Do Analysts Matter for Corporate Social Responsibility? Evidence from Natural Experiments

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Abstract

We examine the causal impact of financial analysts on firms' socially responsible activities. Relying on brokerage closures and mergers as natural experiments which generate exogenous changes in analyst coverage, our Difference-in-Differences estimator indicates that a reduction in analyst coverage causes firms to engage more aggressively in irresponsible behavior, especially in the dimensions of environmental issues and product quality and safety concerns. The effects of analyst coverage on irresponsible activities are more pronounced in firms with lower initial analyst coverage, weaker corporate governance and higher financial constraints. Our paper identifies the deterrent effect of financial analysts as an important determinant in firms' CSR choice, and sheds light on the impact of financial analysts on non-financial stakeholders.

JEL Classification: G34, G24, M14

Key words: financial analysts, corporate social responsibility, corporate governance

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1. Introduction

"…mainstream corporate analysis considers key financial data … main criteria, but analysts actively screen companies with poor ESG (Environment, Social, and Corporate Governance) ratings or involvement in controversial ESG issues." – Deutsche Bank report 2012.

Corporate social responsibility has become a mainstream business practice around the world over the past decade. Firms are investing ever more resources in promoting socially responsible activities and reducing negative externalities (Kitzmueller and Shimshack, 2012). According to a recent KPMG global enterprise survey (KPMG 2013), 71% of the firms in their sample report their CSR activities and 51% of the reporting companies now include the CSR information in their annual financial reports[1]. Among the world's largest 250 firms, the CSR reporting rate is 93% and 83% of these firms state in their reports that they have a corporate responsibility strategy (KPMG 2013). The importance of the CSR in corporate operation can also be reflected by the SRI (socially responsible investing), an investment strategy which seeks to consider environmental and social good to generate long-term competitive financial returns and positive societal impact. According to the 2014 Report on Sustainable and Responsible Investing Trends in the United States (Social Investment Forum), more than one out of every six dollars under professional management in U.S. (total amount more than $6.5 trillion USD) was invested according to SRI strategies. In the academic literature, a large number of studies have examined the link between CSR and firm value/performance and documented mixed evidence (see Deng et al., 2013, for a very comprehensive review of the related studies)[2].

[1] The inclusion ratio is about 9% in 2008 and 20% in 2011.

[2] As a result, the causal relationship between "doing good" and "doing well" is still not clear and there is an ongoing debate on "doing good by doing well" or " doing well by doing good" (Liang and Renneboog, 2014).

Despite the growing importance of the CSR investment to corporate operation and the academic debates on the value implication of CSR, there is only very limited evidence investigating the determinants of corporate CSR activities and performance. In this paper, we examine the causal impact of stock analyst coverage on corporate social responsibility.

The existing literature offer competing views on the link between financial analysts and firms' CSR performance. On the one hand, based on a survey of 388 financial analysts and fund managers initiated by CSR Europe, Deloitte, and Euronext (2003), about 80% of financial analysts and fund managers indicated that socially responsible activities create value for the firms in the long run, and about half of them take CSR performance into account. Moreover, 37 percent of financial analysts indicate that they would grant a stock price premium (discount) to socially responsible (irresponsible) companies[3]. This is consistent with the view CSR activities enhance firms' reputation for keeping their commitment with respect to the implicit/explicit contracts with key stakeholders (e.g. employees, customers, clients) and as a consequence, increase the stakeholders' willingness to contribute resources and efforts to support the firms' operation, which in turn, improves shareholder wealth (Deng et al., 2013). Analysts' emphasis on CSR is also evidenced by Luo et al. (2014), which interview 28 financial analysts and provide the qualitative evidence that the majority of the analysts monitor firms' performance in CSR closely in the firms they cover. As concluded in Jemel-Fornetty et al. (2011), "mainstream analysts… were starting to pay more attention to the potential for ESG-related research to add investment value". In line with this, Luo et al. (2014) document that the analyst recommendations tend to be upgraded

[3] Consistent with this, more than 50% of the firms in KPMG global enterprise survey (KPMG 2013) view the social and environment management as an opportunity to strengthen brands and corporate reputation and more than 30% of them view this as an important opportunity in improving market position, growing market share and reducing costs.

(downgraded) if there is an increase (decrease) in firms' CSR performance[4]. In this regard, we would expect a positive impact of analyst coverage on corporate CSR performance as CSR activities can act as a value-enhancing corporate strategy, which gain the attention from analysts and are taken into account in their reports[5].

On the other hand, CSR activities might reflect conflicts of interests between shareholders and managers, where managers pursue their personal and social reputation at the costs of shareholders (Baron, 2008; Masulis and Reza, 2015)[6]. In other words, CSR activities might be the manifestation of agency problems and managerial preferences (e.g. altruism, social prestige, etc.). This type of agency conflict might be particularly severe as it is very difficult to quantify and measure the tangible or intangible social and financial benefits that accrue to a corporation caused by its CSR activities[7]. Therefore, compared to the other types of corporate investment activities, managers might find it easy to promote their personal preferences and pursuit their private interests at the costs of other shareholder through CSR activities[8]. As documented in recent studies (e.g. Brown et al., 2014), financial analysts spend real resources and efforts on various activities such as interviewing consumers and suppliers, visiting companies and facilities, etc., to gather information beyond the mandatory disclosures (Brown et al., 2014). As a result, they play a very important disciplinary role in mitigating managerial expropriation

[4] As some anecdotal evidence, Wisconsin Energy Corp was downgraded on Sep 26, 2014 by analysts at Zacks from an outperform rating to a neutral rating for the concern of "mounting pressure from the U.S. government to meet environmental safety standards during power generation". More recently, Apple's stock price dropped by 0.8% pre-market (four billion USD losses in shareholder values) after being downgraded for being immoral to the employees.

[5] Using text-based analysis, Huang et al. (2012) shows CSR performance is an important component in analysts' report. The analysts also consider CSR performance when they make a recommendation.

[6] As pointed out in Besley and Ghatak (2005), agents have preferences for money, social and public goods as well as reputation.

[7] Indeed, as reviewed by Krüger (2015), the literature provide very mixed evidence about the link between corporate CSR and firm value.

[8] Masulis and Reza (2015) find that corporate giving reduces value of firm cash holdings. Furthermore, they find evidence that corporate donations advance managerial private interests.

of outside shareholders (Chen et al., 2015)[9]. If the corporate CSR is mainly a manifestation of agency problems and a mechanism facilitating the managers' pursuit of private interests, we would expect that analyst coverage is negatively associated with CSR activities. The close observation and communication with different stakeholders make the firms' irresponsible activities to suppliers, customers, and employees, easily exposed to the financial analysts.

The existing literature is incomprehensive to draw a causal conclusion because of the potential endogeneity problem. For example, corporate CSR activities might attract/deter analyst coverage. Conversely, analyst coverage might encourage or discipline corporate CSR activities. In addition, analyst coverage and corporate CSR performance might be jointly affected by some corporate characteristics (e.g. corporate governance). In this study, we attempt to explore the causal impact of financial analysts on firms' CSR performance by using two natural experiments, i.e. broker closures and broker mergers. The two natural experiments have been used in the previous literature (e.g. Hong and Kacperczyk, 2010; Kelly and Ljungqvist, 2012) and are shown to be orthogonal to corporate policies. Our paper is the first one, to our best knowledge, to examining how analyst coverage *causally* affects CSR activities.

Specifically, we construct our sample by identifying firms experiencing exogenous drop on analyst coverage due to broker closures and broker mergers. The two natural experiments have been widely used in the literature and are orthogonal to corporate policies, i.e. firms' engagement in socially irresponsible behavior. More importantly, our identification strategy allows multiple shocks to affect different firms at different times, which greatly alleviate the potential omitted variable problems.

[9] Chen et al. (2015) find that after a firm experiences an exogenous decrease in analyst coverage, shareholders value internal cash holdings less, its CEO receives higher excess compensation, its management is more likely to make value-destroying acquisitions, and its managers are more likely to engage in earnings management activities

Closely following literature, we successfully identify 39 brokerage exits, including 22 brokerage mergers and 17 brokerage closures, between 2000 and 2010, associated with 1,938 firm-year observations that experience exogenous analyst coverage decreases. We obtain corporate social responsibility data from KLD database and we define corporate irresponsible scores as negative CSR score, i.e. CSR concerns score minus CSR strengths score, to capture the net irresponsible behavior[10]. Under a Difference-in-Differences (DID) regression approach, we find concrete evidence that treated firms, compared with their control firms, are more active in socially irresponsible activities after experiencing exogenous drop in analyst coverage, after controlling for a battery of other factors.[11] Specifically, our Difference-in-Differences (DID) regression results show that net irresponsible activities (number of CSR concerns minus number of CSR strengths) in treated firms increase by 0.155 after deducting the trend in matched control firms. The results would not change if we use adjusted irresponsible score (adjusted CSR concerns minus adjusted CSR strengths), as the net irresponsible score could be influenced by the different number of items investigated by KLD in different years (Manescu, 2009). Our robustness check using Difference-in-Differences matching estimator (ATT) further confirms our main finding that irresponsible behavior increases significantly for treated firms that exogenous increase in information asymmetry due to the loss of analysts following. The Difference-in-Differences matching results are robust and consistent across six different combinations of matching dimensions.

The increase in irresponsible behavior could come from two sources, i.e. the increase in purely irresponsible activities (CSR concerns) and the decrease in purely responsible activities (CSR strengths). To conduct a thorough study on firms' CSR

[10] According to Kotchen and Moon (2011), firms tend to engage in corporate social responsibilities (CSR) to offset their engagement in corporate social irresponsibility (CSI). We also do robustness check using CSR concerns, which reflect the number of harmful deeds, and our results hold.

[11] We show that the trends from year t-1 to year t are parallel for our treated firms and control firms, which is a key assumption for our difference-in-differences analysis.

performance after experiencing exogenously aggravated information asymmetry, we further decompose the irresponsible score (net irresponsible behavior) into *Concerns* and *Strengths*. Our DID regressions and matching estimators shows that the increase in net irresponsible behavior is driven by the increase in CSR Concerns. In other words, the treated firms keep comparable socially good deeds as their matched firms; however they have significantly more socially harmful deeds.

One advantage of KLD database is the detailed classification of CSR performance. We make the best use of the database and carefully examine each dimensions of CSR performance. Previous literature shows that financial analysts may have different emphases on different dimensions of social responsibility. For instance, Nichols and Wieland (2009) show that analysts' information intermediary role is more important when firms issue product-related non-financial information, which matters for firms' sales and future cash flows. At the same time, Fieseler (2011) highlights that equity analysts perceive environmental sustainability as long-run value-enhancing and lay much emphasize on firms environmental irresponsible activities. Therefore we should expect the deterioration in CSR performance should be more pronounced in environment issues and product-related issues. Following literature, we examine six dimensions of CSR performance, including community, diversity, employment, environment, human rights, product safety and quality. Consistent with previous literature, we find the increase in irresponsible activities is driven by irresponsible behaviors in environment issues and product safety and quality issues.

So far we have established negative causality from analyst coverage to corporate irresponsible behavior. However, our findings might be a "smoking gun" without pointing out the specific channels, through which financial analysts curb corporate irresponsible behavior. As we obtain our main results using exogenous shock on analyst coverage, we naturally start with the level of initial analyst coverage. If the causal

relationship is valid, we should observe a more profound impact in firms with fewer analysts following before the brokerage exit. Intuitively, losing one analyst has a larger impact for firms followed by 5 financial analysts than for firms followed by 15 financial analysts. Previous literature using the same settings has documented that firms with lower initial analysts experience a more drastic change in their information environment and external monitoring (Hong and Kacperczky, 2010; Irani and Oesch, 2103; Chen et al., 2015). Therefore we expect the increase in socially irresponsible activities to be more pronounced in treated firms with low initial analyst coverage (below the median of treated sample). Consistent with this argument, we find an increase of 0.267 in irresponsible score (higher than 0.155 in full sample regression) in treated firms with low initial analyst coverage. And the result is not significant in firms with high initial analyst coverage.

Next we examine the impact of firms' corporate governance and examine how this mechanism affects the link between financial analysts and corporate irresponsible performance. As Jo and Harjoto (2011) suggest, CSR choice is positively associated with governance characteristics since well-designed corporate governance systems would align managers' incentives with those of stakeholders and ensure firms' sustainability via sound business practices that promote accountability and profitability. In addition, Chen et al. (2015) document that the moral hazard issues caused by exogenous analyst reduction could be mitigated by strong product market competition, which serves as an external corporate governance mechanism. Therefore we expect stronger corporate governance to alleviate firms' engagement in irresponsible behavior after experiencing exogenous shock in analyst coverage. Specifically, we investigate the role of board independence and product market competition in shaping the relation between analyst loss and irresponsible activities. The regression results show that the increased engagement in social harm only exists in firms with lower board independence and with

higher market concentration level. For instance, for firms operating in high HHI industries, we find that the irresponsible score of our treated firms increases by 0.259 compared with the control firms. In contrast, there is no change in firms operating in low HHI (more competitive) industries.

We then investigate the effect of firms' financial constraints. As Hong et al. (2012) show that firms would only do good when they are doing well (i.e. financially unconstrained), financial constraint could be another underlying economic mechanism. Firms with more financial constraints are more subject to underinvestment problems, thus are more likely to preserve funds through irresponsible activities, such as untreated sewage discharge, child-labor in sweatshops, and cheap and unreliable material for products, when facing decreased whistle-blowers and external monitoring. In other words, if the exogenous loss in analyst coverage induces more irresponsible activities, the effect should be more profound for firms with more financial constraints. Using four different alternative measures of financial constraints (i.e. Hadlock and Pierce financial constraint index, Whited and Wu financial constraint index, firm size, and whether the firms pays out dividend), we find consistent evidence that the effect is indeed more pronounced in firms that are more financially constrained prior to broker terminations.

Taken together, our results suggest that the information role of financial analysts and resulted external monitoring tend to be an important driving force in mitigating firms' irresponsible behaviors. We show that reduction in analyst coverage causally induces corporate socially irresponsible performance, particularly in terms of environmental issues and product safety and quality concerns. And the link between these two further depends on initial analyst coverage, corporate governance and financial constraints. By doing so, our paper contributes to two strands of the literature. First, our paper contributes to the growing literature investigating the determinants of CSR. Despite

the benefits of behaving in socially responsible ways[12], there are only limited studies exploring how to reduce firms' irresponsible behavior and create social welfare[13]. For example, Dhaliwal et al. (2011) find that firms tend to voluntarily disclose CSR reports if confronted with high cost of equity in the previous year. Moreover, by reviewing firms' press releases, Chakravarthy et al. (2014) posit that firms have incentives to take responsible actions toward multiple stakeholders after serious restatements. Using import tariff reductions as a quasi-natural experiment, Flammer (2015) find that with higher product market competition, firms increase their engagement in CSR activities, since CSR could be "a competitive strategy" that allows companies to differentiate themselves from their foreign rivals. Cao et al. (2015) document that the product market peer effect of CSR is an important driving force behind the CSR performance. Also, Di Giuli and Kostovetsky (2014) conclude that firms with Democratic founders, CEOs, and directors, headquartered in Democratic states, spend $20 million more on CSR than Republican-leaning firms every year. In the spirit of the theoretical literature arguing that monitoring from institutions helps mitigate the irresponsible behavior, our paper identifies the role of financial analysts, one of most powerful monitors in reducing managerial misbehavior, in curbing irresponsible activities. Our findings highlight the importance of external monitoring in shaping firms' CSR performance.

Our paper also adds to the literature discussing the role that financial analysts play in the financial market. Existing literature finds that analysts help reduce information asymmetry, serve as external monitors to firm managers, thus affect firms' investment and financing (Hong and Kacperczyk, 2010; Irani and Oesch, 2013; Derrien and Kecskes,

[12] Most empirical studies focus on how corporate social responsibility performance affects firms' financial performance. For example, Deng et al. (2013) document that socially responsible acquirers obtain higher announcement CAR and their M&As are more likely to be value-enhancing.

[13] In the review paper by Margolis and Walsh (2003), during the thirty years (1972-2002), there are only 22 studies studying the determinants of socially responsible behavior, representing 15% of the literature related to CSR.

2013). These studies however overlook an increasingly important aspect of agency problems, i.e. the conflicts between the firms and non-financial stakeholders. In this paper, we document that analysts affect firms' CSR activities, and analyst coverage causally increases firms' social goodness, especially through reducing firm's irresponsible practices. To our best knowledge, our paper is the first one establishing the causality that financial analysts reduce corporate social irresponsible activities. The results deepen the understanding of the information role of financial analysts from a broader perspective and point out another channel through which financial analysts could affect firm value, i.e. by reducing potential risk and cost due to irresponsible behavior.

The reminder of the paper proceeds as follows. Section 2 introduces the sample, data and variables. Section 3 describes our main analysis. Section 4 contains the analysis on impact of factors. Section 5 concludes the paper.

2. Sample and Data

2.1 The natural experiments

As the analyst coverage is likely to be endogenous (Chung and Jo, 1996), we rely on two natural experiments widely used in the literature to create exogenous shocks on analyst coverage and investigate the role of financial analysts in curbing firms' socially irresponsible activities. Specifically, we construct our sample by identifying firms experiencing exogenous drop on analyst coverage due to broker closures and broker mergers, which are exogenous to individual firms' corporate social responsible performance. The first kind of natural experiments -- brokerage closures are triggered by business strategies rather than the characteristics of firms they cover (Kelly and Ljungqvist, 2012). Using brokerage closures as natural experiments for information supply, Kelly and Ljungqvist (2012) test the information asymmetry asset pricing theory. Therefore brokerage closures are an ideal setting that reduces the information content

provided by financial analysts. As the information content reduces, we expect analysts' power in detecting corporate irresponsible activities to decrease as well. The second source of exogenous analyst coverage change comes from brokerage mergers. When two brokers merge, they often dismiss analysts to avoid redundancy and culture-clash (Wu and Zang, 2009). Importantly, if each brokerage house has an analyst following the same firm, they would usually dismiss the analyst from the target firm (Hong and Kacperczyk, 2010). Therefore firms followed by both brokerage houses before the merger will experience an exogenous drop on analyst coverage. Relying on brokerage mergers as natural experiment, Hong and Kacperczyk (2010) document a concrete evidence of information environment change by showing an increase in analysts' forecast bias due to exogenous reduction in competition among analysts. As the forecast is optimistically biased, we expect firms' incentive to engage in socially irresponsible activities to increase. Using the two kinds of natural experiments, we not only resolve the potential endogeneity concerns, but also alleviate the omitted variable problems by allowing multiple shocks to affect different firms at different times.

To capture such change in monitoring from financial analysts, we start our sample construction according to the broker closure list in Kelly and Ljungqvist (2012). And following Chen et al. (2015), we extend the event list to 2010. Specifically, we search for the brokers who disappeared in I/B/E/S database between 2008 and 2010. Then we search for news released in Factiva to confirm that the disappearance is due to broker closure. To extend the broker mergers, we follow Hong and Kacperczk (2010). Specifically, we use Thomson's SDC Mergers and Acquisition database and search for acquisitions between mergers. We restrict the mergers to the period from 2008 to 2010 and require both the acquirer and the target primary SIC codes to be 6211 or 6282. Following Chen et al. (2015), we only keep completed deals and deals in which 100% of the target is acquired. Then we manually match and check the broker house in the I/B/E/S data.

After extending the closure list, we construct the sample of firms that experience exogenous drop in analyst coverage. Following the literature, we have adopted different strategies for broker closures and broker mergers to construct our sample. For broker closures, we follow Kelly and Ljungqvist (2012) and retain only firms for which the estimate is "stopped" in I/B/E/S only after the date of broker disappearance. For the broker mergers, we retain only firms covered by both brokerage houses before the merger and firms with only one of their analysts following disappears. The latter requirement rules out the possibility that the brokerage determines to drop both analysts due to any firm-specific characteristics. To ensure that there are no other confounding events, which lead to an increase in analyst coverage and weaken the impact of exogenous shock on corporate social responsibility, we require that treated firms in our sample to have a realized analyst coverage reduction in the year after the event.

2.2 Measures of Corporate Socially Irresponsible Scores

To measure a firm's engagement in socially irresponsible activities, we construct the scores using the KLD database. The KLD database has been widely used the literature on corporate social responsibility, for example Deng et al. (2013) and Servaes and Tamayo (2013). After 2003, the database has been comprehensive and covers more than three thousand firms that comprise Russell 3000. The KLD database provides detailed information of firms' CSR activities according to thirteen categories, i.e. community, diversity, employment, environment, human rights, product, alcohol, gaming, firearms, military, nuclear, tobacco and corporate governance. Within each category, the database shows whether the firm has conducted a good deed (a harm). If the firm has met the requirement of goodness (harm), it would gain one point in strength (concern). The numbers of strengths and concerns within each category differ cross investigating years.

To measure the overall irresponsible activities or CSR performance of a firm, we consider six specific dimensions, i.e. community, diversity, employee relationship, environment, human rights, and product quality and safety. Unlike Deng et al. (2013) which measures the overall CSR score based on seven dimensions, we exclude corporate governance in our measure construction. Firstly, corporate governance is perceived as mechanism to mitigate the conflicts between principles and managers (Shleifer and Vishny, 1997). Corporate socially irresponsible activities, on the other hand, affect non-financial stakeholders, for example community and employees, rather than shareholders. Secondly, previously literature has documented deterioration in corporate governance after the exogenous shock in analyst coverage due to brokerage house closures and mergers.[14] Therefore including corporate governance in our irresponsible score measure would be redundant and bias our results from this perspective. In order to rule of the impact of "doing good to compensate bad deeds", our key measure for irresponsible score is the negative CSR score. We count the numbers of strengths and concerns within each of the selected six categories and then subtract the number of strengths from the number of concerns to construct the raw Irresponsible Score for each category each year. The overall Irresponsible Score is the sum of the raw scores of the six categories. A higher *Irresponsible Score* indicates worse CSR performance, i.e. the firm is doing more harm or/and doing less goodness. However, as pointed by Manescu (2009), the Raw CSR Score might be problematic in evaluating a firm's CSR activities over years as the investigating items in strengths and concerns within each category differ. To overcome this concern and conduct both cross-sectional and time-series analysis, we scale the strengths and concerns for each firm year to [0,1]. Specifically, we divide the number of strengths (concerns) for each firm-year within each CSR category by the maximum

[14] For example, Irani and Oesch (2013) documents a decrease in financial reporting quality after the firm lost an analyst exogenously. Chen et al. (2015) shows firms tend to hold more cash, do more value-destroying M&A, and pay the managers in a more excessive way.

possible number of strength (concerns) in each CSR category each year. Then we subtract the adjusted strength index from the adjusted concerns index. Then for each category, the adjusted irresponsible score ranges from -1 to +1. For the overall adjusted Irresponsible Score (*Irresponsible Score_adj*), we sum up the six adjusted scores. Therefore the adjusted Irresponsible Score ranges from -6 to +6 in theory. For robustness, we check the impact of analyst coverage drop on CSR Concerns and adjusted CSR Concerns. *Concerns* is defined as the sum of concern numbers in the six categories and adjusted Concerns (*Concerns_adj*) is defined as the sum of adjusted concern numbers in the six categories.

2.3 Sample and Summary Statistics

To construct our sample, we firstly merge the sample of firms experiencing exogenous drop in analyst coverage with our measures of Irresponsible Scores in year *t-1* and *t+1*. Following Chen et al. (2015), we keep the firm-year observations of only *t-1* and *t+1* to make sure we capture only the direct effects of exogenous drop in analyst coverage. We then obtain financial data from Compustat and number of analyst following from I/B/E/S database. In order to find the control firms for regression analysis, we firstly require the treated and control firms to have the same Fama-French 48 Industry Classification Code. Then within each industry, each year, we require the control firms to be in the same Size, Q, and Analyst Coverage terciles. Further we require the firm-year observations to have non-missing control variables in our main difference-in-differences (DID) regression. Table 1 shows the summary statistics for our sample in baseline regression analysis. Our sample contains 6,260 firm-year observations over the period of 1999 (min. year *t-1*) to 2011 (max. year *t+1*), from 1,538 unique U.S. public firms. Our regression sample contains 1,938 treated firm-year observations for 693 unique firms. The treated firm-years are associated with 39 brokerage exits, including 22 brokerage mergers and 17 brokerage closures. On average, our sample firms have an Irresponsible Score of -0.27,

indicating the net concerns is -0.27, i.e. firms are doing more social goodness (Strengths) than social harm (Concerns). However the number is negative probably because there are more items of Strengths investigated than of Concerns investigated at different times. The adjusted Irresponsible Score addresses this problem by adjusting the time trend in investigated items. As shown in the Irresponsible Score_adj (mean=0.11), our sample firms are doing more harm than good. The control variables include Size, Market-to-Book, Leverage, ROA, Stock-return volatility, Dividends, R&D expenses and SG&A expenses. Detailed definitions are given in Appendix A.

[Insert Table 1 about here]

3. Empirical Results

Before we conduct any empirical analysis on whether analyst coverage impacts firms' involvement in socially irresponsible activities, we depict the trend of Irresponsible Scores of our treated and control firms over the three years around the natural experiments. According to Figure 1, after experience the exogenous shock (drop) on analyst coverage, the treated firms increase their engagement in social irresponsible activities in year *+1*. Control firms, however, have shown a decrease in Irresponsible Score over the three-year window. We find consistent evidence in both Irresponsible Score (Figure 1a) and Adjusted Irresponsible Score (Figure 1b). More importantly, the figures show that the treated and control firms are parallel in both irresponsible activity measures before the shocks, which is the key assumption in any Difference-in-Differences analysis (Roberts and Whited, 2012). As the divergence only occurs after the treated firms lose analysts exogenously, the figures lend intuitive support to the argument that financial analysts could deter socially irresponsible behavior through external monitoring. However what we observe in the figures could be driven by other cross-sectional heterogeneity between treated and control firms. To confirm and quantify the

impact of exogenous analyst coverage reduction on firms' irresponsible behavior, we turn to difference-in-differences (DID) regression analysis and matching approach (ATT).

[Insert Figure 1 about here]

3.1 Main results: Difference-in-Differences Regression Approach

We adopt a difference-in-differences regression approach to investigate the impact of exogenous analyst coverage drop on firms' irresponsible behavior. Specifically, we run the following regression model to control for cross-sectional heterogeneity.

$$Irresponsible\ Score_{i,t} = \alpha + \beta_1\left(Treated_{i,t} \times Post_{i,t}\right) + \beta_2 Treated_{i,t} + \beta_3 Post_{i,t} + +\delta' X_{i,t-1} + \varepsilon_{i,t} \quad (1)$$

where $Irresponsible\ Socre_{i,t}$ is Raw Irresponsible Score or Adjusted Irresponsible Score; $Treated_{i,t}$ is a dummy variable equals to 1 if the firm has experienced an exogenous drop on analyst coverage due to broker closures or mergers, and 0 otherwise; $Post_{i,t}$ is a dummy variable equals to one in the period after the event, i.e. in year *+1*, and zero otherwise, i.e. year *-1*. Our variable of interest is the interaction variable, $Treated_{i,t} \times Post_{i,t}$. The coefficient β_1, which captures the Difference-in-Difference effect, shows the difference between treated firms and control firms in their engagement in corporate irresponsible activities after the natural experiments. The vector X_i contains a set of firm-specific variables that are documented to affect firms' CSR performance. Specifically, we control for Size, Tobin's Q, Book Leverage, profitability (ROA), stock return volatility, dividend payment, R&D expenses and SG&A expenses. Firm- and year-fixed effects are included in our regression model as well.

In Table 2, we tabulate the difference-in-differences regression results. Columns (1)-(3) show the results for regressions with Raw Irresponsible Score as dependent variables and

Columns (4)-(6) show the results for regressions with Adjusted Irresponsible Score as dependent variables.

[Insert Table 2 about here]

Consistent with the trend shown in Figure 1a and Figure 1b, our difference-in-differences regressions show that after the exogenous drop in analyst coverage, treated firms significantly increase their involvement in socially irresponsible activities. For example, in Column (3) the coefficient of interaction term is 0.155, significant at 5% level. The evidence suggests that compared with the matched control firms, the treated firms do 0.155 more socially irresponsible activities than socially responsible ones. To show the economic significance, we compare with our coefficient with the mean of Raw CSR Score of our sample, which is -0.26. Therefore the increase is about 60% of the absolute value of the sample mean. We could also get a sense of the impact of analyst coverage shock on irresponsible activities by comparing the coefficient (β_2) of $Post_{i,t}$ and the coefficient of the interaction term. In Column (3), we find a highly significantβ_2, -0.191, significant at 1%. The evidence shows that our sample firms reduce their engagement in irresponsible activities by 0.191 after the shock (a time trend). However if the firm falls into treated firm category, compared to the control firms, its Irresponsible Score increases by 0.155, which is close to 0.191. Consistent with the trend we observe in Figure1a, despite the downward trend of irresponsible score in control firms, the treated firms almost stay in the same level in year *-1* and year *+1*. Using adjusted irresponsible score as dependent variables, we find consistent results that after experiencing exogenous shocks in analyst coverage firms are more likely to engage in irresponsible activities. [15]

3.2 Nearest-neighbor Matching Approach (ATT)

[15] We do not interpret the coefficients of the control variables as we only include year *-1* and year *+1* in our sample and controlling for firm-fixed effects in short window regression would often lead to insignificant results in control variables.

In addition to relying on our difference-in-differences regression results, we also adopt the difference-in-differences matching estimator (ATT) approach to refine our control sample (Abadie and Imbens, 2006). Specifically we search for the nearest non-treated neighbor-year for each of our treated firm-years in the same Fama-French 48 industry based on our selected criteria. We have adopted six combinations of matching dimensions drawn from Size, Q, Analyst Coverage, Leverage, ROA, Dividend payments, R&D expenses and SG&A expenses. We obtain consistent results as difference-in-differences regressions that the exogenous drop in analyst coverage lead to an increase in firms' involvement in irresponsible activities. We show our matching results in Table 3. [16]

[Insert Table 3 about here]

As shown in Table 3, across six different combinations of matching dimensions, the CSR performances of our treated firms get worse compared to their matched control firms. For example, in Panel A, we tabulate the matching estimators for change in Irresponsible Scores. If we match our treated firms with untreated firms according to Size, Q, Analyst Coverage, and ROA (Row 4), we obtain an ATT of 0.16, significant at 1% level. The results are driven by both the increase of Irresponsible Score (0.07) in treated firms and the decrease of Irresponsible Score (-0.08) in matched control firms. In Panel B, we compare the differences in Adjusted Irresponsible Scores between treated firms and control firms and confirm our findings. [17] For example, matched by Size, Q, Leverage and Analyst Coverage, the adjusted irresponsible score increases by 0.03 in our treated firms, while the adjusted irresponsible score in matched control firms does not change. The ATT matching estimator is 0.03, significant at 1% level, revealing that the treated

[16] Our matching results differ in sample size (ranges from 1018 to 1039) across different matching dimensions as we only require non-missing matching variables in each matching.

[17] Our matching results will not change if we add irresponsible scores in year -1 as an additional matching dimension.

firms are more likely to be socially irresponsible after losing an analyst exogenously. The evidence lends support to our main findings using DID regressions and is consistent with the trend depicted (i.e. irresponsible score decreases for control firms but increase for treated firms) in Figure1.

3.3 Robustness Test: The impact of analyst coverage reduction on CSR Concerns and Strengths

We check the robustness of our results using CSR Concerns, which according to our argument are more affected by the monitoring from external analysts, compared with CSR Strengths. In the same vein as our main analytical framework, we run Difference-in-Differences regressions and perform nearest-neighbor matching with CSR concerns and CSR strengths as dependent variables. The results are tabulated in Table 4.

[Insert Table 4 about here]

In line with our argument, we find that the interaction terms are only significant when we use CSR concerns as dependent variables (Column (1) - (2), Panel A). For example, we document that the number of corporate social responsibility concerns (irresponsible behavior) increase by 0.167 for our treated firms compared with their matched control firms. It implies that the treated firms do 0.167 more irresponsible activities than the control firms when there is an exogenous drop in financial analyst. The results are significant at 1% level. We obtain consistent result using adjusted CSR concerns as dependent variables in Column (2) Panel A Table 4. In contrast to the sharp increase in *Concerns*, CSR *Strengths* are mostly the same for our treated firms and control firms. Neither coefficient on the interaction term is significant in Column (3) and Column (4).

We present the matching results for the change in *Concerns* and *Concerns_adj* in Panel B and Panel C, respectively.[18] Consistent with our regression results, we find significant increases in CSR Concerns in our treated firms compared with control firms across all dimensions. We depict the trend in CSR concerns for our treated firms and controls in Figure 2.

[Insert Figure 2 about here]

In addition to confirming our argument, the results in the robustness check imply the necessity of deducting responsible activities from irresponsible ones to capture the net irresponsible behavior. The regression result in Column (2) shows that there is an increase in CSR *Concerns* over time, i.e. $Post_{i,t}$ has a significantly positive coefficient of 0.040. However the firms tend to do more social goodness as a makeup, i.e., $Post_{i,t}$ has a significant positive coefficient of 0.059. Therefore we observe a decrease in irresponsible activities for our control firms. Based on these logics, we use net irresponsible scores for further analysis.

3.4 Components Analysis

Furthermore, we look at the impacts of exogenous analyst coverage reduction on different components of irresponsible activities. In the interview with equity analysts, Fieseler (2011) highlights that equity analysts perceive environmental sustainability as long-run value-enhancing and lay much emphasize on firms environmental irresponsible activities.[19] Nichols and Wieland (2009) show that analysts' information intermediary role is more important when firms issue product-related non-financial information, which matters for firms' sales and future cash flows. And in our key words search in analyst

[18] We do not tabulate the insignificant NN match results for CSR strengths to save space. The results are available from authors by request.

[19] For example, one sell-side analyst responded to the interview "You have to form an opinion on the prospects of accompany… one modern example would be CO_2 emission fines, which influence the cost of energy."

reports, we also find "environmental" and "product quality" to appear more frequently than the other categories of corporate social responsibility dimensions and the analysts' emphasis on these categories increase over time.[20] These evidences show that financial analysts emphasize different dimensions in CSR performance to different extents. To find out which component is more important, we conduct the difference-in-differences regression for each of the six irresponsible categories. We obtain significant results for categories environmental category and product quality and safety, which are consistent with the anecdotal evidences. The irresponsible behaviors also increase in other dimensions (all coefficients on interaction terms have positive sign). We tabulate our empirical results in Table 5.[21]

[Insert Table 5 about here]

In Column (1) and Column (2), our difference-in-differences regression shows that the involvement in environmentally irresponsible activities increases significantly in our treated firms. The general trend, however, is a decrease in environmental irresponsible score as shown by the significant negative coefficient of $Post_{i,t}$. And we find deterioration in product safety and quality as well in Column (3) and Column (4). Our empirical results confirm that environmental sustainability and product quality and safety tend to be emphasized more by equity analysts. [22] When there is exogenous reduction in financial analysts, firms tend to be more irresponsible in terms of environmental issues and product safety and quality.

[20] For example, using "environmental protect*/ clean energy*/ recycle*" as key words, we find 26,942 reports from financial analysts in year 2013, and the number in 2011 is 13,788. And using "product* quality*/product* safe*"as key words, we find 10,694 reports in 2013 from financial analysts and the number in 2011 is 7,391.

[21] To save space, we do not report the insignificant results for the other four dimensions. The results are available from authors by request.

[22] We also separate concerns and strengths for the two categories. Consistent with the monitoring role of analysts, we find significant increases in environment concerns and product quality and safety concerns, while no significant change in strengths.

4. Exploring Potential Channels

Relying on two natural experiments that create exogenous shock in analyst coverage, we have established the negative causal effect of analyst coverage on firms' socially irresponsible behavior. We next attempt to explore the potential channels which enhance or mitigate the negative impact of exogenous analyst coverage drop on firms' CSR performance. We only report the results for Irresponsible Score and the results hardly change if we use Adjusted Irresponsible Score as dependent variables.

4.1 The Role of Initial Analyst Coverage

As we temp to study the role of financial analysts in shaping firms' involvement in irresponsible activities, a natural next step is to consider the impact of initial analyst coverage. Intuitively, the role of one financial analyst is more important when the firm is followed by a small group of analysts than when the firm is followed by a large group of financial analysts. Previous literature using the same settings also documents that the findings are mainly driven by firms with low initial analyst coverage. For example, Hong and Kacperczyk (2010) document that after experiencing an exogenous drop in analyst coverage, the analyst forecast bias is more substantial in firms with low analyst coverage than in those firms with high analyst coverage. Chen et al. (2015) find that the moral hazard issues only significantly increase in firms with low initial analyst coverage. Therefore, we expect our findings, i.e. the increase in socially irresponsible behavior, to be more profound in firms with low initial analyst coverage. In order to test the argument empirically, we partition the treated firms into two groups according to whether the treated firm has an initial analyst coverage higher than the median analyst coverage of our treated firm sample. And we interact the two groups of treated firms with dummy variable ($Post_{i,t}$) to capture the difference-in-differences coefficients for each groups, respectively.

[Insert Table 6 about here]

As shown in the first Column in Table 6, our difference-in-differences result is only significant in firms with low initial analyst coverage. The coefficient is 0.267, almost double of that in our baseline regression, significant at 1% level. For firms with high initial analyst coverage, the coefficient becomes much smaller in magnitude (0.045) and statistically insignificant. Our result confirms that the findings are mainly driven by low initial analyst coverage group and are consistent with previous studies using similar settings.

4.2 The Role of Corporate Governance

We further examine of the role of corporate governance in shaping firms' response in social irresponsibility to exogenous analyst drop. Corporate governance is an important mechanism in curbing the managerial misbehavior and reducing agency problems. The monitoring role of financial analysts is therefore less important for firms with strong corporate governance. Specifically, we partition the treated firms into two groups according to market competition level and the independence of the board. According to Shleifer and Vishny (1997), product market competition could be the most powerful mechanism in disciplining managers. Chen et al. (2015) also shows that the value-destroying activities induced by financial analyst loss could be mitigated by stronger product market competition. In our case, higher product market competition indicates that the products of the treated firms could be easily substituted by those of the peer firms, once the consumers find the firms are less responsible towards environment or towards their consumers. Consequently, we expect to find a more pronounced result in firms with concentrated product market structure. To test the prediction, we calculate the industrial Herfindal-Hirschman Index (HHI). For each two-digit SIC industry, *j*, we calculate the

concentration level of the sales for each year, *t*. A high HHI indicates that the industry is more concentrated and is less competitive.

$$HHI_{j,t} = \sum_1^N \left(\frac{Sales_{i,t}}{\sum_1^N Sales_{m,t}}\right)^2 . \qquad (2)$$

We then split our treated firms into high HHI group (less competitive) and low HHI group (more competitive). Then we interact the two groups of treated firms with $Post_{i,t}$ to capture the Difference-in-Difference-in-Differences (DIDID) results. The results are reported in Column (1) and (2), Table 7. For firms operating in more concentrated industries, the increase in irresponsible score is 0.252, significant at 1% level. The result for firms operating in competitive industries, however, is 0.059 and insignificant at any confidence level. We therefore confirm our hypothesis that our results are driven by firms operating in concentrated industries.

[Insert Table 7 about here]

In addition to product market competition, we also investigate the role of internal corporate governance. Specifically, we check whether our results are affected by board independence, which is documented to have a positive impact on firms' responsibly to the society (Harjoto and Jo, 2011). We partition the treated firms into two groups according to the ratio of independent directors in the board of directors.[23] As shown in Column (3) and (4), the result is only significant in firms with low board independence, the increase in irresponsible score is 0.300, significant at 5% level. For firms with better internal corporate governance, i.e. higher board independence, the coefficient on the interaction term is negative and insignificant.

4.3 The Role of Financial Constraints

[23] The sample size shrinks due to the coverage of BoardEx.

Our empirical results show that the exogenous loss of analysts lead to an increase in CSR concerns (irresponsible activities), which according to the interview by Fieseler (2011) leads to cost reduction in short-term but cost increase in the future. [24] According to Hong et al. (2012), firms would only do social goodness when they are doing well, i.e. financially unconstrained. Therefore, we predict that the increase in corporate socially irresponsible behavior should be more pronounced in firms with financial constraints, which limit firms' capability in being socially responsible and aggravate the myopic behavior of the managers.[25]

We adopt five measures to proxy for the financial condition of the treated firms, i.e. HP Index (Hadlock and Pierce, 2010), WW Index (Whited and Wu, 2006), Size, Age and Dividend Payment Dummy.

The HP index is constructed following Hadlock and Pierce (2010):

$$HP_{i,t} = -0.737 \times Size_{i,t} - 0.043 \times Size_{i,t}^2 - 0.040 \times Age_{i,t} \quad (3)$$

where Size equals the log of inflation-adjusted book assets (capped at the log of $4.5 billion) and Age is the number of years the firm is listed with a non-missing stock price data in Compustat (winsorized at thirty-seven years). A high HP index indicates that the firm is likely to be financially constrained. We then split the treated firms into High HP Index group and Low HP Index group according to whether the firm has an HP Index higher than the median of the treated sample. Then we interact the two groups with time dummy, $Post_{i,t}$. The results are tabulated in the Column (1) and (2), Panel A of Table 8.

[24] "Well, there are longer term costs as a consequence of irresponsible activities. If a company behaves in the most sustainable or environmentally friendly manner, then there will be fewer costs for the company to bear in the future. If you examine carbon dioxide trading in Europe, clearly there are mechanisms that can be put in place to penalize or make companies more accountable for their actions."

[25] For example, Cornaggia et al. (2015) document that after banking deregulation, the innovation of private firms, which are more financially constrained, increases significantly, indicating financial constraints might lead to managerial myopia.

[Insert Table 8 about here]

Consistent with our prediction, we only find significant results for firms with high HP index. The interaction term for high HP index group has a coefficient of 0.268, significant at 1% level. While the low HP index group has a coefficient of 0.046 on the interaction term.

We then construct our second measure of financial constraints, i.e. WW Index. We follow Whited and Wu (2006) and for each firm-year, we define WW Index according to the following equation.

$$WW_{i,t} = -0.091 \times \frac{CF_{i,t}}{AT_{i,t-1}} - 0.062 \times Dividend_{i,t} + 0.021 \times Leverage_{i,t} - 0.044 \times Log(AT_{i,t}) + 0.102 \times Industry\ Sales\ Growth_{i,t} - 0.035 \times Sales\ Growths_{i,t}$$

(4)

where CF is operating cash flow and AT is total assets. Dividend is an indicator equal to one if the firm pays cash dividends in the year and zero otherwise. Leverage is measured as total debt divided by total assets. Industry sales growth is the average sales growth of all firms in the three-digit SIC industry to which the firm belongs. Firms with a WW index above median are categorized as having high financial constraints. Column (3) and (4) in Panel A of Table 8 reports the regression results when we partition the treated groups into high and low WW index groups. Consistent with our argument, we find a significant result in high WW index group, while no significant change in low WW index group.

We further split our sample according to Size (smaller firms have tighter financial constraints) and whether the treated firms pay dividends in the year prior to the analyst coverage drop. The results are tabulated in Panel B in Table 8. For all these subsample

analysis, we confirm that the increase in irresponsible activities induced by exogenous analyst loss is only significant in firms with tighter financial constraints. Our findings are in line with the argument that financial constraints limit firms' capability in being socially responsible and lead to managerial myopia.

5. Conclusion

Relying on brokerage closures and mergers as natural experiments, we investigate whether financial analysts curb firms' socially irresponsible behaviors. Our difference-in-differences (DID) regression approach provides concrete evidence that the exogenous drop in financial analyst lead to an increase in irresponsible activities in impacted firms, compared with matched control firms. The results are robust to nearest-neighbor matching approach and will not change if we use different measures of irresponsible activities. By categorizing different irresponsible activities, we also find that financial analysts pay more attention to environmental issues and product safety and quality concerns.

Moreover, we point out potential channels through which the exogenous drop in financial analysts affects firms' engagement in socially irresponsible behavior. Consistent with previous literature using the same settings, we find our results are more pronounced in firms with low initial analyst coverage, lending support to our main results. We also investigate the effect of corporate governance. Consistent with our monitoring story, we only find significant increase in irresponsible activities in firms with weaker corporate governance, proxied by lower product market competition and lower board independence. Further we show that financial constraints could aggravate myopia and lead to more irresponsible behaviors. The results are consistent with Hong et al. (2012) that firms will only do good when they are doing well.

By documenting a negative causality from analyst coverage and corporate social irresponsibility, our paper contributes to the growing literature on the determinants on corporate social responsibility and sheds light on the importance of external monitoring in mitigating firms' socially irresponsible activities. These findings have particular implication for policy makers given the growing concerns about corporate social responsibility. In addition, our paper is the first to investigate the value of financial analysts to non-financial stakeholders. These findings further shed light on a novel channel through which financial analysts create firm value for shareholders, i.e. reducing potential risk and costs by curbing firms' irresponsible behavior.

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Figure 1: The Impact of Analysts on Irresponsible Activities

Figure 1a: The impact of analysts drop on Irresponsible Score

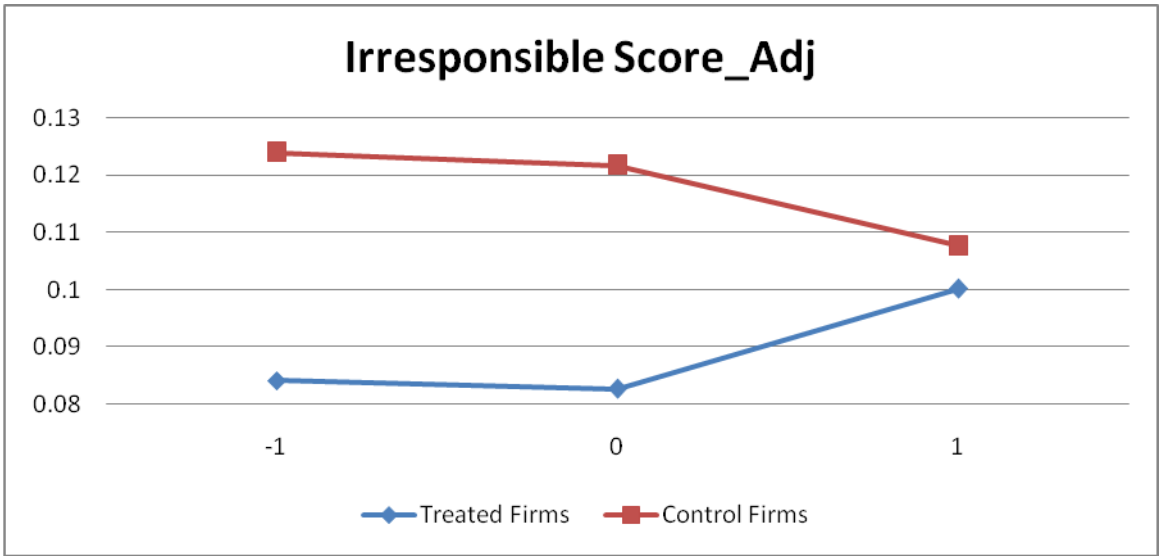

Figure 1b: The impact of analysts drop on Adjusted Irresponsible Score

Figure 2: The Impact of Analysts on Irresponsible Activities

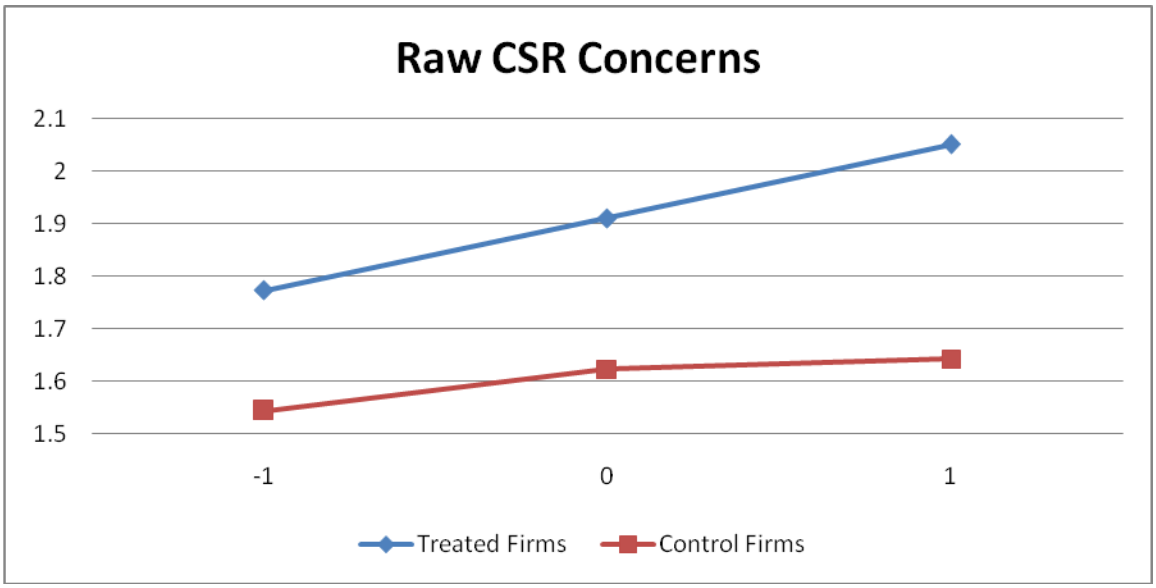

Figure 2a: The impact of analysts drop on CSR Concerns

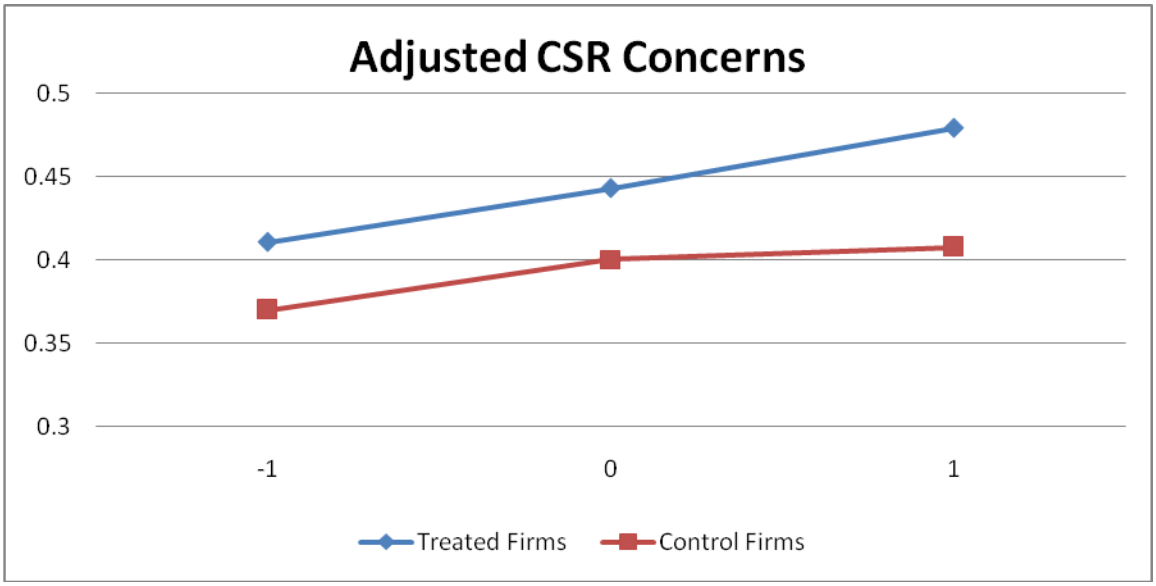

Figure 2b: The impact of analysts drop on CSR Concerns_Adj

Appendix A	
Variable Definitions	
	Definition
Irresponsible Score	For each category of community activities, diversity, employee relations, environmental record, human rights, and product quality and safety, we count the numbers of strengths and concerns within each of the six categories and then subtract the number of strengths from the number of concerns to construct the irresponsible score for each category each year. Then we sum up the irresponsible score of each category to obtain the overall irresponsible score for a certain firm each year. Source: KLD database
Irresponsible Score_Adj	The sum of yearly adjusted community activities, diversity, employee relations, environmental record, human rights, and product quality and safety Irresponsible Scores. Adjusted Irresponsible Score is estimated by scaling the raw strengths and concern scores of each category by the number of items of the strength and concerns of that category in the year and then taking the net difference between adjusted concern and strength scores for that category. Source: KLD database
Concerns	The sum of community activities, diversity, employee relationship, environmental record, human rights, and product quality and safety concerns. Source: KLD database
Concerns_Adj	The sum of adjusted community activities, diversity, employee relationship, environmental record, human rights, and product quality and safety concerns. Adjusted Concerns is estimated by scaling the raw concern scores of each category by the number of items of concerns of that category in the year Source: KLD database
Env. Irresponsible Score	Environmental Irresponsible Score is estimated by deducting environmental strengths from environmental concerns. Source: KLD database
Env. Irresponsible Score_Adj	Adjusted Environmental Irresponsible Score is estimated by deducting adjusted environmental strengths score from adjusted environmental concerns score. Source: KLD database
Prod. Irresponsible Score	Product Irresponsible Score is estimated by deducting product strengths from product concerns. Source: KLD database
Prod. Irresponsible Score_Adj	Adjusted Product Irresponsible Score is estimated by deducting adjusted product strengths score from adjusted product concerns score. Source: KLD database
Size	Log of total assets (item 6) of a firm. Source: Compustat

Q: Tobin's Q	Market value of assets over book value of assets: (item 6 − item 60 + item 25 × item 199)/item 6. Source: Compustat
Leverage	All debt (item 9 + item 34)/Total assets (item 6). Source: Compustat
Log(Analyst)	Log of analyst following in this year. Source: I/B/E/S
ROA	ROA is calculated as (item 13/item 6). Source: Compustat
Ret_std	60-month stock return volatility. Source: CRSP
Dividend	Dividend payout ratio. Source: Compustat
R&D	R&D expenses adjusted by total assets: (item 46/ item 6). Source: Compustat
SG&A	SG&A expenses adjusted by total assets: (item189/ item 6). Source: Compustat
Board Independence	# of independent directors divided by total # of directors on the board. Source: BoardEx
HHI	Herfindal-Hirschman index constructed according to three-digit SIC level based on sales (item12). HHI for each two-digit SIC industry in each year is computed according to the equation below. $HHI_{j,t} = \sum_{1}^{N} (\frac{Sales_{i,t}}{\sum_{1}^{N} Sales_{m,t}})^2$ Source: Compustat
HP Index	Hadlock and Pierce (2010) financial constraint index, with higher value indicating more financial constraint. $HP_{i,t} = -0.737 \times Size_{i,t} - 0.043 \times Size_{i,t}^2 - 0.040 \times Age_{i,t}$ Source: Compustat
WW Index	Whited and Wu (2006) financial constraint index, with higher value indicating more financial constraints. $WW_{i,t} = -0.091 \times \frac{CF_{i,t}}{AT_{i,t-1}} - 0.062 \times Dividend_{i,t} + 0.021 \times Leverage_{i,t} - 0.044 \times Log(AT_{i,t}) + 0.102 \times Industry\ Sales\ Growth_{i,t} - 0.035 \times Sales\ Growths_{i,t}$ Source: Compustat
Age	Number of years since the stock of the firm was firstly traded. Source: CRSP

Table 1 Summary Statistics

This table reports descriptive statistics for our irresponsible scores, irresponsible components, firm characteristics, and control variables for the sample used in the regression analysis. Irresponsible score is defined as the sum of community activities, diversity, employee relations, environment record, human rights, and product quality and safety irresponsible scores. Adjusted Irresponsible Score is the sum of yearly adjusted community activities, diversity, employee relations, environment record, human rights, and product quality and safety irresponsible scores. Detailed definitions could be found in Appendix A. Our sample covers 6,260 unique firm-years over the period of 1999 to 2011, from 1,538 unique U.S. public firms. All variables are winsorized at 1% and 99% level.

	Obs	Mean	Std	P25	Median	P75
Irresponsible Score	6260	-0.27	2.67	-1.00	0.00	1.00
Irresponsible Score_adj	6260	0.11	0.50	-0.13	0.13	0.36
Concerns	6260	1.70	1.92	0.00	1.00	2.00
Concerns_adj	6260	0.41	0.43	0.00	0.33	0.53
Strengths	6260	8.92	1.69	8.00	8.00	9.00
Strengths_adj	6260	0.30	0.43	0.00	0.14	0.42
Env Irresponsible Score	6260	0.02	0.81	0.00	0.00	0.00
Env Irresponsible Score_adj	6260	0.00	0.13	0.00	0.00	0.00
Pro Irresponsible Score	6260	0.25	0.74	0.00	0.00	0.00
Pro Irresponsible Score_adj	6260	0.06	0.19	0.00	0.00	0.00
Size	6260	8.00	1.84	6.68	7.89	9.20
Market to Book	6260	2.18	1.51	1.18	1.66	2.61
Leverage	6260	0.20	0.20	0.03	0.16	0.30
Log (Anacov)	6260	2.34	0.72	1.90	2.46	2.90
ROA	6260	0.12	0.12	0.05	0.12	0.18
Stock Return Volatility	6260	0.13	0.07	0.08	0.11	0.16
Dividends	6260	0.01	0.02	0.00	0.00	0.01
R&D	6260	0.04	0.07	0.00	0.00	0.06
SG&A	6260	0.20	0.20	0.02	0.15	0.30

Table 2 The Impact of Exogenous Analyst Coverage Reduction on Irresponsible Score: Baseline Regression

This table reports results of OLS regressions examining the effect of exogenous drop in financial analysts on firms' irresponsible activities. Our sample consists of 6,260 unique firm-years over the period of 1999 to 2011, from 1,538 unique U.S. public firms. Our sample includes 1,938 treated firm-years. Control firms are matched according to Fama-French 48 industry classification, year, and Size, Q, and Analyst Coverage tercile. Columns (1)-(3) examine the impact of analyst drop on firms' Irresponsible Score with different model specifications. Columns (4)-(6) examine the impact of analyst drop on firms' Adjusted Irresponsible Score with different model specifications. Treated is a dummy variable equal to 1, if the firm has experienced an exogenous drop in analyst coverage, zero otherwise. Post is a dummy equal to 1 for the first year after the shock; and equal to 0 for the last year before the shock. Definitions for other variables are given in Appendix A. The estimations correct error structure for heteroskedasticity and within-firm error clustering, with standard errors reported in brackets. *, **, and *** denote statistical significance at 10%, 5% and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable	Irresponsible Score	Irresponsible Score	Irresponsible Score	Irresponsible Score_adj	Irresponsible Score_adj	Irresponsible Score_adj
Treated* Post	0.168**	0.162**	0.155**	0.035**	0.034**	0.032**
	[0.069]	[0.070]	[0.069]	[0.015]	[0.015]	[0.015]
Treated	0.002	0.001	0.001	0.001	0.000	0.000
	[0.071]	[0.071]	[0.071]	[0.014]	[0.014]	[0.014]
Post	-0.182***	-0.172***	-0.191***	-0.018	-0.015	-0.019
	[0.048]	[0.051]	[0.052]	[0.011]	[0.011]	[0.012]
Size	0.054	0.065	0.174	0.013	0.016	0.039
	[0.121]	[0.120]	[0.126]	[0.024]	[0.024]	[0.025]
M-to-B	0.032	0.040	0.043	0.008	0.010	0.011
	[0.034]	[0.034]	[0.033]	[0.007]	[0.007]	[0.007]
Lev	0.311	0.270	0.344	0.031	0.020	0.035
	[0.341]	[0.341]	[0.348]	[0.071]	[0.071]	[0.072]
ROA		-0.444	-0.199		-0.104	-0.059
		[0.517]	[0.541]		[0.102]	[0.106]
Ret_Std		0.844	0.982		0.274	0.303
		[0.938]	[0.957]		[0.208]	[0.211]
Dividend			-2.156			-0.385
			[2.281]			[0.450]
R&D			2.591*			0.482
			[1.521]			[0.302]
SG&A			0.786*			0.174*
			[0.435]			[0.091]
Constant	-0.790	-0.942	-2.082**	-0.158	-0.212	-0.447**
	[0.917]	[0.919]	[1.048]	[0.178]	[0.180]	[0.206]
Firm Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6,260	6,260	6,260	6,260	6,260	6,260
Adjusted R-squared	0.781	0.782	0.783	0.709	0.709	0.710

Table 3 The Impact of Exogenous Analyst Coverage Reduction on Irresponsible Score: Evidence from Nearest Neighbor Matching (ATT)

This table presents difference-in-differences estimates (ATT) for the changes in Irresponsible Score and Adjusted Irresponsible Score following the exogenous reductions in analyst following. Our sample size ranges from 1039 to 1018 with different matching combinations. ATT is the Abadie and Imbens (2006) bias corrected average treated effect matching estimator. Panel A and Panel B report the matching estimates for change in Irresponsible Score and Adjusted Irresponsible Score, respectively. We require the treated firms and matched control firms to be in the same Fama-French 48 industry and same year. For each treated firm, we find its nearest control firm according to different matching criteria. Variable definitions are in Appendix A. Heteroskedasticty-consistent T-statistics are reported in brackets below the estimates. *, **, and *** denote statistical significance at 10%, 5% and 1% level, respectively.

Panel A: Irresponsible Score

Matching Variables	Obs	Irresponsible Score_DIF Treated	Irresponsible Score _DIF Control	ATT (treatment vs. control)	t-stat
Size/Q/Anacov	1039	0.07	-0.03	0.11*	1.69
Size/Q/Lev/Anacov	1037	0.07	-0.07	0.15**	2.47
Size/Q/Anacov/ROA	1021	0.07	-0.03	0.12*	1.90
Size/Q/Lev/Anacov/ROA	1019	0.07	-0.08	0.16***	2.77
Size/Q/Lev/Anacov/ROA/Dividend	1018	0.07	-0.04	0.14**	2.40
Size/Q/Lev/Anacov/ROA/R&D/SG&A	1019	0.07	-0.04	0.13**	2.33

Panel B: Irresponsible Score_Adj

Matching Variables	Obs	Irresponsible Score_Adj _DIF Treated	Irresponsible Score_Adj _DIF Control	ATT (treatment vs. control)	t-stat
Size/Q/Anacov	1039	0.03	0.01	0.03**	2.02
Size/Q/Lev/Anacov	1037	0.03	0.00	0.03***	2.74
Size/Q/Anacov/ROA	1021	0.03	0.01	0.03**	2.08
Size/Q/Lev/Anacov/ROA	1019	0.03	0.00	0.04***	3.00
Size/Q/Lev/Anacov/ROA/Dividend	1018	0.03	0.01	0.03***	2.62
Size/Q/Lev/Anacov/ROA/R&D/SG&A	1019	0.03	0.01	0.03***	2.68

Table 4 Robustness: The Impact of Exogenous Analyst Coverage Reduction on Concerns and Strengths

This table presents the impact of exogenous drop in analyst coverage on irresponsible activities (CSR concerns) and responsible activities (CSR strengths), respectively. Column (1) and Column (2) show the impacts the exogenous drop in analyst coverage on the Raw CSR Strengths Score and on the Adjusted CSR Strengths Score, respectively. Column (3) and Column (4) show the impacts the exogenous drop in analyst coverage on the Raw CSR Concerns Score and on the Adjusted CSR Concerns Score, respectively. Our sample consists of 6,260 unique firm-years over the period of 1999 to 2011, from 1,538 unique U.S. public firms. Our sample includes 1,938 treated firm-years. Control firms are matched according to Fama-French 48 industry classification, year, and Size, Q, and Analyst Coverage tercile. Variable definitions are in Appendix A. Heteroskedasticty-consistent T-statistics are reported in brackets below the estimates. *, **, and *** denote statistical significance at 10%, 5% and 1% level, respectively.

	(1)	(2)	(3)	(4)
Dependent variable	Concerns	Concerns_adj	Strengths	Strengths_adj
Treated* Post	0.167***	0.028**	0.039	-0.004
	[0.048]	[0.012]	[0.042]	[0.009]
Treated	-0.067	-0.013	-0.061	-0.013
	[0.049]	[0.012]	[0.047]	[0.010]
Post	0.090***	0.040***	0.023	0.059***
	[0.032]	[0.008]	[0.033]	[0.008]
Size	0.206**	0.040**	0.013	0.002
	[0.083]	[0.020]	[0.090]	[0.019]
M-to-B	0.035*	0.010**	-0.043*	-0.001
	[0.021]	[0.005]	[0.023]	[0.005]
Lev	0.139	0.011	0.143	-0.025
	[0.225]	[0.057]	[0.189]	[0.047]
ROA	-0.543	-0.095	0.048	-0.036
	[0.377]	[0.085]	[0.365]	[0.072]
Ret_Std	1.753***	0.571***	-1.290**	0.268**
	[0.605]	[0.162]	[0.536]	[0.124]
Dividend	-1.378	-0.333	1.302	0.052
	[1.812]	[0.420]	[1.470]	[0.324]
R&D	1.243*	0.291	-0.535	-0.191
	[0.748]	[0.181]	[1.092]	[0.199]
SG&A	0.378	0.066	-0.339	-0.108*
	[0.304]	[0.075]	[0.266]	[0.055]
Constant	-1.649**	-0.346**	8.676***	0.104
	[0.682]	[0.165]	[0.718]	[0.152]
Firm Fixed Effect	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes
Observations	6,260	6,260	6,260	6,260
Adjusted R-squared	0.825	0.784	0.793	0.832

Table 4 Robustness: The Impact of Exogenous Analyst Coverage Reduction on Concerns (Continued)

Panel B : Concerns NN Match Results

Matching Variables	Obs	Concerns_DIF Treated	Concerns_DIF Control	ATT (treatment vs. control)	t-stat
Size/Q/Anacov	1039	0.21	0.06	0.14***	3.59
Size/Q/Lev/Anacov	1037	0.21	0.05	0.15***	3.87
Size/Q/Anacov/ROA	1021	0.20	0.07	0.14***	3.58
Size/Q/Lev/Anacov/ROA	1019	0.21	0.06	0.15***	3.64
Size/Q/Lev/Anacov/ROA/Dividend	1018	0.21	0.07	0.14***	3.51
Size/Q/Lev/Anacov/ROA/R&D/SG&A	1019	0.21	0.07	0.15***	3.61

Panel C: Concerns_Adj NN Match Results

Matching Variables	Obs	Concerns_adj_DIF Treated	Concerns_adj_DIF Control	ATT (treatment vs. control)	t-stat
Size/Q/Anacov	1039	0.05	0.02	0.03***	3.26
Size/Q/Lev/Anacov	1037	0.05	0.02	0.04***	3.53
Size/Q/Anacov/ROA	1021	0.05	0.02	0.03***	3.18
Size/Q/Lev/Anacov/ROA	1019	0.05	0.02	0.04***	3.44
Size/Q/Lev/Anacov/ROA/Dividend	1018	0.05	0.01	0.02***	3.28
Size/Q/Lev/Anacov/ROA/R&D/SG&A	1019	0.05	0.02	0.04***	3.42

Table 5 The Impact of Analysts on Irresponsible Score: Component Analysis

This table presents the impact of exogenous drop in analyst coverage on different components of Irresponsible Score. We only report the regressions with significant results. Our sample consists of 6,260 unique firm-years over the period of 1999 to 2011, from 1,538 unique U.S. public firms. Our sample includes 1,938 treated firm-years. Control firms are matched according to Fama-French 48 industry classification, year, and Size, Q, and Analyst Coverage tercile. Variable definitions are in Appendix A. Heteroskedasticty-consistent T-statistics are reported in brackets below the estimates. *, **, and *** denote statistical significance at 10%, 5% and 1% level, respectively.

Dependent variable	(1) Env Irresponsible Score	(2) Env Irresponsible Score_adj	(3) Pro Irresponsible Score	(4) Pro Irresponsible Score_adj
Treated* Post	0.060**	0.009**	0.040*	0.011*
	[0.026]	[0.004]	[0.022]	[0.006]
Treated	-0.018	-0.002	0.011	0.003
	[0.026]	[0.004]	[0.024]	[0.006]
Post	-0.162***	-0.026***	-0.012	-0.005
	[0.020]	[0.003]	[0.014]	[0.004]
Size	0.121***	0.018***	0.076**	0.019*
	[0.040]	[0.006]	[0.038]	[0.010]
M-to-B	0.013	0.002	-0.007	-0.002
	[0.012]	[0.002]	[0.010]	[0.003]
Lev	0.082	0.013	0.046	0.014
	[0.121]	[0.020]	[0.102]	[0.026]
ROA	-0.118	-0.019	0.001	-0.000
	[0.199]	[0.031]	[0.151]	[0.038]
Ret_Std	-0.726**	-0.125***	-0.012	-0.030
	[0.291]	[0.048]	[0.279]	[0.072]
Dividend	-0.113	-0.012	-0.223	-0.041
	[0.797]	[0.129]	[1.219]	[0.305]
R&D	0.475	0.068	0.262	0.063
	[0.454]	[0.073]	[0.309]	[0.078]
SG&A	0.391***	0.065***	0.137	0.039
	[0.129]	[0.021]	[0.105]	[0.027]
Constant	-0.687**	-0.106**	-0.712**	-0.171**
	[0.328]	[0.052]	[0.329]	[0.083]
Firm Fixed Effect	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes
Observations	6,260	6,260	6,260	6,260
Adjusted R-squared	0.700	0.667	0.758	0.744

Table 6The Impact of Analysts on Irresponsible Score: The role of Initial Analyst Coverage

This table reports results of OLS regressions examining the effect of exogenous drop in financial analysts on firms' Irresponsible Score conditional on the initial analyst coverage of the treated firms before the shock. In Columns (1)-(2), we split our treated firms according to whether the firm has an initial analyst coverage below or above the median initial analyst coverage of the treated firm sample. In Columns (3)-(4), we split our treated firms according to whether the firm has an initial analyst coverage in the bottom tercile or in the top tercile of the treated firm sample. Control variables include Size, Market-to-Book, Leverage, ROA, Ret_vol, Dividends, R&D expenses, and SG&A expenses. Definitions for other variables are given in Appendix A. The estimations correct error structure for heteroskedasticity and within-firm error clustering, with standard errors reported in brackets. *, **, and *** denote statistical significance at 10%, 5% and 1% level, respectively.

	(1)	(2)	(3)	(4)
Dependent variable	Irresponsible Score	Irresponsible Score_Adj	Irresponsible Score	Irresponsible Score_Adj
Treated (Analyst Coverage<Median)*Post	0.267***	0.048***		
	[0.078]	[0.017]		
Treated (Analyst Coverage>=Median)*Post	0.045	0.017		
	[0.098]	[0.022]		
Treated (Analyst Coverage <Bottom Tercile)* Post			0.302***	0.060***
			[0.086]	[0.019]
Treated (Analayst Coverage>=Top Tercile)*Post			0.122	0.039
			[0.126]	[0.028]
Treat (Analyst Coverage<Median)	-0.123	-0.021		
	[0.099]	[0.020]		
Treated (Analyst Coverage>=Median)	0.100	0.016		
	[0.092]	[0.018]		
Treat (Analyst Coverage<Bottom Tercile)			-0.202*	-0.037
			[0.122]	[0.025]
Treated (Analyst Coverage>=Top Tercile)			-0.008	-0.010
			[0.122]	[0.024]
Post	-0.190***	-0.019	-0.185***	-0.019*
	[0.052]	[0.012]	[0.049]	[0.011]
Controls	Yes	Yes	Yes	Yes
Firm Fixed Effect	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes
Observations	6,260	6,260	6,260	6,260
Adjusted R-squared	0.783	0.710	0.783	0.710

Table 7 The Impact of Analysts on Irresponsible Score: The role of Corporate Governance

This table reports results of OLS regressions examining the effect of exogenous drop in financial analysts on firms' Irresponsible Score conditional on corporate governance before the shock. We investigate four proxies for corporate governance including product market competition (HHI) and board independence before the shock. Specifically, in Columns (1)-(2), we split our treated firms according to whether it operates in an industry with HHI above or below the median industrial-HHI of the treated firm sample. In Columns (3)-(4), we split our treated firms according to whether it has a board independence below or above the median board independence of the treated firm sample. Control variables include Size, Market-to-Book, Leverage, ROA, Ret_vol, Dividends, R&D expenses, and SG&A expenses. Detailed definitions are given in Appendix A. The estimations correct error structure for heteroskedasticity and within-firm error clustering, with standard errors reported in brackets. *, **, and *** denote statistical significance at 10%, 5% and 1% level, respectively.

	(1)	(2)	(3)	(4)
Dependent variable	Irresponsible Score	Irresponsible Score_Adj	Irresponsible Score	Irresponsible Score_Adj
Treated (HHI>Median)*Post	0.252***	0.053***		
	[0.087]	[0.019]		
Treated (HHI<=Median)*Post	0.059	0.012		
	[0.091]	[0.020]		
Treated (Board Independence<Median)*Post			0.300**	0.063**
			[0.127]	[0.027]
Treated (Board Independence>=Median)*Post			-0.048	0.005
			[0.151]	[0.033]
Treated (HHI>Median)	-0.038	-0.011		
	[0.106]	[0.021]		
Treated (HHI<=Median)	0.040	0.011		
	[0.085]	[0.017]		
Treated (Board Independence<Median)			-0.006	0.002
			[0.178]	[0.037]
Treated (Board Independence>=Median)			0.240	0.053*
			[0.157]	[0.030]
Post	-0.191***	-0.019	-0.261***	-0.038**
	[0.052]	[0.012]	[0.076]	[0.017]
Controls	Yes	Yes	Yes	Yes
Firm Fixed Effect	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes
Observations	6,260	6,260	3,202	3,202
Adjusted R-squared	0.783	0.710	0.809	0.742

Table 8 The Impact of Analysts on Irresponsible Score: The role of Financial Constraints

This table reports results of OLS regressions examining the effect of exogenous drop in financial analysts on firms' Irresponsible Score conditional on financial constraints before the shock. We investigate four proxies for financial constraints including HP Index (Hadlock and Pierce, 2010), WW Index (Whited and Wu, 2006), Size, and Dividend payment dummy. In Columns (1)-(2), Panel, A, we split our treated firms according to whether it has an HP index above or below the median HP index of the treated sample. In Columns (3)-(4), we split our treated firms according to whether it has a WW index above or below the median WW index of the treated sample. In Columns (1)-(2), Panel B, we split our treated firms according to whether it has a Size below or above the median Size of the treated sample. And in Columns (3)-(4), Panel B, we split our treated firms according to whether it distributes dividends or not in year *t-1*.Control variables include Size, Market-to-Book, Leverage, ROA, Ret_vol, Dividends, R&D expenses, and SG&A expenses. Definitions for other variables are given in Appendix A. The estimations correct error structure for heteroskedasticity and within-firm error clustering, with standard errors reported in brackets. *, **, and *** denote statistical significance at 10%, 5% and 1% level, respectively.

Panel A: The role of financial constraints (HP Index & WW Index)				
	(1)	(2)	(3)	(4)
Dependent variable	Irresponsible Score	Irresponsible Score_Adj	Irresponsible Score	Irresponsible Score_Adj
Treated (HP Index>Median)*Post	0.268***	0.050***		
	[0.077]	[0.017]		
Treated (HP Index<=Median)*Post	0.046	0.015		
	[0.101]	[0.022]		
Treated (WW Index>Median)*Post			0.227***	0.043***
			[0.075]	[0.017]
Treated (WW Index<=Median)*Post			0.059	0.014
			[0.102]	[0.022]
Treated (HP Index>Median)	0.052	0.007		
	[0.092]	[0.019]		
Treated (HP Index<=Median)	-0.034	-0.004		
	[0.104]	[0.020]		
Treated (WW Index>Median)			-0.045	-0.014
			[0.094]	[0.018]
Treated (WW Index<=Median)			0.073	0.021
			[0.108]	[0.021]
Post	-0.190***	-0.019	-0.195***	-0.020
	[0.052]	[0.012]	[0.053]	[0.012]
Controls	Yes	Yes	Yes	Yes
Firm Fixed Effect	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes
Observations	6,260	6,260	6,260	6,260
Adjusted R-squared	0.783	0.710	0.783	0.712

Panel B: The role of financial constraints (Size & Dividend)				
	(1)	(2)	(3)	(4)
Dependent variable	Irresponsible Score	Irresponsible Score_Adj	Irresponsible Score	Irresponsible Score_Adj
Treated (Size<Median)*Post	0.248***	0.044***		
	[0.075]	[0.017]		
Treated (Size>=Median)*Post	0.065	0.021		
	[0.103]	[0.023]		
Treated (Dividend Dummy=0)*Post			0.174**	0.037**
			[0.080]	[0.018]
Treated (Dividend=1)*Post			0.126	0.026
			[0.101]	[0.022]
Treated (Size<Median)	-0.075	-0.020		
	[0.098]	[0.019]		
Treated (Size>=Median)	0.068	0.017		
	[0.103]	[0.020]		
Treated (Dividend Dummy=0)			0.009	-0.000
			[0.089]	[0.018]
Treated (Dividend=1)			-0.012	-0.001
			[0.120]	[0.022]
Post	-0.189***	-0.018	-0.193***	-0.019*
	[0.052]	[0.012]	[0.052]	[0.012]
Controls	Yes	Yes	Yes	Yes
Firm Fixed Effect	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes
Observations	6,260	6,260	6,260	6,260
Adjusted R-squared	0.783	0.710	0.783	0.711