduced their optimistic bias, but they find no evidence of a reduction in optimistic bias among analysts employed by other brokerages not included in the Global Settlement and conclude that "industry-wide [self-regulatory organization] rules were largely ineffective at reducing the influence of investment banking on analyst research." Motivated by

[13] The combined effect of *Post_Action* and *Post_Action*Upgrade* is not statistically different from zero (*p*-value = 0.611).

Corwin et al. (2017) and the importance of understanding the extent to which routine monitoring shapes sell-side research, in this section we examine the stock recommendation optimism of peer analysts at non-sanctioned brokerages following regulatory sanctions.

To examine this issue, we augment our sample by including stock recommendations issued by analysts at both sanctioned and non-sanctioned brokerages following a given firm at the same time. We focus on analysts at non-sanctioned brokerages following the same firms as analysts at sanctioned brokerages in order to hold constant the information both groups of analysts are responding to when issuing their stock recommendations and to facilitate comparisons between both groups of analysts. In addition, a regulatory action against a different brokerage is likely more salient to an analyst at a non-sanctioned brokerage if it impacts a peer analyst. Similar to the design of our main test, the analysts at non-sanctioned brokerages included in this analysis must issue at least one stock recommendation for the firm in the 365 days before the corresponding action and also within 365 days after the action. We retain the last recommendation issued before and the first recommendation issued after the regulatory action. We include only firms with at least one analyst at a sanctioned brokerage and at least one analyst at a non-sanctioned brokerage in both the pre- and post-action periods. Therefore, this analysis includes 42,068 individual stock recommendations issued for a total of 16,639 firm-year observations (out of a possible 83,801 firm-year observations during our sample period).

We modify Equation (1) by adding *Sanctioned_Analyst*, as well as its interaction with *Post_Action*, as follows:

$$SR = \beta_0 + \beta_1 Post\_Action + \beta_2 Sanctioned\_Analyst + \beta_3 Post\_Action*Sanctioned\_Analyst + \text{Controls} + \text{Year} + \text{Brokerage} + \varepsilon \quad (5)$$

A negative coefficient on *Post_Action* would suggest the effects of regulatory actions spill over to other analysts employed by non-sanctioned brokerages. Given our main results, we expect the regulatory action to have a larger effect on analysts at sanctioned brokerages than those at non-sanctioned brokerages; thus, we expect a negative coefficient on the interaction between *Post_Action* and *Sanctioned_Analysts*.

[Insert Table 8 Here]

In Panel A of Table 8, we present univariate evidence and find that the average pre-action recommendation is significantly higher for analysts at sanctioned brokerages (0.614) than for analysts at non-sanctioned brokerages (0.579). However, for both groups of analysts, the average post-action recommendation is lower than the average pre-action recommendation, and the difference in the average post-action recommendation is not significantly different between analysts at sanctioned and non-sanctioned brokerages (0.431 and 0.420, respectively). These statistics provide initial evidence that regulatory actions lead to reductions in recommendation optimism that extend beyond the sanctioned brokerages.

We present the results of estimating Equation (5) in Panel B of Table 8. In Column (1) we find a negative coefficient on *Post_Action* (-0.101, *p*-value < 0.01), suggesting analysts at non-sanctioned brokerages decrease their stock recommendation levels following the sanction of a peer analyst's brokerage. We also find a negative and significant coefficient on the interaction between *Post_Action* and *Sanctioned_Analyst* (-0.047, *p*-value < 0.10), suggesting an incremental reduction in stock recommendation optimism among analysts at sanctioned brokerages. These results provide evidence that routine monitoring of the sell-side industry constrains optimism in analyst research even when an analyst's brokerage is not directly

targeted.[14] In Column (2) we add *MISLEAD* along with its interactions with *Post_Action* and *Sanctioned_Analyst* and find that the spillover effects we document are driven primarily by sanctions against brokerages for having issued misleading research.

One question that naturally emerges is why regulatory spillovers were not apparent following the Global Settlement (Corwin et al. 2017), when they are evident in our sample of routine regulatory actions. Research in criminology suggests that the *certainty* of punishment is far more likely to deter misbehavior than is the *severity* of the potential punishment (Nagin 2013). Our finding that regular, routine monitoring of sell-side brokerages has spillover effects to peer analysts is consistent with this intuition.

We note that our tests do not allow us to determine whether these spillovers are the result of efforts by analysts at non-sanctioned brokerages to avoid regulatory scrutiny or by analysts at non-sanctioned brokerages—potentially unaware of the regulatory action—observing the less favorable stock recommendations issued by analysts at sanctioned brokerages and "herding" in response to these revised recommendations. Nevertheless, regardless of the motivation for it, the end result is that regulatory actions lead to less optimistically biased stock recommendations issued by both analysts at sanctioned and non-sanctioned brokerages, consistent with the goal of enhancing investor protection and encouraging a level playing field for all investors.

6. Conclusion

Because sell-side analysts play an important role in the capital markets, their activities are monitored by regulators, including the Financial Industry Regulatory Authority (FINRA). We

[14] These results should not be interpreted to mean that all analysts lower their stock recommendations for all firms they follow after a regulatory action against one brokerage. Importantly, this analysis focuses only on the subset of firms followed by analysts at a sanctioned brokerage. The majority of covered firms are not included in this analysis, and analysts are much less likely to revise their stock recommendations for those firms in response to these regulatory actions.

examine a sample of 81 regulatory actions against sell-side brokerages from 1994 to 2014 to examine the impact of these sanctions on the research activities of the analysts they employ. We find that the stock recommendations analysts issue immediately after their brokerage is sanctioned are less optimistic than (a) the stock recommendations the same analysts issued for the same firms immediately prior to the regulatory action, and (b) the stock recommendations issued by other (non-sanctioned) analysts covering the same firms. This result is particularly pronounced for analysts employed by brokerages sanctioned for having issued misleading research to investors. We find that peer analysts at non-sanctioned brokerages also issue less optimistic recommendations following sanctions against other brokerages, consistent with regulatory spillovers to routine oversight of sell-side research. In general, our findings suggest that regulatory oversight helps mitigate some of the optimistic bias inherent in sell-side analysts' stock recommendations (Agrawal and Chen 2008).

We also examine how analysts employed by sanctioned brokerages respond to negative news about the firms they cover. Relative to analysts at non-sanctioned brokerages following the same firms, we find that analysts employed by brokerages recently sanctioned are more likely to downgrade the firm's stock following a negative earnings surprise. Given the salience of earnings announcements and analysts' importance in helping investors process earnings news, this finding speaks to the important role of routine oversight of sell-side research. We also find that the market reaction to downgrades issued by analysts at sanctioned brokerages is stronger following regulatory sanctions, but we do not find the same result for upgrades.

Although we focus on properties of analysts' stock recommendations, we acknowledge that sell-side analysts provide other important services and that regulators' ability to effectively monitor sell-side brokerages goes beyond imposing discipline on sell-side research. However,

we argue that the observable consequences of regulatory sanctions that we document suggest that regulators impose discipline on the sell-side industry in other, unobservable ways. As a result, our findings speak to the effectiveness of regulatory oversight of the sell-side industry.

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Appendix A
Variable Definitions

Variable	Definition
Dependent Variables	
SR	The analyst's recommendation level, where strong buy is equal to 2, buy is equal to 1, hold is equal to 0, sell is equal to -1, and underperform is equal to -2.
Downgrade	Equal to one if the recommendation level is lower than the analyst's previous recommendation level for the covered firm, and zero otherwise.
SR_Rel	The analyst's recommendation level minus the consensus recommendation issued for the firm.
Ret	Three-day abnormal return (-1,+1) centered on the date of the stock recommendation revision, with the abnormal return is multiplied by -1 for reiterated and downgraded recommendations.
Independent Variables (in alphabetical order)	
Analyst_Count	The number of analysts following the covered firm.
Bhar	The covered firm's buy and hold abnormal returns in the month prior to the stock recommendation (target price, earnings forecast).
Broker_Size	The number of analysts employed by the analyst's brokerage minus the minimum number of analysts employed by brokerages for analysts following the same firm in the same year, scaled by the range of brokerage size for all analysts following the firm that year (Clement and Tse 2003, 2005).
Buy	Equal to one if the analyst's prior recommendation was a buy rating, and zero otherwise.
COI	Equal to one if the stock recommendation was issued within 365 days before or after a sanction was initiated against the analyst's brokerage related to conflict of interest, analyst compensation, investment banking, and/or analyst trading violations, and zero otherwise.
Consensus	The average outstanding stock recommendation level issued by other analysts as of the date the analyst in question issues her stock recommendation.
EA	Equal to one if the covered firm announced earnings during the return accumulation period, and zero otherwise.
Fine	The monetary fine included in the sanction.
Follow	The number of companies the analyst follows minus the minimum number of companies followed by analysts who follow the same firm in the same year, scaled by the range in the number of companies followed by analysts following the firm that year (Clement and Tse 2003, 2005).

Appendix A (continued)
Variable Definitions

Gen_Exp	The number of years of experience the analyst has minus the minimum number of years of experience for analysts following the same firm in the same year, scaled by the range of years of experience for analysts following firm the firm that year (Clement and Tse 2005).
Meetbeat	Equal to one if the firm met or beat the consensus earnings forecast in the prior fiscal period, and zero otherwise.
MISLEAD	Equal to one if the stock recommendation was issued within 365 days before or after a sanction was initiated against the analyst's brokerage related to misleading information, and zero otherwise.
NONPUB	Equal to one if the stock recommendation was issued within 365 days before or after a sanction was initiated against the analyst's brokerage related to inappropriate distribution of draft reports, nonpublic information, and/or the failure to manage analyst public appearances, and zero otherwise.
OTHER	Equal to one if the stock recommendation was issued within 365 days before or after a sanction was initiated against the analyst's brokerage related to brokerages failure to comply with ongoing investigations and/or actions related to unregistered individuals, and zero otherwise.
Other_SR	Equal to one if another analyst issued a stock recommendation for the covered firm during the return accumulation period, and zero otherwise.
Post_Action	Equal to one if the stock recommendation was issued within 365 days following a regulatory action against the analyst's brokerage, and zero otherwise.
Recidivist	Equal to one if the analyst's brokerage was previously sanctioned for analyst misconduct, and zero otherwise.
Sanctioned_Analyst	Equal to one if the analyst is employed by a sanctioned brokerage, and zero otherwise.
Sell	Equal to one if the analyst's prior recommendation was a sell rating, and zero otherwise.
StrongBuy	Equal to one if the analyst's prior recommendation was a strong buy rating, and zero otherwise.
SUPER	Equal to one if the stock recommendation was issued within 365 days before or after a sanction was initiated against the analyst's brokerage related to failure to adequately supervise analysts and/or failure to include require disclosures in analyst research reports, and zero otherwise.
Underperform	Equal to one if the analyst's prior recommendation was an underperform rating, and zero otherwise.
Underwriter	Equal to one if the analyst is employed by a brokerage affiliated with an investment banking department, and zero otherwise.

Appendix A (continued)
Variable Definitions

Upgrade	Equal to one if the recommendation level is higher than the analyst's previous recommendation level for the covered firm, and zero otherwise.

Appendix B
Examples of Research-Related Regulatory Actions

Example 1

Brokerage	Piper Jaffray
Date Initiated	6/25/2002
Allegations	NASD Rule 2110 - without admitting or denying the allegations, the respondent member consented to the entry of findings that it inappropriately threatened to drop research coverage and to stop making a market in a stock if the firm was not selected as lead underwriter for a secondary offering. These threats were made in an attempt to force the issuer to engage in business on terms favorable to the firm but were not wanted by the issuer.
Sanctions	Censured and fined $250,000
Violation Categories	COI

Example 2

Brokerage	Sidoti & Company LLC
Date Initiated	7/18/2007
Allegations	NASD rule 2110 and 2711(c): between September 2, 2004 and July 17, 2006, the firm sent draft research reports to approximately 200 subject companies prior to publication that contained analyst analyses, estimates, projections and conclusions. One of those research reports contained a price target and research rating.
Sanctions	Without admitting or denying the findings, the firm consented to the described sanctions and to the entry of findings; therefore the firm is censured and fined $25,000.
Violation Categories	*NONPUB*

Example 3

Brokerage	Friedman, Billings, Ramsey & Co.
Date Initiated	10/17/2006
Allegations	Respondent failed to enforce its written supervisory procedures relating to securities transactions by its research analysts and other associated persons that required the firm's compliance department to obtain duplicate confirmations and statements for all securities accounts maintained by those individuals at other firms. Moreover, the compliance department had to review those outside account records on at least a quarterly basis. It failed to detect and prevent violations of NASD rules 2711, 3050 and 2110 by the research analyst.
Sanctions	Censured and fined $15,000.
Violation Categories	*SUPER, COI*

Appendix B (continued)
Examples of Research-Related Regulatory Actions

Example 4

Brokerage	Feltl & Company
Date Initiated	7/19/2006
Allegations	Respondent member failed to adopt and implement written supervisory procedures reasonably designed to achieve compliance concerning research reports. The findings stated that the firm published research reports that contained misleading statements.
Sanctions	Censured and fined $10,000
Violation Categories	*MISLEAD, SUPER*

Example 5

Brokerage	Morgan Stanley
Date Initiated	12/11/2014
Allegations	The findings stated that the firm's research analyst presented to the company and its private equity owners (sponsors), during the solicitation period, thereby participating in the firm's efforts to solicit investment banking business from the company. The firm offered favorable research to induce the company to award the firm its investment banking business. Following the analyst's presentation, the company asked the firm to complete a template showing an "equity commitment committee approv[ed]" valuation of the company, which would include the analyst's views on the company's valuation. The company and its sponsors asked the firm to complete the template and provide a firm-wide valuation that the firm, including its analyst, would be expected to support after the company awarded its initial public offering (ipo) business, absent unexpected developments. Indeed, the company told some firms that the purpose of the template was to prevent the company from being "burned" by an analyst's decision to adopt a negative view of the company after the company had awarded its investment banking business to the analyst's firm. The firm complied with the company's request for a valuation that included that analyst's views. Under the circumstances of the company's ipo, the firm offered favorable research coverage to induce receipt of investment banking business by completing and submitting to the company, during the solicitation period, a valuation template requested by the company and the sponsors. The firm understood that the company and the sponsors wanted a final valuation that the entire firm, including its analyst, would support if selected as an underwriter. By providing the company the unified valuation it sought, the firm indicated to the company that post-ipo research coverage would be positive and aligned with investment banking. The company and the sponsors selected the firm as a co-manager for the company's ipo. The firm declined to participate. The company eventually decided not to proceed with the offering.
Sanctions	Censured and fined $4,000,000
Violation Categories	*MISLEAD, COI*

Appendix B (continued)
Examples of Research-Related Regulatory Actions

Example 6

Brokerage	Suntrust Robinson Humphrey
Date Initiated	5/4/2005
Allegations	Failed to apply for the research designation for 48 research analysts. Suntrust research analysts continued to act as research analysts without passing the research analyst qualification examination. When suntrust discovered the failure to submit the registration applications, the firm issued 438 research reports and updates. Suntrust knew that its research analysts were not properly registered, but it issued an additional 202 research reports and updates.
Sanctions	Censured and fined $100,000
Violation Categories	*OTHER*

Table 1
Sample of Research-Related Regulatory Sanctions

Panel A: Sanctions By Year

Year	Number of Sanctions
1994	1
1996	2
2000	1
2001	2
2002	3
2003	10
2004	10
2005	8
2006	9
2007	4
2008	5
2009	3
2010	3
2011	7
2012	4
2013	2
2014	7
Total Sanctions	81

Panel B: Number of Brokerages By Sanction Frequency

Sanction Frequency	Number of Brokerages
1	36
2	9
3	2
4+	3

Table 1 (continued)
Sample of Research-Related Regulatory Sanctions

Panel C: Number of Sanctions by Type of Violation

Major Sanction Category Specific Sanction Category	Number of Sanctions	Number of Related Stock Recommendations in the Year Before or After
Misleading Research (MISLEAD)		
Misleading information in analyst report	12	1,498
Total unique sanctions	12	
Conflicts of Interest (COI)		
Conflicts of interest	34	
Analyst compensation	9	
Investment banking	22	
Analyst trading	15	
Total unique sanctions	46	7,922
Non-public Information (NONPUB)		
Provided inappropriate draft report to company	5	
Release of non-public information	10	
Disclosure of public appearances	3	
Total unique sanctions	18	2,350
Supervision (SUPER)		
Inappropriate supervision	48	
Inappropriate disclosure	37	
Total unique sanctions	65	8,364
Other Violations (OTHER)		
Failure to comply with ongoing investigation	3	
Unregistered analysts	7	
Total unique sanctions	9	804

Table 2
Descriptive Statistics

Panel A: Descriptive Statistics					
Variable	Mean	Q1	Median	Q3	Std. Dev.
Dependent Variables					
SR	0.513	0.000	0.000	1.000	1.056
Downgrade	0.384	0.000	0.000	1.000	0.486
SR_Rel	-0.046	-0.667	-0.154	0.643	0.920
Independent Variables					
Bhar	0.002	-0.052	0.000	0.051	0.113
Broker_Size	0.525	0.096	0.579	0.896	0.380
Firm_Exp	0.444	0.096	0.349	0.829	0.374
Follow	0.437	0.143	0.385	0.700	0.337
Gen_Exp	0.528	0.216	0.505	0.886	0.350
Meetbeat	0.673	0.000	1.000	1.000	0.469
Post_Action	0.500	0.000	1.000	1.000	0.500
Underwriter	0.908	1.000	1.000	1.000	0.289
COI	0.698	0.000	1.000	1.000	0.459
MISLEAD	0.132	0.000	0.000	0.000	0.338
NONPUB	0.207	0.000	0.000	0.000	0.405
SUPER	0.737	0.000	1.000	1.000	0.440
OTHER	0.071	0.000	0.000	0.000	0.257
Recidivist	0.603	0.000	1.000	1.000	0.489
Fine (in millions)	6.100	0.250	0.530	5.000	21.000

Panel B: Comparing Pre-Action and Post-Action Recommendation Characteristics				
Variable	Pre-Action	Post-Action	Difference	*p*-value
SR	0.607	0.418	-0.189***	0.000
Downgrade	0.356	0.413	-0.057***	0.000
SR_Rel	0.009	-0.101	-0.110***	0.000

The recommendation sample contains 11,354 stock recommendations relating to 81 research-related regulatory actions. The recommendation downgrade sample contains 8,028 observations. Variables are defined in Appendix A.

Table 3
Regulatory Actions and Analysts' Stock Recommendations

Variable	Column (1) *SR*	Column (2) *Downgrade*	Column (3) *SR_Rel*
Post_Action	-0.186***	0.393***	-0.112***
	(-7.331)	(4.911)	(-5.058)
Firm_Exp	0.034	-0.214**	0.033
	(1.141)	(-2.028)	(1.317)
Gen_Exp	0.027	0.161	0.040
	(0.716)	(1.300)	(1.244)
Follow	-0.070*	-0.478***	-0.095***
	(-1.656)	(-3.437)	(-2.787)
Broker_Size	-0.147***	0.290**	-0.322***
	(-2.715)	(2.021)	(-7.114)
Meetbeat	0.103***	-0.171**	0.024
	(4.466)	(-2.364)	(7.114)
Bhar	0.054	-0.351	-0.014
	(0.517)	(-1.104)	(-0.173)
Underwriter	0.716***	-0.579	0.566***
	(3.939)	(-0.852)	(3.084)
Sell		-5.258***	
		(-5.162)	
Buy		2.004***	
		(21.216)	
StrongBuy		3.083***	
		(24.709)	
Constant	0.846**	-3.154***	0.136
	(2.521)	(-3.911)	(0.432)
R^2/Area Under ROC	0.074	0.854	0.074
Observations	11,354	8,028	11,354

All regressions include year and brokerage fixed effects and standard errors are clustered by analyst. T-statistics are reported in parentheses with the exception of variables with predicted signs. ***, **, * represent statistical significance at the 0.01, 0.05, and 0.10 levels, respectively. Variables are defined in Appendix A.

Table 4
Likelihood of Downgrading Stock Recommendations After an Earnings Miss

Variable	*Downgrade*
Sanctioned_Analyst	0.394**
	(2.472)
Firm_Exp	0.072
	(0.350)
Gen_Exp	-0.147
	(-0.689)
Follow	-0.107
	(-0.545)
Broker_Size	-0.077
	(-0.206)
Bhar	1.197***
	(2.641)
Underwriter	0.873
	(0.777)
Constant	-0.878*
	(-1.763)
Pseudo R^2	0.067
Observations	1,531

The logistical regression includes year and brokerage fixed effects and standard errors are clustered by firm. T-statistics are reported in parentheses with the exception of variables with predicted signs. ***, **, * represent statistical significance at the 0.01, 0.05, and 0.10 levels, respectively. Variables are defined in Appendix A.

Table 5
Violation Type and Analysts' Stock Recommendations

Variable	Column (1) *SR*	Column (2) *Downgrade*	Column (3) *SR_Rel*
Post_Action	-0.145***	0.033***	-0.075***
	(-5.920)	(2.657)	(-3.440)
MISLEAD	-0.024	-0.108***	-0.012
	(-0.333)	(-3.477)	(-0.193)
*MISLEAD*Post_Action*	-0.305***	0.210***	-0.270***
	(-3.178)	(5.937)	(-3.226)
Firm_Exp	0.028	-0.,031**	0.028
	(0.949)	(-1.990)	(1.120)
Gen_Exp	0.022	0.022	0.036
	(0.592)	(1.171)	(1.123)
Follow	-0.063	-0.071***	-0.089***
	(-1.496)	-3.330)	(-2.634)
Broker_Size	-0.128**	0.046**	-0.306***
	(-2.374)	(2.133)	(-6.791)
Meetbeat	0.103***	-0.026**	0.024
	(4.495)	(-2.460)	(1.227)
Bhar	0.055	-0.051	-0.013
	(0.529)	(-1.126)	(-0.158)
Underwriter	0.641***	-0.098	0.503***
	(3.491)	(-1.055)	(2.712)
Sell		-0.177***	
		(-13.513)	
Buy		0.387***	
		(22.271)	
StrongBuy		0.602***	
		(28.819)	
Constant	0.946***	-0.020	0.221
	(2.814)	(-0.177)	(0.699)
R^2/Area Under ROC	0.078	0.367	0.078
Observations	11,354	8,030	11,354

All regressions include year and brokerage fixed effects and standard errors are clustered by analyst. T-statistics are reported in parentheses with the exception of variables with predicted signs. ***, **, * represent statistical significance at the 0.01, 0.05, and 0.10 levels, respectively. Variables are defined in Appendix A.

Table 6
Recidivist Actions and Analysts' Stock Recommendations

Variable	Column (1) *SR*	Column (2) *Downgrade*	Column (3) *SR_Rel*
Post_Action	-0.327***	0.976***	-0.199***
	(-7.267)	(8.400)	(-5.153)
Recidivist	-0.072	0.027	0.003
	(-0.926)	(0.133)	(0.051)
*Post_Action*Recidivist*	0.240***	-1.033***	0.155***
	(4.511)	(-6.664)	(3.329)
Firm_Exp	0.037	-0.228**	0.033
	(1.234)	(-2.131)	(1.355)
Gen_Exp	0.029	0.150	0.041
	(0.753)	(1.209)	(1.268)
Follow	-0.069	-0.503***	-0.093***
	(-1.620)	(-3.585)	(-2.711)
Broker_Size	-0.148***	0.277*	-0.320***
	(-2.738)	(1.930)	(-7.081)
Meetbeat	0.104***	-0.188**	0.025
	(4.536)	(-2.570)	(1.297)
Bhar	0.062	-0.369	-0.010
	(0.592)	(-1.108)	(-0.122)
Underwriter	0.715***	-0.459	0.535***
	(3.839)	(-0.628)	(2.842)
Sell		-5.221***	
		(-5.128)	
Buy		2.045***	
		(21.704)	
StrongBuy		3.114***	
		(24.186)	
Constant	0.803**	-3.735***	0.189
	(2.255)	(-4.219)	(0.570)
R^2/Area Under ROC	0.077	0.854	0.076
Observations	11,354	8,028	11,354

All regressions include year and brokerage fixed effects and standard errors are clustered by analyst. T-statistics are reported in parentheses with the exception of variables with predicted signs. ***, **, * represent statistical significance at the 0.01, 0.05, and 0.10 levels, respectively. Variables are defined in Appendix A.

Table 7
Market Reaction to Stock Recommendation Revisions Following Violation

Variable	*Ret*
Post_Action	0.005***
	(2.662)
Upgrade	0.008***
	(3.343)
*Post_Action*Upgrade*	-0.006**
	(-2.034)
Firm_Exp	-0.001***
	(-3.854)
Follow	-0.000***
	(-3.597)
Analyst_Count	-0.000**
	(-2.364)
Broker_Size	-0.005
	(-0.520)
EA	0.023***
	(7.619)
Other_SR	0.023***
	(9.956)
Constant	0.075*
	(1.922)
R^2	0.085
Observations	9,903

All regressions include year and brokerage fixed effects and standard errors are clustered by analyst. T-statistics are reported in parentheses with the exception of variables with predicted signs. ***, **, * represent statistical significance at the 0.01, 0.05, and 0.10 levels, respectively. Variables are defined in Appendix A.

Table 8
Regulatory Spillover

Panel A: Univariate Results – All Action Types

All Action Types

Analyst Type	Pre-Action	Post-Action	Difference	*p*-value
Analysts at Sanctioned Brokerage	0.614	0.431	-0.183***	0.000
Analysts at Non-Sanctioned Brokerage	0.579	0.420	-0.160***	0.000
Difference	-0.035**	-0.011		
p-value	0.030	0.491		

MISLEAD Actions Only

Analyst Type	Pre-Action	Post-Action	Difference	*p*-value
Analysts at Sanctioned Brokerage	0.808	0.369	-0.439***	0.000
Analysts at Non-Sanctioned Brokerage	0.550	0.302	-0.248***	0.000
Difference	-0.258***	-0.067		
p-value	0.000	0.170		

Table 8 (continued)
Regulatory Spillover

Panel B: Regression Results		
Variable	Column (1) *SR*	Column (2) *SR*
Post_Action	-0.101***	-0.097***
	(-8.739)	(-7.725)
Sanctioned_Analyst	0.049**	0.042*
	(2.124)	(1.792)
Mislead		-0.044*
		(-1.814)
*Post_Action*Sanctioned_Analyst*	-0.047*	-0.016
	(-1.686)	(-0.593)
*Post_Action*Mislead*		-0.051
		(-1.509)
*Sanctioned_Analyst*Mislead*		0.028
		(0.387)
*Post_Action*Sanctioned_Analyst*Mislead*		-0.234**
		(-2.105)
Firm_Exp	-0.007	-0.007
	(-0.435)	(-0.450)
Gen_Exp	0.017	0.016
	(0.878)	(0.823)
Follow	-0.038**	-0.036*
	(-1.977)	(-1.837)
Broker_Size	-0.103***	-0.117***
	(-3.047)	(-3.519)
Meetbeat	0.061***	0.061***
	(5.781)	(5.724)
Bhar	-0.045	-0.042
	(-1.097)	(-1.018)
Underwriter	-0.243**	-0.240**
	(-2.186)	(-2.159)
Consensus	0.433***	0.431***
	(36.444)	(36.370)
Constant	0.874***	0.877***
	(3.599)	(3.617)
R^2	0.112	0.113
Observations	42,068	42,068

The regression includes year and brokerage fixed effects and standard errors are clustered by analyst. T-statistics are reported in parentheses with the exception of variables with predicted signs. ***, **, * represent statistical significance at the 0.01, 0.05, and 0.10 levels, respectively. Variables are defined in Appendix A.