Does Analyst Coverage Affect Workplace Safety?[*]

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Abstract

Consistent with the monitoring role of analysts, we find work-related injury rates are negatively related to higher levels of analyst coverage. This result is robust to approaches designed to mitigate endogeneity concerns and is stronger in industries where unions are less powerful, for firms followed by all-star analysts and in the presence of more local analysts. Firms with greater analyst coverage are more likely to adopt safety clauses in CEO compensation contracts, are rated higher in workplace safety culture, invest more in safety and management is more likely to discuss safety issues during earnings conference calls. Our results suggest analysts have a subtle yet important impact on employee welfare.

JEL Classification: G24; G30; J28; K32

Keywords: workplace safety, employee welfare, analyst coverage, analyst monitoring, managerial incentive

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1. Introduction

Academic work and the practitioner world generally support the view that security analysts have an impact on stock prices (i.e., Jegadeesh et al., 2004; Chang, Dasgupta, and Hilary, 2006, etc.) and emerging research indicates that analysts also influence firm policies (i.e., Derrien and Kecskes, 2013; He and Tian, 2013; Chen, Harford and Lin, 2015). In this paper, we examine how analysts may impact an important corporate policy that has received little attention in the literature—worker safety. The economic consequences to US productivity losses from safety-related incidents are enormous. Every year more than 3.5 million workplace injuries happen in the U.S. at a cost estimated around $250 billion, well above the cost of all forms of cancer combined (Leigh, 2011).[1] Interest in corporate social responsibility (CSR) has exploded over the past few years and worker safety is viewed as one of many components of a firm's overall CSR policy.[2] Thus, worker safety has important economic and social welfare consequences.

Analysts have valid reasons to pay attention to firms' safety policies because the cash flow implications can have a significant impact on shareholder wealth. Empirically, Cohn and Wardlaw (2016) document that workplace injury rates are negatively (economically and statistically) related to firm value. Companies must weigh investments in costly, and oftentimes discretionary safety measures versus the costs related to safety incidents. While firm-level investments in worker safety is difficult to pin down because disclosure is not mandatory, they can be substantial. For instance, take the case of Patterson-UTI Drilling Co. (an oil and drilling firm), which estimates that over the decade spanning 2001-2010, it spent the equivalent to 7% of its total income and 32% of its SG&A expenses on worker safety.[3,4] While these investments are large, failure to make adequate investments in safety can have significant consequences. For instance, costs could arise from labor productivity losses, legal-related expenses to injury/death cases, regulatory fines, or from

[1] Leigh (2011) reports that medical cost estimates were $67 billion and indirect costs were approximately $183 billion.
[2] Data on worker safety only recently became public domain and easily accessible, which is the most likely explanation for the paucity of research.
[3] Source: http://www.mysanantonio.com/news/energy/article/Eagle-Ford-pay-is-high-but-workcan-be-fatal-4285405.php.
[4] Consistent with Patterson's case, firms generally spend an economically large amount of profits to comply with OSHA safety requirement. According to the U.S. Bureau of Economic Analysis, companies spent between $52 and $66 billion complying with OSHA regulations in 2010 (Kniesner and Leeth, 2014), which is equivalent to about four to five percent of the $1,351 billion domestic corporate profits.

reputational costs and potential backlash from politicians, activist investors or labor, or from negative publicity associated with injury/death events.[5]

On occasion, analysts do explicitly comment on safety related matters in their reports. These can range from discussions of firm-level injury rates to the impact of more severe disasters. For example, a Morgan Stanley analyst issued a report on Te Connectivity Ltd on January 11, 2017, praising the company's improvement in safety: "Recordable incident rate was 0.26 per 100 employees in 2015, down from 0.47 in 2011 and more than one-third of manufacturing plants operated injury free." On the other hand, in February 2010, Jefferies & Company continued their coverage of an explosion at one of West Pharmaceutical's plants in January 2003 that continues to burden the firm: "On January 29, 2003, West's Kinston, North Carolina plant suffered an explosion resulting in six deaths, several injuries, and substantial damage." Management also frequently discusses safety in the quarterly earnings conference calls. Indeed, as we describe later, we perform textual analysis of safety-related discussion in earnings conference calls and provide empirical evidence linking analyst coverage to such discussion.

Ex ante it is not clear what impact analysts may have, if any, with respect to worker safety. We propose two competing hypotheses with opposite empirical predictions that rely on the extant analyst literature.[6] Analysts are known to possess comparative advantages in monitoring and mitigating managers' self-serving behavior (Jensen and Meckling, 1976). For instance, evidence shows that analysts are associated with reductions in earnings management (Yu, 2008), better financial reporting quality (Irani and Oesch, 2013) and declines in value-reducing acquisitions (Chen, Harford, and Lin, 2015). Other evidence suggests that analysts often first identify corporate wrongdoing. For example, Dyck, Morse, and Zingales (2010) find that analysts are whistle-blowers for 16.9% of the corporate fraud cases during the period of 1996-2004 and Khanna, Kim, and Lu (2015) documented that fraud is detected sooner in the presence of greater analyst coverage. Thus, it is plausible that greater analyst presence leads firms to improve their working conditions as they

[5] Tesla has received repeated unfavorable press attention for its abnormally high safety incidents with workers claiming that 'factory safety is worse than slaughterhouses and sawmills.' In more severe cases, safety issues cause full blown public relations and legal disasters like the BPs 2010 Deepwater Horizon oil rig explosion that killed 11 people. https://www.cnbc.com/2017/08/01/tesla-workers-complain-about-factory-safety.html.

[6] It is worth noting that neither explanation we propose presumes that analysts 'care' per se about the social welfare consequences of worker safety. Rather, we assume that they are more concerned about the cash flow, risk and reputation implications, and if analysts are indeed associated with changes in safety, these welfare consequences are likely to be unintended consequences.

become scrutinized more heavily to avoid the negative consequences of operating plants with abnormally high safety incident rates. We term this the *monitoring hypothesis*.[7]

An alternative view focuses on the dark side of financial analysts, whereby they create excessive short-term pressure on managers through earnings forecasts and thus aggravating managerial myopia. For example, Bartov, Givoly, and Hayn (2002) find that firms that meet or beat earnings expectations are rewarded by the market with higher-than-peer stock returns in the short run. As such, managers strive to meet or beat analyst forecasts (Bhojraj et al., 2009; Doyle, Jennings, and Soliman, 2013). The short-term pressure of meeting or beating analyst forecasts, may distort managers' investments and disclosure behavior, pushing them to forgo value-increasing long-term projects and manipulate earnings. He and Tian (2013) document that analysts hinder corporate innovation by exerting excessive pressure on managers to meet short-term earnings goals. Perhaps most closely related to our paper and consistent with this view, Caskey and Ozel (2017) show that injury/illness rates are higher in firms that meet or just beat analyst forecasts when compared to firms that miss or beat forecasts by a larger margin. They find that higher injury rates are associated with increased employee workloads and cuts in safety expenditures. If more analysts put greater short-term pressure on management to meet or beat earnings estimates, then managers may use cuts in discretionary safety investments to do so. We term this the *pressure hypothesis*.

We obtain establishment-level workplace safety data from the Occupational Safety Health Administration (OSHA), which regulates workplace safety for most private sector employers in the U.S. Under the OSHA Data Initiative Program (ODI) that remained active until 2011, OSHA surveyed private-sector establishments and collected data on reportable injuries and illnesses attributable to work-related activities. Analyst data are from I/B/E/S. We start our analysis by investigating the relationship between injury rates and analyst coverage.

Using a sample of 31,336 establishment-year observations during 2002-2011, we find a robust negative relationship between work-related injury rates and analyst coverage after controlling for establishment-level and firm-level characteristics. Our specifications include industry, year, establishment, firm, year-industry, and year-state fixed effects suggesting that the results are not driven by unobserved firm- or establishment-level heterogeneity. When analyst coverage increases

[7] Christensen et al. (2017) suggest that increased public awareness following regulatory changes requiring mandatory safety disclosures in mining firms' financial statements has real effects on the market's reaction to safety citations and mutual fund holdings. In other words, increased public disclosure of safety-related issues brings more attention, which has negative real effects on stock prices. Viewed through the monitoring hypothesis, greater analyst presence would likewise predict firm-level safety improvements.

from the 25th percentile to the 75th percentile, injury rates drop by 1.27, which corresponds to a 16.4% reduction from the mean level. Overall, these results are consistent with the *monitoring hypothesis*.

We employ two approaches to address endogeneity concerns. First, we take advantage of two quasi-natural experiments often used in this line of research − brokerage closures (Kelly and Ljungqvist, 2012) and brokerage mergers (Hong and Kacperczyk, 2010), which create plausible exogenous shocks to analyst coverage but do not directly impact workplace safety. We follow the method adopted in He and Tian (2013), Irani and Oesch (2013), and Chen, Harford, and Lin (2015) and conduct difference-in-differences (DiD) tests where treated establishments experience an exogenous decrease in analyst coverage due to brokerage closures and mergers and are compared to control establishments that are selected to be similar to the treated establishments across various firm- and establishment-level characteristics. Compared to control establishments, workplace injury rates rise significantly in treated establishments following the shocks. Economically, workplace injury rates are 33.2% higher for treatment establishments relative to the controls. Second, we follow Yu (2008), He and Tian (2013), and Guo et al. (2018) to construct expected analyst coverage as an instrumental variable and run two-stage least square (2SLS) regressions. The IV results are also robust.

We next examine some cross-sectional implications of our results. First, we find that analysts have a greater influence on firms from industries with low union bargain power. When union protection is weak, the incremental impact of analysts on safety is high suggesting that analysts appear to substitute for union goals. Second, we show that all-star analyst coverage enhances workplace safety further beyond a firm's overall analyst coverage does, suggesting that analysts' skill and reputation may play a pivotal role in their monitoring of corporate workplace safety. Third, we find that local analysts have a greater impact on safety than distant analysts. This finding supports the view that local analysts provide stronger monitoring because of their geographic advantage. These analysts are likely to make more frequent site visits, talk to customers, local OSHA administrators, etc. to gather first-hand information (Malloy, 2005; Cheng, Du, Wang and Wang, 2016).

In the last part of our paper, we touch on plausible mechanisms for our results. We posit three testable channels: safety incentives in managerial compensation, firms' workplace safety culture, and safety investments. We document that firms with greater analyst coverage are more likely to incorporate performance metrics related to workplace safety in their executive compensation schemes. Since managers are incentivized through compensation contracts, they would pay more attention to workplace safety and engage in actions to improve it. We also find that more analyst coverage is related to an overall higher rating in workplace safety culture and environment suggesting that analysts' impact externalizes beyond C-suite executives applying also to mid-rank managers as well as rank file employees to improve workplace conditions. Consistent with the evidence from managerial compensation and workplace safety culture, we also find more analyst coverage induces firms to invest more in workplace safety. Finally, we try to establish some direct evidence on how analyst coverage affects managerial behavior with respect to worker safety. Through extensive analysis using conference call transcripts, we find that management and analysts are more likely to discuss safety-related issues when analyst coverage is higher.

Our paper contributes to two distinct strands of literatures. First, we add to the nascent literature on workplace safety and employee welfare. Cohn, Nestoriak, and Wardlaw (2017) document a significant reduction in workplace injury rates post-private equity buyouts of publicly-traded firms. This decline can be attributed to alleviating the pressure managers are under to focus on short-term outcomes, pressure which may compromise workplace safety. Our paper is related to the recent work of Caskey and Ozel (2017), which reveals a negative relation between workplace safety and managers' attempt to meet/beat analysts' earnings forecast, consistent with the explanation in Cohn, Nestoriak and Wardlaw (2017). Their study is not about analyst coverage per se, but instead focuses on managers' desire to beat earnings forecasts through real earnings management (cutting investments in worker welfare). In contrast, our paper emphasizes how and by what channel analyst coverage broadly affects workplace safety. Most importantly, we find strong and robust evidence that analyst coverage *enhances* workplace safety, after controlling for managers' attempt to meet/beat earnings forecast, supporting the *monitoring hypothesis*.[8] Since financial analysts specialize in information production and monitoring, they are natural candidates for potentially impacting on such type of behavior. Collectively, our evidence suggests that analysts indeed influence worker safety, whereby positive welfare consequences may have been unintended.

Second, our paper complements recent studies examining the bright side of security analysts—the information/monitoring role played by analysts. Yu (2008) finds that firms are involved with less earnings management when they are followed by more analysts. Irani and Oesch (2013) present evidence that financial reporting becomes less informative as analyst coverage declines and Chen, Harford, and Lin (2015) document that analyst coverage can mitigate managerial expropriation of

[8] Finally, the use of exogenous shocks in analyst coverage from brokerage house closures and mergers allows us to move closer to identifying a causal effect, which is not possible in the framework of studying the managerial desire to beat earnings consensus forecasts.

outside shareholders. Guo et al. (2018) document that security analysts encourage firms to make more efficient investments in innovation, leading to greater numbers of patents and citations as well as more novel innovations.

The rest of the paper is organized as follows. Section 2 describes the data and summary statistics. Section 3 presents the main empirical results and attempts to mitigate endogeneity concerns. Section 4 examines cross-sectional implications of our results and section 5 addresses plausible mechanisms. Finally, section 6 concludes.

2. Sample selection, variable construction, and summary statistics

In this section, we describe the sample selection process and how each variable is constructed. This is followed by summary statistics.

2.1. Sample selection

Our data on workplace injuries are obtained from the Occupational Safety Health Administration (OSHA). Under the OSHA Data Initiative Program (ODI), OSHA surveys private-sector establishments to collect data on reportable work-related injuries and acute illnesses attributable to work-related activities from 1996 to 2011.[9] OSHA surveyed about 80,000 private-sector establishments every year. All establishments under OSHA jurisdiction with 11 or more employees were required to maintain a log recording injuries and illnesses available to OSHA inspectors, unless OSHA exempted the industry due to a past history of low accident rates.[10] For each establishment, OSHA records injury and illness data, along with the establishment name, location, SIC code, number of employees, number of hours worked, and indicator variables for whether or not the establishment experiences unusual events such as strikes, facility shutdown, or natural disasters. We restrict our sample to a period of 2002 through 2011 since OSHA simplified and changed its recording criteria for injuries and illnesses and the coverage of industries that year, thus values are not comparable before versus after the changes.

We manually match each establishment from OSHA to firms in the Compustat annual file based on names. Following Cohn and Wardlaw (2016) and Caskey and Ozel (2017), we exclude financial (SIC code between 6000 and 6999) and regulated (SIC code between 4900 and 4999) firms.

[9] OSHA discontinued the ODI in 2011 because of funding cuts.
[10] The ODI program did not cover employers subject to safety regulation from other federal agencies, such as the Mine Safety and Health Administration and the Federal Aviation Administration.

Each firm in Compustat might have multiple establishments, which leaves us with a primary sample of 44,384 establishment-year observations with 16,130 unique establishments and 3,149 unique firms.

Analyst coverage data are from the Institutional Brokers' Estimate System (I/B/E/S) database. We obtain firm financial statement information from Compustat, stock return data from CRSP, institutional ownership information from Thomson Reuters Institutional Holdings (form 13F) files, union membership and collective bargaining agreement coverage from www.unionstats.com. Our final sample used in the baseline regressions consists of 31,336 establishment-year observations with 11,565 unique establishments and 1,856 unique firms, including both firms with and those without analyst coverage.

2.2. Variable construction

Following OSHA's definition, we employ workplace injuries, represented as *Total Case Rate (TCR)*, as our main variable for workplace safety. *TCR* is the sum of deaths and all injuries and illnesses that result in days away from work or with job restriction or transfer, and other recordable cases divided by the number of hours worked by all employees, then multiplied by 200,000. As a robustness check, we also use alternative measures that are provided by OSHA: (1) *Total Case*, which is the sum of deaths and all injuries and illnesses that result in days away from work or with job restriction or transfer, and other recordable cases; (2) injury rates with days away, restricted, or transferred (*DART*), which is the number of injuries and illnesses that result in days away from work or with job restriction or transfer, divided by the number of hours worked by all employees, multiplied by 200,000; (3) injury rates with days away from work (*DAFWII*), which is the number of injuries and illnesses that result in days away from work, divided by the number of hours worked by all employees, multiplied by 200,000.

To compute analyst coverage, we follow He and Tian (2013) and take the arithmetic mean of the number of monthly earnings forecasts during each calendar year for each firm extracted from the I/B/E/S summary file. We use the mean because most analysts issue at least one earnings forecast for a firm in a year, and they issue at most one earnings forecast each month. We then take the natural logarithm of one plus analyst coverage as our main independent variable, *Ln(1+Coverage)*.[11] The firm years where firms are not covered by any analysts have missing

[11] We use alternative definitions of "analyst coverage" as robustness checks. First, we follow Chang, Dasgupta, and Hilary (2006) and set analyst coverage as the maximum number (instead of the arithmetic mean) of analysts who make earnings forecasts over a 12-month period from the I/B/E/S summary file. Second, we follow He and Tian (2013) and

information in the I/B/E/S database, so we set to zero the firm-year observations with missing values.

In our baseline regressions, we follow Cohn and Wardlaw (2016) and Caskey and Ozel (2017) to control for a set of firm- and establishment-level characteristics that could affect workplace safety. The firm level control variables include *Leverage* (total short-term and long-term debt divided by total assets), *PPE/Assets* (net property, plant, and equipment divided by total assets), *Sales/Assets* (total sales divided by total assets), *CAPEX/Assets* (capital expenditure divided by total assets), *Market-to-Book* (market value of assets divided by book value of assets), *FCF/Assets* (total free cash flows divided by total assets), *Cash/Assets* (cash balances divided by total assets), and *Dividends/Assets* (cash dividends divided by total assets). We also control for establishment-level variables, including *Ln(Number of Employee), Hours Per Employee,* an indicator variable for whether there is a strike (*Strike*) or a shutdown (*Shutdown*), whether the establishment employs seasonal workers (*Seasonal*), or if the establishment is affected by adverse weather conditions or natural disasters (*Disaster*). Detailed variable definitions are provided in the Appendix A.

2.3. Summary statistics

Table 1 presents summary statistics based on the final sample of 31,336 establishment-year observations during 2002-2011. In terms of workplace safety measures, mean and median values of *TCR* are 7.75 and 6.00 percent per employee per year, respectively; the median of *Total Case* is 8 per establishment-year.[12] The median number of employees per establishment is 145, and employees work an average of 1,945 hours per year. These numbers are comparable to those reported in Cohn and Wardlaw (2016) and Caskey and Ozel (2017). As for firm-level characteristics, mean assets is $14.81 billion, which is comparable to the average assets of $12.46 billion reported in Cohn and Wardlaw (2016); mean market-to-book ratio is 1.68, which is the same as the market-to-book ratio of 1.68 in Cohn and Wardlaw (2016) and Caskey and Ozel (2017); *PPE* is on average 37% of the total assets; average capital expenditure is about 5.5% of total assets; an average firm pays 1.4% of total assets as dividends to shareholders. Overall, these firm-level variables are also consistent with those documented in Cohn and Wardlaw (2016) and Caskey and Ozel (2017).

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use the historical I/B/E/S detail file to calculate the total number of unique analysts issuing earnings forecast during the 12-month period during a fiscal year. Our results remain robust.

[12] Our mean/median value of *TCR* and *Total Case* is comparable to those reported in Caskey and Ozel (2017).

Insert Table 1

3. Empirical results

3.1. Baseline OLS regressions

We first examine the relationship between analyst coverage and workplace safety in an Ordinary Least Square (OLS) regression framework. All right-hand-side variables are lagged by one year. We estimate various regression models including different types of fixed effects. The results are reported in Table 2. For all specifications, the dependent variable is total case rate (*TCR*), which is the number of deaths and all injuries and illnesses per work hour (multiplied by 200,000). The primary variable of interest is *Ln(1+Coverage)*. We start with a model without fixed effects in column (1). The coefficient estimate on *Ln(1+Coverage)* is negative and statistically significance at the 1% level. This preliminary evidence supports the *monitoring hypothesis*.

In column (2), we include both industry and year fixed effects. The result holds − *Ln(1+Coverage)* is significantly negatively related to TCR. We include both industry- and establishment-fixed effects in column (3) and the coefficient estimate on *Ln(1+Coverage)* remains negative and highly significant. In columns (4)-(7), we control for various combinations of fixed effects, including industry- and firm-fixed effects, industry and year-state fixed effects, establishment and year-industry fixed effects, establishment and year-state fixed effects. Again, the coefficient estimate on *Ln(1+Coverage)* is negative and statistically significant. Economically, depending on the specification, the magnitude of the coefficient estimates on *Ln(1+Coverage)* varies from -0.191 to -0.805. To put this in perspective, take column (1). When analyst coverage increases from the 25th percentile to the 75th percentile, *TCR* drops by 1.27, which corresponds to a 16.38% reduction of *TCR* from the mean level (1.27/7.75=16.38%).

In columns (8)-(9), we examine whether the presence of analyst coverage rather than the extent of coverage is related to workplace safety. We define an indicator variable, *WithAnalyst*, which equals one if a firm is covered by at least one analyst as recorded in I/B/E/S, and zero otherwise. Firms with analyst coverage are associated with a significantly lower *TCR* compared to those that are not covered by any analyst.

Insert Table 2 here

The results in Table 2 are also in line with the literature on how firm and establishment characteristics affect workplace safety. For example, consistent with Cohn and Wardlaw (2016), after controlling for year- and establishment-level fixed effects in column (6), injury rates display a negative relationship with *Dividends/Assets*, and no relation between *Cash/Assets*, *CAPEX/Assets*, *Sales/Assets*. However, we find that injury rates are insignificantly related to *Ln(Assets)* and *Leverage*, and positively related to *FCF/Assets*, which are inconsistent with the evidence in Cohn and Wardlaw (2016). The establishment characteristics are largely consistent with Caskey and Ozel (2017). For instance, injury rates are negatively related to the number of hours worked per employee (*Hours Per Employee*), positively related to *Season*, and not related to establishment size (*Ln(Number of Employee)*), *Disaster* and *Strike*.

Overall, the baseline OLS regression results indicate that a firm's analyst coverage is negatively related to its establishments' injury rates. This evidence is consistent with the *monitoring hypothesis* − greater analyst coverage is associated with better external monitoring thereby improving workplace safety.[13]

3.2. Robustness checks

We conduct a battery of robustness checks to ensure our main results are valid. Further, we provide several incremental tests that should help alleviate endogeneity concerns.

3.2.1 Control for earnings forecast pressure

As we argue above, analysts could play a monitoring role as well as exert short-term pressure on management through earnings forecasts. Caskey and Ozel (2017) report higher injury/illness rates in firms that meet or just beat analyst forecasts compared to firms that miss or beat forecasts by a larger margin. To tease out the pressure effect from the potential monitoring role played by analysts, we control for earnings forecast pressure in the OLS regressions. Following Caskey and Ozel (2017), we construct an indicator variable (*Meet/Beat*) that equals one if a firm meets or beats analysts' consensus earnings forecasts by two cents or less, and zero otherwise. The consensus earnings forecast is computed based on each analyst's latest forecast issued between 180 to 4 days before earnings announcements. The regression results are reported in Appendix B. We find that the coefficient estimates on the *Meet/Beat* dummy are positive and significant in all eight models,

[13] Note that our tests are conducted at the establishment-level. Therefore, firms with multiple establishments enter our sample *N* times. We also aggregate establishment-level injury rates at the firm-level and rerun the regressions using firm-level data. These tests are reported in Appendix B. The results are robust.

consistent with the findings in Caskey and Ozel (2017). Even after controlling for earnings forecast pressure, analyst coverage remains significantly positively related to the injury rate. The results are robust across all eight models. Therefore, the analyst coverage effect on worker safety we document is above and beyond potential short-term pressure they might impose on management via earnings benchmarking.

3.2.2 Firm-level analysis

Our tests above are conducted at the establishment-level. Therefore, firms with multiple establishments enter our sample *N* times. We alternatively aggregate establishment-level injury rates at the firm-level and rerun the regressions using firm-year observations. These tests are reported in Appendix C. The dependent variable *TCR (Firm)* is the sum of deaths and all injuries and illnesses from all establishments in a firm divided by sum of employees of all establishments. *Total Case (Firm)* is the sum of deaths and all injuries and illnesses from all establishments in a firm. As shown in the Appendix C, our results remain robust. There is a consistently significant negative relationship between analyst coverage and workplace injury rates.

3.2.3 Alternative measures of injury rate

First, as argued by both Cohn and Wardlaw (2016) and Caskey and Ozel (2017), workplace safety can be measured not only by injury rates, but also by the total number of injury cases. Following these papers, we rerun our baseline models using Poisson and Negative Binomial regressions where the dependent variable is *Total Case*, the sum of injuries and illnesses that result in days away from work or transfer and other recordable cases. For brevity, we suppress all control variables. The results are reported in columns (1)-(2) (Poisson Regressions) and columns (3)-(4) (Negative Binomial Regressions) of Table 3. Similar to our baseline analysis in Table 2, all of the coefficient estimates on *Ln(1+Coverge)* are negative and statistically significant.

Insert Table 3

Next, OSHA defines workplace injury rates in two alternative ways. *DART* is the number of injuries and illnesses with days away from work and with job restriction or transfer divided by the number of hours worked by all employees in a given establishment-year, multiplied by 200,000. *DAFWII* is the number of injuries and illnesses with days away from work divided by the number of hours worked by all employees in a given establishment-year, multiplied by 200,000. We rerun OLS regressions based on these alternative injury measurements. The results are shown in Table 3, columns (5)-(6) (for *DART)* and (7)-(8) (for *DAFWII*). In brief, our main result remains unchanged based on *DART* and *DAFWII*. Our main results are robust to different model specifications and various OSHA definitions of workplace injury rate.

3.2.4 Quasi-natural experiments

Though our baseline OLS results in Tables 2 and 3 are consistent with the *monitoring hypothesis*, a concern arises since analyst coverage is likely to be endogenous. To address this concern and move us closer to causal inference, we rely on two distinct approaches. First, we employ quasi-natural experiments using brokerage closures introduced by Kelly and Ljungqvist (2012). Analysts dropped coverage on firms when their broker shuts its doors, which was not driven by characteristics of the firms they covered. Therefore, brokerage closures create a shock to firm-level analyst coverage that is exogenous to firms' performance and investments including workplace safety. This provides an ideal setting for a "natural experiment" under which any change in workplace injuries could be attributed to the reduction in analyst coverage. The second experiment is similar in that it instead relies on brokerage mergers. In this case, when one stock has duplicate coverage by both brokers (the acquirer and target) before the merger, one of their analysts likely will drop coverage after the merger because of redundancy. Hence, brokerage mergers generate another shock to analyst coverage that is likely exogenous to workplace safety.

We obtain a list of unique events of brokerage house closures and mergers from Hong and Kacperczyk (2010) and Kelly and Ljungqvist (2012). We find a total of 8 closures and 8 mergers (16 unique events) during our sample period. In our empirical setup, we make use of a difference-in-differences analysis where treated observations (those firms that lose analyst coverage by a closure or merger) are compared against control firms (that are selected based on similar firm and establishment characteristics). We drop firms that are covered by one or both brokerage houses before a merger but are no longer covered by the surviving brokerage house after a merger to avoid a situation where a surviving brokerage house decides to stop covering the firm. We further require treated establishments to have non-missing values in both matching variables and workplace safety data during a seven-year window (from year -3 to year +3) spanning the actual event year.[14]

[14] As pointed out by He and Tian (2013), brokerage closures and mergers usually span a long period of time rather than a specific date. Therefore, following their lead, we define the event starting and ending date as 3 months before and 3

For each treated establishment, we identify control establishments by first selecting candidate control establishments in the same tercile of various characteristics, e.g., market value of equity (*MV*), book-to-market (*BM*), average monthly stock returns (*RET*), number of analyst coverage (*NOAN*), annualized daily stock return volatility (*VOL*), average monthly stock turnover (*TURN*), hours per employee (*HOUR*), and in the same Fama-French 10 industry (FF10), in the year prior to the event (year -1). Then, among them, we select five establishments that have the closest number of analyst coverage to the treated establishment as controls.[15]

Insert Table 4 here

The results from the DiD estimation are reported in Table 4 Panel A. We define *Treat* as one for treated establishments and zero for control establishments. We include a seven-year window (from year -3 to year +3) spanning the actual event year. *Post* equals one for post-event years, zero otherwise. The DiD regression is estimated where the dependent variable is injury rate (*TCR, DART, DAFWII*) and the independent variables are *Treat*, *Post*, and the interaction term of *Treat*Post*.

For brevity, we only report the DiD estimate that is captured by the coefficient estimate on the interaction term of *Treat*Post*. In the first row, we identify control establishments based on market value of equity (*MV*), book-to-market (*BM*), average monthly stock returns (*RET*), number of analyst coverage (*NOAN*), and require both treated and control establishments to be in the same industry Fama-French 10 industry. The DiD estimate for all three measures of injury rates are positive and statistically significant at the 1% level. Economically, given the DiD estimate of 2.743 for *TCR*, this implies workplace injury rates in treated establishments are 33.2% higher than control establishments.[16] This result is consistent with the baseline OLS results supporting the *monitoring hypothesis*. When coverage is exogenously reduced, worker injury rates rise.

In the remaining specifications we apply different selection criteria for establishing control firms. For instance, longer working hours might jeopardize workplace safety, and thus in row (2) we include an additional matching variable, hours per employee (*Hours Per Employee*) to identify control establishments. The DiD estimate remains positive and significant. We further expand the list of

months after the event date, respectively. We then define "one year" before and after the event as 15 months before the event date (i.e., 12 months before the event starting date) and 15 months after the event date (i.e., 12 months after the event ending date), respectively.

[15] We obtain similar results when we select one establishment that has the closest number of analyst coverage to the treated establishment as the control establishment.

[16] Control establishments have a mean *TCR* of 8.27, thus a difference of 2.743 in *TCR* is equivalent to 33.2%.

matching variables by including annualized daily stock return volatility (*VOL*) and average monthly stock turnover (*TURN*). The results are presented in rows (3)-(10) and remain robust. The magnitude of the DiD estimate varies from 1.769 to 3.664 for *TCR*, which is economically significant (ranging from an increase of 21.4% and 44.3% *TCR* based on the sample mean).

To ensure that the treated and control groups are comparable in firm and establishment characteristics, we run univariate T-tests to compare the two groups, for example in row (4), and the results are reported in Table 4 Panel B. There is no statistically significant difference in any of the firm- and establishment-level characteristics between the two groups, suggesting that the matching approach is appropriate.

3.2.5 Instrumental variable approach

As a further robustness test, we employ an instrumental variables approach following Yu (2008), He and Tian (2013), and Guo et al. (2018). We use "expected coverage" as an instrument, which captures the change in analyst coverage driven by changes in brokerage house size. Yu (2008) argues that the size of a brokerage house in general depends on its revenues or profits, not on the characteristics of the firms being covered. As a result, changes in analyst coverage attributed to changes of brokerage house size are likely exogenous variations to covered firms' corporate policy (e.g., worker safety investment).

Following Yu (2008), we compute expected coverage using the two equations below:

$$ExpCoverage_{(i,\,t,\,j)} = \left(BrokerSize_{(t,\,j)} \big/ BrokerSize_{(0,\,j)}\right) \times Coverage_{(i,\,0,\,j)}, \quad (1)$$

$$ExpCoverage_{(i,\,t)} = \sum_{j=1}^{n} ExpCoverage_{(i,\,t,\,j)}, \quad (2)$$

where $ExpCoverage_{(i,\,t,\,j)}$ is the expected coverage of firm *i* in year *t* from brokerage house *j*. $BrokerSize_{(t,\,j)}$ and $BrokerSize_{(0,\,j)}$ are the number of analysts working for broker *j* in year *t* and in year *0*, respectively. Since our sample period is 2002-2011 with the right-hand-side variables lagged by one year (starting in 2001), we use year 2000 as the benchmark year (i.e., year *0*). $Coverage_{(i,\,0,\,j)}$ is the number of analysts that follow firm *i* and work for broker *j* in year *0*. The instrumental variable is $ExpCoverage_{(i,\,t)}$, which is the sum of $ExpCoverage_{(i,\,t,\,j)}$ − the expected number of analysts following firm *i* from all brokerage houses (j=1, 2, ….n) in year *t*. $ExpCoverage_{(i,\,t)}$ is expected to correlated with observed analyst coverage, i.e., the endogenous variable $Ln(1+Coverage)_{(i,t)}$ but not related to firm *i*'s safety policy. Appendix D reports the results of two stage least squares (2SLS) instrumental variable (IV) regressions. We include the same control variables as those in the baseline OLS regression (see

Table 2), however suppress the coefficient estimates for brevity. Following the order of columns (1) through (7) in Table 2, we also include various fixed effects in the IV−2SLS regressions.

The first-stage regression results are presented in Appendix Table D Panel A, where the dependent variable is *Ln(1+Coverage)*. The coefficient estimate of the instrument *ExpCoverage* is positive and significant at the 1% level in all seven columns, consistent with the findings in Yu (2008) and He and Tian (2013). The significant correlation between *ExpCoverage* and *Ln(1+Coverage)* suggests that the instrument satisfies the relevance criteria.

In Panel B of Appendix Table D we report the results from the second-stage regressions where the dependent variable is *TCR* and the independent variable is the fitted value of *Ln(1+Coverage)* from the first-stage regression. As with Panel A, we only report the coefficient estimates of the instrumented *Ln(1+Coverage)* and suppress those of all other controls to save space. As with the findings from the OLS analysis in Table 2, the coefficient estimates of instrumented *Ln(1+Coverage)* are negative and highly significant in all seven columns. Thus, our results are robust using the IV approach, which should also mitigate any endogeneity issues.[17]

Collectively, the results in this section provide robust evidence in line with the *monitoring hypothesis*. The evidence lends strong support to the notion that increased analyst coverage leads to improvement in workplace safety.

4. Cross-sectional implications

Having established a positive relation of analyst coverage on workplace safety, we next investigate how analyst monitoring interacts with firm and analyst characteristics. Specifically, we consider the cross-sectional implications of union power, analyst reputation, and analyst location.

Insert Table 5 here

4.1 Union bargaining power

The creation and main purpose of labor unions is to unify workers and provide a voice for better pay and working conditions. For instance, consider the website of the American Federation of Labor (AFL), one of the nation's most powerful labor unions. On their main home page, in one sentence, they succinctly describe what they care about. "All working people deserve good jobs and

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[17] In untabulated tables, we use 2001 or 2002 as the benchmark year and obtain similar results. Furthermore, as we restrict the sample to firms that were followed by at least one analyst in the benchmark year, our results remain robust.

the power to determine their wages and working conditions." Thus, unions should provide a monitoring role over management in ensuring safe working conditions. The incremental impact of analysts is unclear. On one hand, analysts may add more value in industries with low union bargaining power because they lack a unifying voice to bargain. On the other hand, analysts may complement union goals, particularly those that have strong bargaining power.

We define *Low Union Membership* as an indicator variable that equals one if an establishment is from an industry with union membership below the sample median in a year, and zero otherwise. We also define *Low Bargain Agreement* as an indicator variable that equals one if an establishment is from an industry with collective bargaining agreement coverage below the sample median in a year, and zero otherwise. We include an interaction term of low union power and analyst coverage to assess the differential effect of analyst monitoring in firms with low vs. high union power. The results are reported in columns (1) and (2) of Table 5 Panel A. Both interaction terms are negative and significant implying that analysts play a greater monitoring role in the presence of low union power, implying that analyst monitoring may act as a substitute for unions.

4.2. All-star analysts

Prior literature finds that different types of analysts have different information production skills and different incentives to monitor managers. All-star analysts are more likely to have superior access to management, which offers advantages in information gathering (Bradshaw, 2011; Soltes, 2014). Fang and Yasuda (2009) argue that personal reputation is an effective disciplinary device against conflicts of interest, hence, all-star analysts are presumed to be better monitors because of their higher reputation.

As such, we next examine the incremental impact of the monitoring abilities by all-star analysts beyond analyst coverage itself. Following Clarke et al. (2007) and Bradley et al. (2017), we define all-star analysts as those who are listed in the All-American Research Team in the current year October issue of *Institutional Investor* magazine.[18] We consider two variables. We compute the % of all-star analysts to total analyst coverage (*% of Star Analyst Coverage*) and a simple binary indicator to identify firms that have at least one all-star analyst covering them (*WithStarAnalyst*). The results are reported in Table 5 Panel B.[19]

[18] We would like to thank Jonathan Clarke for kindly sharing his data on all-star analysts.
[19] About 50% of firms have all-star analyst coverage.

In column (1), after controlling for coverage by all analysts − *Ln(1+Coverage),* the coefficient estimate on *% of Star Analyst Coverage* is negative and statistically significant, suggesting that workplace safety is positively related to the percentage of all-star analysts covering the firm.[20] Likewise, in column (2), we also observe a negative and statistically significant coefficient estimate on *WithStarCoverage*. Note that the impact of all-stars is incremental to a firm's overall analyst coverage. We interpret these results as being consistent with a stronger monitoring effect from all-star analysts resulting from their greater reputation capital.

4.3. Local vs. distant analysts

Prior research has documented an information advantage by local analysts because information acquisitions costs are lower. They are likely to more often conduct site visits and they likely have better access to management via personal connections or they may be more likely to talk to local employees, customers or competitors of the firm to collect first-hand information (e.g., Malloy, 2005; O'Brien and Tan, 2014; Cheng, Du, Wang ,Wang, 2016). As a result, we expect local analysts to play a more important role in monitoring worker safety in a particular establishment than distant analysts. To examine this conjecture, we follow O'Brien and Tan (2015) and compute geographic distance between analyst locations that were obtained from Nelson's directory of Investment Research and establishment locations from the OSHA database.[21] We obtain latitudes and longitudes for cities from the 1990 and 2000 Census Gazetteer Files available from the U.S. Census Bureau Website. We employ a Great Circle Distance algorithm based on the latitudes and longitudes of the cities to compute the distances between analysts and establishments. We define local analysts as those who are within 100km of the covered establishment. The rest are distant analysts. We include the natural logarithm of one plus the number of local analysts (*Ln(1+Number of Local Analysts)*) and the natural logarithm of one plus the number of distant analysts (*Ln(1+Number of Distant Analysts)*) as independent variables. The results are reported in Table 5 Panel C.

As shown in columns (1) and (2), the coefficient estimates on *Ln(1+Number of Local Analysts)* and *Ln(1+Number of Distant Analysts)* are both negative and statistically significant, suggesting that coverage by local and distant analysts both improves workplace safety. In column (3), we include both the number of local analysts and the number of distant analysts in the same regression. The

[20] There are fewer observations in column (1) than those in column (2) due to missing values in *% of Star Analyst Coverage* when total analyst coverage is zero.
[21] We would like to thank Sinan Gokkaya and Xi Liu for kindly sharing their data on analyst location.

coefficient estimates on both variables remain negative and significant. An F-test that compares the two coefficient estimates on *Ln(1+Number of Local Analysts)* and *Ln(1+Number of Distant Analysts)* shows that the effect of local analysts on worker safety is significantly larger than that of distant analysts. The finding indicates a stronger monitoring effect by local analysts, which we argue is likely due to their closer proximity and improved ability to monitor.

5. Plausible mechanisms

Our results to this point provide robust evidence that workplace injuries decline as more analysts cover the firm. Our explanation for this result is that analysts are superior monitors of the firm and can discipline management to adopt policies that are in the best interests of shareholders. Higher analyst presence in industries with low union bargaining power has a larger impact where managers likely have more latitude to adjust safety policies. Further, we find that more reputable (all-star analysts) and local (local analysts) monitors have a larger impact, consistent with the view that they are more likely to uncover and challenge management when unacceptable policies are identified. However, the mechanism through which this takes place is unclear. In this section, we provide some preliminary evidence on some plausible mechanisms. For instance, the mere presence of more analysts may provide enough of a deterrent to discipline management to act. Let's assume management is knowingly operating an unsafe factory. More analysts presumably equate to more analyst site visits and overall scrutiny. Thus, the threat of detection increases as analyst coverage increases perhaps forcing management to react proactively. Of course, this mechanism is not observable, but we examine several plausible channels below.

5.1. Management compensation contracts

Firm executives play a critical role in corporate workplace safety practices. Caskey and Ozel (2017) find that managers either increase workloads or cut safety-related expenditures directly when they face short-term pressure to meet earnings expectations. A fundamental premise in corporate finance is that compensation contracts are effective in mitigating conflicts of interest between managers and shareholders (John and John, 1993; Cebon and Hermalin, 2015). Consequently, one approach to align the interests of managers with those of other stakeholders is through executive compensation contracts. If managers are provided an incentive to maintain or improve workplace safety in their compensation package, it increases the likelihood their attention is more focused on promoting a safe work environment. As such, we propose that analysts might stress the importance of workplace safety and indirectly guide the board to appropriately incentivize managers taking actions to improve workplace safety.

To investigate this proposition, we employ the Incentive Labs database, which summarizes details of compensation contracts as disclosed in proxy statements including various performance metrics in performance vesting grants of equity and options.[22] We flag compensation contracts that include performance metrics related to workplace safety by searching keywords "safe", "safety", "injure", and "injury".[23] For the observations with a hit of at least one of the keywords, we read the description of the metrics to ensure the compensation contracts are indeed linked to workplace safety. We start with a sample consisting of non-financial and non-utility firms covered by both the Occupational Safety and Health Administration (OSHA) and the Incentive Lab Database during 2002-2011. We define an indicator variable *Safety Incentive* that equals one if a firm includes performance metrics related to workplace safety in the executive compensation contracts, and zero otherwise. Among a total of 1,887 firm-year observations, 101 (5.4%) firm-year observations and 41 unique firms contain safety incentives in their executive compensation contracts.[24]

We next estimate logit regressions to investigate whether analyst coverage is associated with the likelihood of adopting a safety incentive in the compensation contract. The dependent variable is a binary variable, *Safety Incentive*, and the main independent variable of interest is *Ln(1+Coverage)*. Following Bettis et al. (2010) we include many firm characteristics as control variables, e.g., *Business Segments*, *Industry-Adjusted Stock Return*, *Inst.Ownership*, *Volatility*, *Investment/Assets*, *Market Value of Equity*, *Board Size*, and *% of IndBoard*. Detailed definitions of these variables are provided in the Appendix Table A.

Insert Table 6 here

Table 6 reports the results of the logit regressions. In column (1) we do not control for fixed effects. The coefficient estimate on *Ln(1+Coverage)* is positive and statistically significant at the 5% level. In column (2), after we control for both year and industry fixed effects, *Ln(1+Coverage)* remains positively related to the likelihood of adopting a safety incentive in the compensation package and

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[22] Incentive Lab collects detailed information on all short-term and long-term equity-based awards and cash awards from proxy statements for the largest 750 firms, measured by stock market capitalization every year starting in 1998.

[23] It yields the same results as we search for the 27 keywords related to safety that are later used for textual analysis of earnings conference call transcripts.

[24] Our sample becomes much small after merging with the Incentive Labs database since the latter covers the largest 750 firms starting in 1998.

the result is significant at the 10% level. Economically, this implies the likelihood of adopting safety incentive increases by 68.8% as analyst coverage rises from the 25th percentile to the 75th percentile of the distribution. Since managers are incentivized through their compensation contracts, they possibly pay more attention to safety and take action to reduce worker injuries. This could be one plausible mechanism of increased analyst monitoring.

To address endogeneity, we use instrumented *Ln(1+Coverage)* as the independent variable in columns (3)–(4) of Table 6, where instrumented *Ln(1+Coverage)* is the fitted value of *Ln(1+Coverage)* from the first-stage regression (see Panel A of Appendix Table D) using *ExpCoverage* as an instrument. We find that instrumented *Ln(1+Coverage)* remains positive and significantly related to the likelihood of employing a safety incentive in executive compensation contracts.

5.2. Worker safety culture

Besides C-suite executives, middle-level managers such as plant-level managers as well as the overall corporate culture regarding workplace safety may influence the realized injury rate. We next examine the effect of analyst coverage on the overall firm level workplace safety environment.

Insert Table 7 here

We measure a firm's overall safety environment using the KLD database provided by MSCI ESG Research, which features the largest corporate social research staff in the world.[25] From 1991 to 2000 the database covers approximately 650 firms sourced from the S&P 500® Index and the Domini 400 Social Index. In 2001, the 1000 Largest U.S. Companies and then in 2002 the Large Cap Social Index were added. Finally, KLD expanded coverage to include 2000 Small Cap U.S. Companies and the Broad Market Social Index in 2003. There are seven qualitative areas addressed by KLD: community, corporate governance, diversity, employee relations, environment, human rights, and product. Each section has sub-categories that can be rated positively as a strength or negatively as a concern. We focus on two variables: "Health and Safety Strength" and "Health and Safety Concerns." KLD assigns 0/1 rating for both variables. We construct a composite index, *Safety Index*, by taking the workplace safety strength rating and subtracting the workplace safety weakness rating. While the KLD *Safety Index* is correlated with injury rates, it also reflects the ongoing safety policy and corporate safety culture from the perspectives of employees and managers.

[25] http://www.msci.com/resources/factsheets/MSCI_ESG_Research.pdf

To assess how analyst coverage is associated with firm-level *Safety Index*, we estimate OLS regressions. The results are reported in column (1) of Table 7. The dependent variable is *Safety Index* and the main independent variable is *Ln(1+Coverage)*. Following Di Giuli and Kostovetsky (2014), we include *Blue State Dummy*, *Ln(Assets)*, *KZIndex*, *ROA*, *Cash Assets*, *Market-to-Book*, and *Dividends/Assets* as control variables. Prior studies have shown that these firm-characteristics are related to KLD ratings.

Results from the OLS model in column (1) suggest that the *Safety Index* is positively related to analyst coverage at the 5% significance level. Since the dependent variable *Safety Index* is a count variable, we estimate an ordered logit model as shown in column (2). Analyst coverage remains significantly related to firms' overall workplace safety environment captured by *Safety Index*. The results suggest that analyst coverage is associated with an overall improvement in firms' workplace safety culture and environment, which presumably is related to lower worker injury records. Again, we employ the instrumented *Ln(1+Coverage)* in columns (3)−(4) to mitigate the endogeneity concerns. The results remain robust.

5.3. Worker Safety Expenditures

Firms' investments in reducing the risk of job-related injuries involve direct expenses for purchasing and maintenance of physical assets, e.g., maintaining equipment, replacing old parts and machines, acquiring equipment with better safety features, etc. Investments in safety also involve considerable expenditures on less tangible activities that affect safety, e.g., setting up and enforcing safety policies and procedures, employee safety training and supervision, etc. Many plants launch safety committees to develop safety improvements. For instance, many firms hire safety consultants to improve safety practices.[26] We assess how analyst coverage affects firms' investments in workplace safety. Since safety investments are lumped with SG&A rather than reported as an individual item in firms' financial statements, we follow Caskey and Ozel (2017) and estimate the safety related expenditures from abnormal discretionary expenses. In particular we run the following model based on Roychowdhury (2006) for each two-digit SIC coded industry in year t:

$$SG\&A_{(i,\,t)}/Emp_{(i,\,t-1)} = \beta_0 + \beta_1 * (1/Emp_{(i,\,t-1)}) + \beta_2 * (1/Emp_{(i,\,t-1)}) + e_{(i,t)} \quad (3)$$

[26] See the DuPont case study on Norfolk Southern: http://www2.dupont.com/Sustainable_Solutions/en_US/assets/downloads/case_studies/NorfolkSouthern_CaseStudy.pdf.

where SG&A is a firm's selling, general and administrative expenses, Emp is the total number of employees in a firm, and Sales is the total sales of a firm. We require a minimum of 15 observations within each two-digit SIC code every year to estimate the regression, and *Safety Expenditures* is obtained as the residual from Equation (3). Then we examine the effect of analyst coverage on *Safety Expenditures*. The results are reported in Table 8.

Insert Table 8 here

In column (1), we observe a positive and statistically significant coefficient estimate on analyst coverage, suggesting that greater analyst coverage leads to a higher level of abnormal discretionary expenses in safety. We find the same result after controlling for fixed effects as shown in column (2). Again, to mitigate the endogeneity concerns, we employ the instrumental variable approach and find that instrumented analyst coverage is robust (see columns (3) and (4)).

Up to this point, we've examined some plausible mechanism through which analysts may impact worker safety. Our evidence suggests that more analyst coverage is related to firms adopting safety clauses in their executive compensation schemes, maintaining a corporate culture more conducive to safety, and increased safety investments. We now turn to safety discussions in conference calls.

5.4. Discussion of safety during earnings conference calls

Earnings conference calls is an effective channel by which analysts interact with managers to collect information and potentially exert their monitoring efforts (e.g., Matsumoto et al., 2011; Mayew and Venkatachalam, 2012; Chapman and Green, 2018). If analysts care about workplace safety for performance or valuation purposes, they might raise questions about safety during the Q&A session during conference calls. On the other hand, management may anticipate analysts' questions and concerns about the workplace and voluntarily discuss safety issues during conference calls. In this section, we intend to explore the extent to which worker safety issues are discussed in conference calls, and whether analyst coverage is related to the likelihood of such a discussion.

For this purpose, we download all the quarterly earnings conference call transcripts during 2002 to 2011 from *Thomson Reuters StreetEvents*. We search for 27 keywords related to safety.[27] Then,

[27] The keywords are OSHA, Occupational Safety and Health Administration, Injury Rate, Safety Record, Injuries, Death, Occupational Safety, Worker Safety, Safety Training, Safety Performance, Safety Climate, Safety Program, Work

for each hit, we manually read through each transcript and exclude those that are irrelevant (e.g., product safety, customer injury, death of executive, etc). Among 24,971 transcripts during 2002 to 2011 that we examined, we identify 2,273 cases where management or analysts discussed workplace safety issues/events, either in management presentations or during the Q&A session.

To formally examine how analyst coverage affects the extent of safety-related discussion, we merge the aforementioned conference call cases with our sample. We define a binary variable: *Safety Discussion*, which equals one if a firm's management discussed workplace safety related issues in conference calls or any analyst raises a question related to workplace safety at Q&A session, and zero otherwise. We follow the literature (e.g., Bamber, Jiang, and Wang, 2010) to construct control variables (*Ln(Sales)*, *Leverage*, *Market-to-Book*, *Volatility*, *Market Value of Equity*, *ROA*, *Litigation Industry*, *R&D/Assets*). Our sample consists of 5,825 firm-year observations where we have non-missing values for control variables. We estimate logit models to examine whether analyst coverage has any influence on the likelihood of discussing safety issues in conferences calls. The results are reported in Table 9.

Insert Table 9 here

Columns (1) and (2) show that *Ln(1+Coverage)* is positively and significantly related to the likelihood of safety discussion in conference calls, regardless whether we control for year and industry fixed effects. The coefficient estimate in column (2) implies that the likelihood of safety-discussion by the management increases by approximately 40% as analyst coverage rises from the 25^{th} percentile to the 75^{th} percentile of the distribution, implying an economically significant impact. In columns (3)−(4), the instrumented *Ln(1+Coverage)* is used to mitigate the endogeneity concerns. The results are qualitatively similar. This evidence also lends support to the *monitoring hypothesis*. We find that with greater analyst coverage, managers are more likely to disclose information related to workplace safety during conference calls.

6. Conclusions

In this study, we investigate the effect of analyst coverage on firms' workplace safety. This is an important topic given the social welfare and economic consequences of workplace injuries. We

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Environment Safety, Fatalities, TRIR, Total Recordable Incident Rate, Incident Rate, Injury, Injure, Workplace Safety, Illness, Employee Safety, Safety Procedure, Safety Hazard, Work Safety, Safety Condition, Fatality.

proposed two competing hypotheses with opposite empirical predictions to explain why analyst coverage may impact worker safety. The *monitoring hypothesis* suggests analysts can discipline management from engaging in self-serving behavior whereas the *pressure hypothesis* advocates that analysts pressure firms to meet earnings forecasts and make short-sighted decisions, predicting a negative and positive effect on worker injury rates, respectively. Consistent with the *monitoring hypothesis*, we document a significant negative relationship between analyst coverage and workplace injury rates. We perform a battery of robustness tests and show our results hold under various model specifications, definitions of workplace injury rate, and endogeneity concerns. In the cross-section, we find that the effect of analyst coverage on workplace safety is stronger in industries where unions have a weak bargaining power, firms with more all-star analyst coverage, and in the presence of local analysts. These results highlight the important monitoring role that analysts play in this setting.

Finally, we show that that greater analyst coverage is related to the use of workplace safety metrics in executive compensation contracts, corporate culture that encourages investments in worker safety, and management and analyst discussion safety issues in earnings conference calls. Other mechanisms through which analysts impact worker safety are likely to exist. While we leave these for future research, to our knowledge our paper provides the first evidence that analyst coverage has positive yet likely unintended consequences on worker welfare.

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Table 1

Summary Statistics.

This table presents summary statistics of our sample. The sample consists of establishments from Occupational Safety and Health Administration (OSHA) during 2002-2011 that belong to non-financial and non-utility firms. Workplace safety related variables are defined as following: *TCR* is the sum of deaths and all injuries and illnesses that result in days away from work or with job restriction or transfer, and other recordable cases divided by the number of hours worked by all employees in a given establishment-year, then multiplied by 200,000. *DART* is the number of injuries and illnesses that result in days away from work or with job restriction or transfer, divided by the number of hours worked by all employees in a given establishment-year, then multiplied by 200,000. *DAFWII* is the number of injuries and illnesses that result in days away from work, divided by the number of hours worked by all employees in a given establishment-year, then multiplied by 200,000. *Total Case* is the sum of deaths and all injuries and illnesses that result in days away from work or with job restriction or transfer, and other recordable cases. Variables that are on firm level are defined as following: *Coverage* is the arithmetic mean of the numbers of monthly earnings forecasts during each calendar year for each firm extracted from the I/B/E/S summary file; *Assets* is total assets (in $billions) at a fiscal year end; *Sales* is total sales (in $billions) in a fiscal year; *Leverage* is total short-term and long-term debt divided by total assets at a fiscal year end; *Market-to-Book* is market value of assets divided by book value of assets at a fiscal year end; *PPE/Assets* is net property, plant, and equipment divided by total assets; *Sales/Assets* is total sales divided by total assets; *CAPEX/Assets* is capital expenditure divided by total assets; *FCF/Assets* is total free cash flows divided by total assets; *Cash/Assets* is cash and short-term investments divided by total assets; *Dividends/Assets* is total cash dividends paid to common shares divided by total assets. Variables that are on establishment-level are defined as following: *Number of Employee* (in 000s) is total number of employees working in a given establishment during the year; *Hours Per Employee* (in 000s) is total number of annual hours worked in a given establishment divided by the number of employees; *Strike* is an indicator variable that equals one if there was a strike in the establishment during the year, and zero otherwise; *Shutdown* is an indicator variable that equals one if there was a shutdown in the establishment during the year, and zero otherwise; *Seasonal* is an indicator variable that equals one if the establishment employs seasonal workers, and zero otherwise; *Disaster* is an indicator variable that equals one if the establishment is affected by adverse weather conditions or natural disasters during the year, and zero otherwise.

Variable	N	Mean	P25	Median	P75	Standard Deviation
TCR	31,336	7.745	2.087	6.000	11.410	7.108
Total Case	31,336	20.550	3.000	8.000	20.000	42.220
DART	31,336	4.993	0.809	3.484	7.519	5.256
DAFWII	31,336	2.187	0.000	1.064	2.970	3.065
Coverage	31,336	11.300	3.083	10.580	18.750	8.703
Assets (in $billions)	31,336	14.810	1.018	7.483	28.910	15.711
Sales (in $billions)	31,336	20.230	1.301	7.557	36.580	22.980
PPE/Assets	31,336	0.371	0.195	0.345	0.557	0.200
Sales/Assets	31,336	1.417	0.896	1.273	1.755	0.719
CAPEX/Assets	31,336	0.055	0.026	0.045	0.075	0.038
FCF/Assets	31,336	0.060	0.025	0.059	0.107	0.081
Cash/Assets	31,336	0.091	0.027	0.051	0.120	0.107
Dividends/Assets	31,336	0.014	0.000	0.009	0.021	0.017
Leverage	31,336	0.267	0.146	0.252	0.353	0.177
Market-to-Book	31,336	1.682	1.087	1.480	2.177	0.752
Number of Employee (in 000s)	31,336	0.299	0.077	0.145	0.296	0.481
Hours Per Employee (in 000s)	31,336	1.902	1.681	1.950	2.085	0.322
Strike	31,336	0.002	0.000	0.000	0.000	0.039
Shutdown	31,336	0.093	0.000	0.000	0.000	0.291
Seasonal	31,336	0.039	0.000	0.000	0.000	0.192
Disaster	31,336	0.006	0.000	0.000	0.000	0.079

Table 2

Analyst Coverage and Workplace Safety: Baseline Models.

This table presents the results of OLS regressions that estimate the relationship between analyst coverage and workplace safety. The sample consists of establishments from Occupational Safety and Health Administration (OSHA) during 2002-2011 that belong to non-financial and non-utility firms. For all specifications, the dependent variable is total case rate (*TCR*), which is the sum of deaths and all injuries and illnesses that result in days away from work or with job restriction or transfer, and other recordable cases divided by the number of hours worked by all employees in a given establishment-year, then multiplied by 200,000. In columns (1)-(7), the independent variable is the natural logarithm of one plus analyst coverage, where *Coverage* is the arithmetic mean of the numbers of monthly earnings forecasts during each calendar year for each firm extracted from the I/B/E/S summary file. In columns (8) and (9), the independent variable is *WithAnalyst*, which is an indicator variable that equals one if a firm is covered by at least one analyst as recorded in I/B/E/S, and zero otherwise. Definitions of other variables are in the Appendix Table A. P-values based on robust standard errors clustered at establishment level are reported in parentheses under the corresponding estimated coefficients. ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Dependent Variable	(1) *TCR*	(2) *TCR*	(3) *TCR*	(4) *TCR*	(5) *TCR*	(6) *TCR*	(7) *TCR*	(8) *TCR*	(9) *TCR*
Ln(1+Coverage)	-0.805***	-0.271***	-0.497***	-0.411***	-0.259***	-0.191*	-0.257**		
	(0.000)	(0.002)	(0.000)	(0.000)	(0.003)	(0.093)	(0.020)		
WithAnalyst								-0.709***	-0.332*
								(0.000)	(0.051)
Ln(Assets)	0.321***	0.172***	-3.291***	-2.469***	0.159***	-0.138	-0.388*	0.115***	0.101**
	(0.000)	(0.001)	(0.000)	(0.000)	(0.002)	(0.546)	(0.063)	(0.003)	(0.021)
Leverage	-0.600	0.364	-1.004**	-0.803*	0.415	-0.227	-1.183**	-0.370	0.451
	(0.110)	(0.310)	(0.042)	(0.077)	(0.243)	(0.640)	(0.012)	(0.307)	(0.212)
PPE/Assets	7.524***	1.750***	-6.663***	-3.658***	1.844***	0.680	-4.948***	7.298***	1.805***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.495)	(0.000)	(0.000)	(0.000)
Sales/Assets	0.751***	0.373***	-2.450***	-2.192***	0.363***	-0.225	-0.481*	0.569***	0.387***
	(0.000)	(0.002)	(0.000)	(0.000)	(0.002)	(0.412)	(0.065)	(0.000)	(0.001)
CAPEX/Assets	4.153**	5.949***	16.017***	15.179***	5.665***	-3.765	7.485***	1.118	5.364***
	(0.042)	(0.003)	(0.000)	(0.000)	(0.004)	(0.160)	(0.001)	(0.592)	(0.006)
Market-to-Book	0.577***	0.265***	0.851***	0.773***	0.217**	-0.574***	0.351***	-0.177*	0.205**
	(0.000)	(0.005)	(0.000)	(0.000)	(0.020)	(0.000)	(0.008)	(0.058)	(0.025)
FCF/Assets	4.139***	2.586***	7.429***	6.964***	2.237***	2.144**	2.572***	4.005***	2.529***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.032)	(0.007)	(0.000)	(0.000)

Cash/Assets	1.387**	0.413	-4.394***	-3.829***	0.359	0.733	-1.148	2.989***	0.447
	(0.025)	(0.502)	(0.000)	(0.000)	(0.557)	(0.380)	(0.178)	(0.000)	(0.468)
Dividends/Assets	-32.912***	-16.912***	-73.665***	-62.681***	-16.782***	-12.146**	-35.694***	-11.724***	-16.720***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.021)	(0.000)	(0.003)	(0.000)
Ln(Number of Employee)	0.000*	0.000	0.001**	-0.000	0.000	-0.000	-0.000	0.000	0.000
	(0.098)	(0.358)	(0.043)	(0.801)	(0.331)	(0.847)	(0.749)	(0.151)	(0.357)
Hours Per Employee	-0.005***	-0.004***	-0.001***	-0.002***	-0.004***	-0.002***	-0.002***	-0.005***	-0.004***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Strike	1.676	1.156	0.471	1.440*	1.117	-0.037	0.194	1.313	1.187
	(0.101)	(0.217)	(0.526)	(0.070)	(0.236)	(0.946)	(0.754)	(0.169)	(0.205)
Shutdown	0.816***	0.967***	0.062	0.770***	0.902***	0.031	0.117	0.757***	0.976***
	(0.000)	(0.000)	(0.631)	(0.000)	(0.000)	(0.805)	(0.337)	(0.000)	(0.000)
Seasonal	0.228	0.420*	0.687***	0.915***	0.403*	0.248	0.493**	-0.227	0.426*
	(0.353)	(0.060)	(0.003)	(0.000)	(0.067)	(0.251)	(0.027)	(0.353)	(0.056)
Disaster	-0.422	0.145	0.067	0.233	0.208	-0.160	-0.508	-0.400	0.149
	(0.419)	(0.758)	(0.892)	(0.577)	(0.657)	(0.736)	(0.296)	(0.421)	(0.752)
Industry Fixed Effects	NO	YES	YES	YES	YES	NO	NO	YES	YES
Establishment Fixed Effects	NO	NO	YES	NO	NO	YES	YES	NO	YES
Firm Fixed Effects	NO	NO	NO	YES	NO	NO	NO	NO	NO
Year Fixed Effects	NO	YES	NO	NO	NO	NO	NO	YES	NO
Year and Industry Fixed Effects	NO	NO	NO	NO	NO	YES	NO	NO	NO
Year and State Fixed Effects	NO	NO	NO	NO	YES	NO	YES	NO	NO
Observations	31,336	31,336	31,336	31,336	31,336	31,336	31,336	31,336	31,336
Adjusted R^2	0.157	0.286	0.624	0.421	0.299	0.665	0.649	0.203	0.624

Table 3

Analyst Coverage and Workplace Safety: Alternative Measures of Injury Rate.

This table presents the relationship between analyst coverage and workplace safety using alternative measures of injury rate. The sample consists of establishments from Occupational Safety and Health Administration (OSHA) during 2002-2011 that belong to non-financial and non-utility firms. In columns (1)-(4), the dependent variable is *Total Case*, which is the sum of deaths and all injuries and illnesses that result in days away from work or with job restriction or transfer, and other recordable cases. In columns (1)-(2), we run Poisson regressions and in columns (3)-(4), we run Negative Binomial Regression. In columns (5)-(6), the dependent variable is injury rate with days away, restricted, or transferred (*DART*), which is the number of injuries and illnesses that result in days away from work or with job restriction or transfer, divided by the number of hours worked by all employees in a given establishment-year, then multiplied by 200,000. In columns (7)-(8), the dependent variable is injury rate with days away from work (*DAFWII*), which is the number of injuries and illnesses that result in days away from work, divided by the number of hours worked by all employees in a given establishment-year, then multiplied by 200,000. The independent variable is the natural logarithm of one plus analyst coverage, where *Coverage* is the arithmetic mean of the numbers of monthly earnings forecasts during each calendar year for each firm extracted from the I/B/E/S summary file. We include the same set of firm- and establishment-specific variables as those in Table 2, however not report for brevity. Definitions of those variables are in the Appendix Table A. P-values based on robust standard errors clustered at establishment level are reported in parentheses under the corresponding estimated coefficients. ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent Variable	*Total Case*	*Total Case*	*Total Case*	*Total Case*	*DART*	*DART*	*DAFWII*	*DAFWII*
Ln(1+Coverage)	-0.015***	-0.023***	-0.039***	-0.033***	-0.220***	-0.160*	-0.216***	-0.007
	(0.000)	(0.000)	(0.000)	(0.001)	(0.002)	(0.058)	(0.000)	(0.897)
Control Variables	YES	YES	YES	YES	YES	YES	YES	YES
Industry Fixed Effects	YES	NO	YES	NO	YES	NO	YES	NO
Establishment Fixed Effects	NO	YES	NO	YES	NO	YES	NO	YES
Year Fixed Effects	YES	NO	YES	NO	YES	NO	YES	NO
Year and Industry Fixed Effects	NO	YES	NO	YES	NO	YES	NO	YES
Regression Model	Poisson	Poisson	Negative Binomial	Negative Binomial	OLS	OLS	OLS	OLS
Observations	31,336	31,336	31,336	31,336	31,336	31,336	31,336	31,336

Table 4

Difference-in-Differences (DiD) Tests.

The table presents the difference-in-differences tests results on how exogenous shocks to analyst coverage (i.e. brokerage house closures and mergers) affect establishment level workplace safety during 2002-2011. The sample starts with all establishment-years from 2002 to 2011 with non-missing matching variables and non-missing workplace injury rates (*TCR*, *DART, DAFWII*) during a seven-year window (from year -3 to year +3) spanning the actual or matched event year. For each treated establishment, we identify control establishments by first selecting candidate control establishments in the same terciles of various characteristics, e.g., market value of equity (*MV*), book-to-market (*BM*), average monthly stock returns (*RET*), number of analyst coverage (*NOAN*), annualized daily stock return volatility (*VOL*), average monthly stock turnover (*TURN*), hours per employee (*HOUR*), and in the same Fama-French 10 industry (FF10), in the year prior to the event (year -1), and then selecting up to five establishments that have the closest number of analyst coverage as the treated establishment as the controls. We define *Treat* being one for the treated establishments and zero for the control establishments, *Post* being one for the post-event years and zero otherwise. The DiD regression is estimated where the dependent variable is *TCR*, *DART, or DAFWII*, and the independent variables are *Treat*, *Post*, and the interaction term of *Treat***Post*. For brevity, we only report the DiD estimates on the interaction term of *Treat***Post*. In Panel A, we report the DiD estimates based on a variety of matching criteria. In Panel B, we report the comparison of treated and control groups. P-values based on robust standard errors clustered at event (i.e. brokerage house closures and mergers) level are reported in parentheses under the corresponding estimated coefficients. ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Panel A: DiD Estimates Based on a Variety of Matching Criteria

Matching Criteria	*TCR*	*DART*	*DAFWII*
(1) MV/BM/RET/NOAN/FF10 matched	2.743***	2.007***	1.090***
	(0.000)	(0.000)	(0.000)
(2) MV/BM/RET/NOAN/FF10/HOUR matched	2.408***	1.987***	1.000***
	(0.000)	(0.000)	(0.000)
(3) MV/BM/RET/NOAN/VOL/FF10/TURN matched	3.664***	3.149***	0.919***
	(0.000)	(0.000)	(0.001)
(4) MV/BM/RET/NOAN/VOL/TURN/FF10/HOUR matched	2.984***	2.602***	1.032***
	(0.000)	(0.000)	(0.000)
(5) MV/BM/RET/NOAN/VOL/FF10 matched	2.203***	1.674***	0.885***
	(0.000)	(0.000)	(0.000)
(6) MV/BM/RET/NOAN/VOL/FF10/HOUR matched	2.428***	2.334***	1.044***
	(0.000)	(0.000)	(0.000)
(7) MV/BM/RET/NOAN/TURN/FF10 matched	1.796***	1.945***	0.691***
	(0.000)	(0.000)	(0.001)
(8) MV/BM/RET/NOAN/TURN/FF10/HOUR matched	2.485***	2.479***	0.871***
	(0.000)	(0.000)	(0.000)
(9) MV/BM/RET/VOL/FF10 matched	2.793***	2.385***	0.724***
	(0.000)	(0.000)	(0.001)
(10) MV/BM/RET/VOL/FF10/HOUR matched	1.835**	1.718**	0.759***
	(0.040)	(0.013)	(0.002)

Panel B: Comparison of Treated and Control Sample

	Treat	Control	Diff (Treat - Control)	P-Value
MV (in $billions)	4.055	4.308	-0.253	0.376
Book to Market	0.465	0.479	-0.014	0.287
Number of Analysts	17.051	17.366	-0.315	0.292
Volatility	0.021	0.021	0.000	0.581
Return	0.002	0.001	0.002	0.266
Turnover	1.620	1.630	-0.010	0.877
Hours Per Employee (in 000s)	845.259	816.284	28.975	0.714

Table 5

Cross-sectional analysis.

This table presents the results of the relationship between analyst coverage and workplace safety conditional on union power and analyst characteristics. The sample consists of establishments from Occupational Safety and Health Administration (OSHA) during 2002-2011 that belong to non-financial and non-utility firms. In Panel A, *Low Union Membership* is an indicator variable that equals one if an establishment is from an industry with union membership below the sample median in a year, and zero otherwise; *Low Bargain Agreement* is an indicator variable that equals one if an establishment is from an industry with collective bargaining agreement coverage below the sample median in a year, and zero otherwise. In Panel B, *% of Star Analysts Converge* is the ratio of all-star analysts to the total number of analyst coverage. *WithStarAnalyst* is an indicator variable that equals one if a firm is covered by at least one all-star analyst, and zero otherwise. All-star analysts are those who are named to All-American Research Team in the current years' October issue of *Institutional Investor* magazine. *Ln(1+Coverage)* is the natural logarithm of one plus analyst coverage, where *Coverage* is the arithmetic mean of the numbers of monthly earnings forecasts during each calendar year for each firm extracted from the I/B/E/S summary file. In Panel C, *Ln(1+Number of Local Analysts)* is the natural logarithm of one plus the number of analysts who are within 100 km of the covered establishment, and *Ln(1+Number of Distant Analysts)* is the natural logarithm of one plus the number of analysts who are more than 100 km away from the covered establishment. We include the same set of firm- and establishment-specific variables as those in Table 2, however not report for brevity. Definitions of those variables are in the Appendix Table A. P-values based on robust standard errors clustered at establishment level are reported in parentheses under the corresponding estimated coefficients. ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Panel A: Union Power

Dependent Variable	(1) *TCR*	(2) *TCR*
*Low Union Membership*Ln(1+Coverage) [β]*	-0.341***	
	(0.001)	
Low Union Membership	-0.668***	
	(0.003)	
*Low Bargain Agreement*Ln(1+Coverage) [β]*		-0.371***
		(0.000)
Low Bargain Agreement		-0.351
		(0.108)
Ln(1+Coverage) [γ]	-0.153	-0.139
	(0.125)	(0.163)
Control Variables	YES	YES
Industry Fixed Effects	YES	YES
Year Fixed Effects	YES	YES
$\beta+\gamma$	-0.494***	-0.510***
P-value of F-Test: $\beta+\gamma=0$	(0.000)	(0.000)
Observations	31,336	31,336
Adjusted R^2	0.294	0.292

Panel B: All-Star Analysts

Dependent Variable	(1) *TCR*	(2) *TCR*
% of Star Analyst Converge	-2.213***	
	(0.000)	
WithStarAnalyst		-0.527***
		(0.006)
Ln(1+Coverage)	-0.662***	-0.530***
	(0.000)	(0.001)
Control Variables	YES	YES
Industry Fixed Effects	YES	YES
Year Fixed Effects	YES	YES
Observations	26,525	31,336
Adjusted R^2	0.306	0.304

Panel C: Local vs. Distant Analysts

Dependent Variable	(1) *TCR*	(2) *TCR*	(3) *TCR*
Ln(1+Number of Local Analysts) (β_1)	-0.082***		-0.121***
	(0.000)		(0.000)
Ln(1+Number of Distant Analysts) (β_2)		-0.054***	-0.063***
		(0.000)	(0.000)
χ^2 *of F-Test* ($\beta_1 = \beta_2$)			3.65*
			(0.056)
Control Variables	YES	YES	YES
Industry Fixed Effects	YES	YES	YES
Year Fixed Effects	YES	YES	YES
Observations	31,336	31,336	31,336
Adjusted R^2	0.286	0.287	0.288

Table 6

Analyst Coverage and Workplace Safety Incentive in Managerial Compensation.

This table presents the results of logit regressions that estimate the relationship between analyst coverage and the use of workplace safety metrics in the executive compensation package. The sample consists of non-financial and non-utility firms covered by both the Occupational Safety and Health Administration (OSHA) and the Incentive Lab Database during 2002-2011. Dependent variable is *Safety Incentive*, which equals one if the firm adopts workplace safety related metrics in executive compensation contracts identified as recorded in the Incentive Lab Database, and zero otherwise. Independent variable in columns (1)−(2) is the natural logarithm of one plus analyst coverage, where *Coverage* is the arithmetic mean of the numbers of monthly earnings forecasts during each calendar year for each firm extracted from the I/B/E/S summary file. Independent variable in columns (3) − (4) is the *Ln(1+Coverage)* that is instrumented using expected coverage. Definitions of other variables are in the Appendix Table A. P-values based on robust standard errors clustered at firm level are reported in parentheses under the corresponding estimated coefficients. ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Dependent Variable	(1) *Safety Incentive*	(2) *Safety Incentive*	(3) *Safety Incentive*	(4) *Safety Incentive*
Ln(1+Coverage)	0.407**	0.490*		
	(0.050)	(0.078)		
Ln(1+Coverage) (Instrumented)			0.730**	0.865*
			(0.013)	(0.086)
Business Segments	0.119***	0.072	0.116***	0.066
	(0.005)	(0.127)	(0.005)	(0.157)
Industry-Adjusted Stock Return	-2.461	-5.013	-2.503	-5.199
	(0.607)	(0.337)	(0.604)	(0.318)
Inst.Ownership	1.336**	2.505***	1.418**	2.692***
	(0.036)	(0.004)	(0.030)	(0.002)
Volatility	11.706	11.877	11.171	10.231
	(0.261)	(0.445)	(0.289)	(0.507)
Investment/Assets	-2.282	-6.022*	-2.228	-6.504*
	(0.252)	(0.077)	(0.248)	(0.061)
Market Value of Equity	0.001	-0.002	-0.001	-0.004
	(0.718)	(0.578)	(0.831)	(0.371)
Board Size	-0.486***	-0.337**	-0.468***	-0.336**
	(0.000)	(0.034)	(0.000)	(0.032)
% of IndBoard	0.577***	0.420***	0.546***	0.408***
	(0.000)	(0.004)	(0.000)	(0.005)
Industry Fixed Effects	NO	YES	NO	YES
Year Fixed Effects	NO	YES	NO	YES
Observations	1,887	1,887	1,887	1,887

Table 7
Analyst Coverage and Firms' Workplace Safety Practice.

This table presents the results on relationship between analyst coverage and firms' practice in workplace safety. The sample consists of non-financial and non-utility firms covered by both the Occupational Safety and Health Administration (OSHA) and the KLD Database during 2002-2011. KLD assigns 0/1 rating for both workplace safety strength index and workplace safety weakness index. The dependent variable is *Safety Index*, which is workplace safety strength index minus workplace safety weakness index. We estimate OLS and Ordered Logit regressions in columns (1) and (2), respectively. Independent variable in columns (1)−(2) is the natural logarithm of one plus analyst coverage, where *Coverage* is the arithmetic mean of the numbers of monthly earnings forecasts during each calendar year for each firm extracted from the I/B/E/S summary file. Independent variable in columns (3) − (4) is the *Ln(1+Coverage)* that is instrumented using expected coverage. Definitions of other variables are in the Appendix Table A. P-values based on robust standard errors clustered at firm level are reported in parentheses under the corresponding estimated coefficients. ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

	(1)	(2)	(3)	(4)
Dependent Variable	*Safety Index*	*Safety Index*	*Safety Index*	*Safety Index*
	OLS	*Ordered Logit*	*OLS*	*Ordered Logit*
Ln(1+Coverage)	0.032**	0.241**		
	(0.022)	(0.015)		
Ln(1+Coverage) (Instrumented)			0.025*	0.161*
			(0.055)	(0.078)
Blue State Dummy	0.028	0.188	0.034*	0.226**
	(0.122)	(0.108)	(0.051)	(0.037)
Ln(Assets)	-0.027***	-0.208***	-0.027***	-0.197***
	(0.001)	(0.000)	(0.000)	(0.000)
KZ Index	-0.002	-0.013	-0.000	-0.004
	(0.284)	(0.272)	(0.859)	(0.699)
ROA	0.081	0.539	0.100	0.608
	(0.218)	(0.383)	(0.111)	(0.273)
Cash/Assets	0.130**	1.136***	0.143***	1.075***
	(0.011)	(0.010)	(0.004)	(0.009)
Market-to-Book	-0.027	-0.087	-0.021	-0.042
	(0.507)	(0.781)	(0.576)	(0.885)
Dividends/Assets	0.383	2.110	0.501	2.958
	(0.503)	(0.610)	(0.364)	(0.441)
Industry Fixed Effects	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES
Observations	3,445	3,445	3,445	3,445

Table 8

Analyst Coverage and Workplace Safety Expenditures.

This table presents the results on relationship between analyst coverage and firms' workplace safety expenditures. The sample consists of non-financial and non-utility firms from Occupational Safety and Health Administration (OSHA) during 2002-2011. To estimate workplace safety expenditures, we follow Caskey and Ozel (2017) and run the following model based on Roychowdhury (2006) for each two-digit SIC coded industry in year t:

$$SG\&A_{(i,t)}/Emp_{(i,t-1)} = \beta_0 + \beta_1 *(1/Emp_{(i,t-1)}) + \beta_2 *(1/Emp_{(i,t-1)}) + e_{(i,t)}$$

where SG&A is a firm's selling, general and administrative expenses, Emp is the total number of employees in a firm, and Sales is the total sales of a firm. *Safety Expenditures* is obtained as the residual from the model, and we require at least 15 observations within each two-digit SIC code every year. Independent variable in columns (1) is the natural logarithm of one plus analyst coverage, where *Coverage* is the arithmetic mean of the numbers of monthly earnings forecasts during each calendar year for each firm extracted from the I/B/E/S summary file. Independent variable in columns (2) is the *Ln(1+Coverage)* that is instrumented using expected coverage. Definitions of other variables are in the Appendix Table A. P-values based on robust standard errors clustered at firm level are reported in parentheses under the corresponding estimated coefficients. ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Dependent Variable	(1) *Safety Expenditures*	(2) *Safety Expenditures*	(3) *Safety Expenditures*	(4) *Safety Expenditures*
Ln(1+Coverage)	10.338***	8.921***		
	(0.000)	(0.000)		
Ln(1+Coverage) (Instrumented)			11.912***	9.685***
			(0.000)	(0.000)
Ln(Assets)	-2.334*	-2.370*	-2.915**	-2.656**
	(0.057)	(0.052)	(0.026)	(0.039)
Leverage	-0.225	4.000	0.852	4.469
	(0.972)	(0.537)	(0.896)	(0.491)
PPE/Assets	-99.111***	-88.815***	-97.900***	-88.452***
	(0.000)	(0.000)	(0.000)	(0.000)
Sales/Assets	-17.326***	-17.796***	-17.147***	-17.715***
	(0.000)	(0.000)	(0.000)	(0.000)
CAPEX/Assets	63.986*	48.499	57.858	46.010
	(0.098)	(0.206)	(0.140)	(0.237)
Market-to-Book	14.614***	13.614***	14.265***	13.441***
	(0.000)	(0.000)	(0.000)	(0.000)
FCF/Assets	-23.845	-12.182	-24.210	-12.364
	(0.144)	(0.444)	(0.139)	(0.437)
Cash/Assets	60.840***	47.149***	59.959***	46.769***
	(0.000)	(0.001)	(0.000)	(0.001)
Dividends/Assets	-207.615***	-256.994***	-202.521**	-254.484***
	(0.009)	(0.001)	(0.011)	(0.001)
Industry Fixed Effects	NO	YES	NO	YES
Year Fixed Effects	NO	YES	NO	YES
Observations	6,135	6,135	6,135	6,135
Adjusted R^2	0.264	0.314	0.264	0.314

Table 9

Analyst Coverage and Conference Calls.

This table presents the results on relationship between analyst coverage and firms' practice in workplace safety. The sample consists of non-financial and non-utility firms covered by both the Occupational Safety and Health Administration (OSHA) 2002-2011. We hand collect conference call information from Thomson Reuters StreetEvents. The dependent variable is a binary variable, *Safety Discussion*, which equals one if a firm's management discussed workplace safety related issues in conference calls and/or any analyst raises a question related to workplace safety at Q&A session, and zero otherwise. Independent variable in columns (1) − (2) is the natural logarithm of one plus analyst coverage, where *Coverage* is the arithmetic mean of the numbers of monthly earnings forecasts during each calendar year for each firm extracted from the I/B/E/S summary file. Independent variable in columns (3) − (4) is the *Ln(1+Coverage)* that is instrumented using expected coverage. Definitions of other variables are in the Appendix Table A. P-values based on robust standard errors clustered at firm level are reported in parentheses under the corresponding estimated coefficients. ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

	(1)	(2)	(3)	(4)
Dependent Variable	*Safety Discussions*	*Safety Discussions*	*Safety Discussions*	*Safety Discussions*
Ln(1+Coverage)	0.529***	0.521***		
	(0.000)	(0.003)		
Ln(1+Coverage) (Instrumented)			0.422***	0.315*
			(0.005)	(0.083)
Ln(Sales)	0.099	0.164*	0.140*	0.228**
	(0.153)	(0.055)	(0.064)	(0.020)
Leverage	0.065	-0.176	-0.089	-0.155
	(0.872)	(0.747)	(0.834)	(0.777)
Market-to-Book	-0.617***	-0.391*	-0.587***	-0.347*
	(0.001)	(0.053)	(0.002)	(0.088)
Volatility	0.097	1.226	2.467	-1.006
	(0.987)	(0.892)	(0.664)	(0.912)
Market Value of Equity	0.005***	0.001	0.004**	0.001
	(0.005)	(0.541)	(0.013)	(0.593)
ROA	0.171	-0.461	0.223	-0.513
	(0.895)	(0.745)	(0.866)	(0.716)
Litigation Industry	-0.104	-0.093	-0.039	-0.014
	(0.516)	(0.904)	(0.811)	(0.986)
R&D/Assets	-35.315***	-35.319***	-35.490***	-34.250***
	(0.000)	(0.000)	(0.000)	(0.000)
Industry Fixed Effects	NO	YES	NO	YES
Year Fixed Effects	NO	YES	NO	YES
Observations	5,825	5,825	5,825	5,825

Appendix Table A

Variable Definitions

Variables	Definitions
Establishment-Specific Variables	
TCR	Sum of deaths and all injuries and illnesses that result in days away from work or with job restriction or transfer, and other recordable cases divided by the number of hours worked by all employees in a given establishment-year, then multiplied by 200,000.
DART	The number of injuries and illnesses that result in days away from work or with job restriction or transfer, divided by the number of hours worked by all employees in a given establishment-year, then multiplied by 200,000
DAFWII	The number of injuries and illnesses that result in days away from work, divided by the number of hours worked by all employees in a given establishment-year, then multiplied by 200,000
Total Case	Sum of deaths and all injuries and illnesses that result in days away from work or with job restriction or transfer, and other recordable cases.
TCR	Sum of deaths and all injuries and illnesses that result in days away from work or with job restriction or transfer, and other recordable cases divided by the number of hours worked by all employees in a given establishment-year, then multiplied by 200,000.
DART	The number of injuries and illnesses that result in days away from work or with job restriction or transfer, divided by the number of hours worked by all employees in a given establishment-year, then multiplied by 200,000
DAFWII	The number of injuries and illnesses that result in days away from work, divided by the number of hours worked by all employees in a given establishment-year, then multiplied by 200,000
Total Case	Sum of deaths and all injuries and illnesses that result in days away from work or with job restriction or transfer, and other recordable cases.
Number of Employee	Total number of employees working in a given establishment during the year.
Hours Per Employee	Total number of annual hours worked in a given establishment divided by the number of employees.
Strike	Indicator variable that equals one if there was a strike in the establishment during the year, and zero otherwise.
Shutdown	Indicator variable that equals one if there was a shutdown in the establishment during the year, and zero otherwise.
Seasonal	Indicator variable that equals one if the establishment

	employs seasonal workers, and zero otherwise.
Disaster	Indicator variable that equals one if the establishment is affected by adverse weather conditions or natural disasters during the year, and zero otherwise.
Firm-Specific Variables	
Coverage	The arithmetic mean of the numbers of monthly earnings forecasts during each calendar year for each firm extracted from the I/B/E/S summary file.
WithAnalyst	Indicator variable that equals one if a firm is covered by at least one analyst as recorded in I/B/E/S, and zero otherwise.
All-Star Analysts	Analysts who are named to All-American Research Team in the current year' October issue of *Institutional Investor* magazine.
% of Star Analysts Converge	The ratio of all-star analysts to the total number of analyst coverage
WithStarAnalyst	Indicator variable that equals one if a firm is covered by at least one all-star analyst, and zero otherwise
Meet/Beat	Indicator variable that equals one if a firm meets or beats analysts' consensus earnings forecasts by two cents or less, and zero otherwise. The consensus earnings forecast is computed based on each analyst's latest forecast issued between 180 to 4 days before earnings announcement.
Number of Local Analysts	The number of analysts who are within 100 km of the covered establishment.
Number of Distant Analysts	The number of analysts who are more than 100 km away from covered establishment.
Assets	Book value of total assets measured at the end of each fiscal year.
Leverage	Firm's total short-term and long-term debt divided by total assets.
PPE/Assets	Firm's net property, plant, and equipment divided by total assets.
Sales/Assets	Firm's total sales divided by total assets.
CAPEX/Assets	Firm's capital expenditure divided by total assets.
Market-to-Book	Firm's market value of assets divided by book value of assets. Market value of assets equals the sum of market value of equity, book value of total liabilities, and liquidation value of preferred stock minus deferred tax liabilities.
FCF/Assets	Firm's total free cash flows divided by total assets, which equals (oibdq-xint-txdi-capx)/at.
Cash/Assets	Firm's cash and short-term investments divided by total assets.
Dividends/Assets	Firm's total cash dividends paid to common shares divided by total assets.
Inst.Ownership	Percentage of shares held by institutional investors, averaged over the four quarters in a year.

Volatility	Annualized daily stock return volatility.
Investment/Assets	Sum of R&D, advertising, and capital expenditures, divided by total assets.
Board Size	Number of directors on the board.
% of IndBoard	Percentage of independent directors on the board.
Industry-Adjusted Stock Return	The annual compounded stock return of the sample firm minus the median annual compounded stock return of all firms in the same two digits-SIC code.
Business Segments	Total number of business segments obtained from the Compustat industry segment file.
Safety Incentive	Indicator variable that equals one if the firm adopts workplace safety related metrics in executive compensation contracts identified using the Incentive Lab Database, and zero otherwise.
Safety Index	Workplace safety strength index minus workplace safety weakness index provided by KLD database.
Blue State Dummy	Indicator variable that equals one if a firm's headquarters is located in a blue or Democratic state, and zero otherwise.
ROA	Firm's operating income before depreciation divided by total assets.
Market Value of Equity	Firm's fiscal year end price times fiscal year end shares outstanding.
KZ Index	An index that measures a firm's reliance on external financing, introduced by Kaplan and Zingales (1997).
Safety Discussions	Indicator variable that equals one if a firm's management discussed workplace safety related issues in conference calls or any analyst raises a question related to workplace safety at Q&A session, and zero otherwise
Litigation Industry	Indicator variable that equals one if a firm is in a high litigation risk industry, and zero otherwise. SIC codes 2833-2836, 3570-3577, 7370-7374, 3600-3675, 5200-5961, and 8731-8734 are defined as high litigation risk industries.
R&D/Assets	R&D expenses divided by total assets.
Sales	Total sales.
Industry-Specific Variables	
Low Union Membership	Indicator variable that equals one if an establishment is from an industry with union membership below the sample median in a year, and zero otherwise.
Low Bargain Agreement	Indicator variable that equals one if an establishment is from an industry with collective bargaining agreement coverage below the sample median in a year, and zero otherwise.

Appendix Table B

Analyst Coverage and Workplace Safety: Controlling for Earnings Forecasts Pressure.

This table presents the results of OLS regressions that estimate the relationship between analyst coverage and workplace safety. The sample consists of establishments from Occupational Safety and Health Administration (OSHA) during 2002-2011 that belong to non-financial and non-utility firms. For all specifications, the dependent variable is total case rate (*TCR*), which is the sum of deaths and all injuries and illnesses that result in days away from work or with job restriction or transfer, and other recordable cases divided by the number of hours worked by all employees in a given establishment-year, then multiplied by 200,000. The independent variable is the natural logarithm of one plus analyst coverage, where *Coverage* is the arithmetic mean of the numbers of monthly earnings forecasts during each calendar year for each firm extracted from the I/B/E/S summary file. We control for *Meat/Beat,* an indicator variable that equals one if a firm meets or beats analysts' consensus earnings forecasts by $.01 or $.02, and zero otherwise. Definitions of other variables are in the Appendix Table A. P-values based on robust standard errors clustered at establishment level are reported in parentheses under the corresponding estimated coefficients. ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dependent Variable	*TCR*	*TCR*	*TCR*	*TCR*	*TCR*	*TCR*	*TCR*
Ln(1+Coverage)	-0.910***	-0.344***	-0.531***	-0.456***	-0.330***	-0.215*	-0.301***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.059)	(0.007)
Meet/Beat	0.881***	0.635***	0.358***	0.478***	0.622***	0.254***	0.468***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.002)	(0.000)
Ln(Assets)	0.333***	0.184***	-3.246***	-2.419***	0.170***	-0.111	-0.326
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.626)	(0.116)
Leverage	-0.515	0.380	-0.992**	-0.752*	0.430	-0.217	-1.251***
	(0.171)	(0.289)	(0.045)	(0.098)	(0.226)	(0.654)	(0.008)
PPE/Assets	7.546***	1.886***	-6.330***	-3.309***	1.977***	0.773	-4.547***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.437)	(0.000)
Sales/Assets	0.797***	0.413***	-2.456***	-2.189***	0.402***	-0.225	-0.497*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.413)	(0.056)
CAPEX/Assets	3.575*	5.389***	16.527***	15.638***	5.105***	-3.480	7.889***
	(0.078)	(0.006)	(0.000)	(0.000)	(0.009)	(0.195)	(0.001)
Market-to-Book	0.484***	0.211**	0.795***	0.711***	0.163*	-0.592***	0.300**
	(0.000)	(0.027)	(0.000)	(0.000)	(0.083)	(0.000)	(0.023)
FCF/Assets	3.611***	2.219***	7.340***	6.812***	1.872***	2.098**	2.439**
	(0.000)	(0.002)	(0.000)	(0.000)	(0.008)	(0.036)	(0.011)
Cash/Assets	1.557**	0.557	-4.271***	-3.716***	0.495	0.728	-1.004

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	(0.012)	(0.366)	(0.000)	(0.000)	(0.419)	(0.383)	(0.238)
Dividends/Assets	-30.700***	-15.914***	-72.670***	-61.472***	-15.785***	-11.615**	-34.250***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.027)	(0.000)
Ln(Number of Employee)	0.000*	0.000	0.001**	-0.000	0.000	-0.000	-0.000
	(0.096)	(0.379)	(0.048)	(0.761)	(0.348)	(0.824)	(0.679)
Hours Per Employee	-0.005***	-0.004***	-0.001***	-0.002***	-0.004***	-0.002***	-0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Strike	1.712*	1.169	0.478	1.445*	1.124	-0.032	0.194
	(0.093)	(0.210)	(0.521)	(0.068)	(0.234)	(0.954)	(0.756)
Shutdown	0.854***	0.982***	0.077	0.788***	0.916***	0.040	0.133
	(0.000)	(0.000)	(0.548)	(0.000)	(0.000)	(0.747)	(0.275)
Seasonal	0.213	0.402*	0.677***	0.907***	0.387*	0.241	0.476**
	(0.385)	(0.072)	(0.003)	(0.000)	(0.080)	(0.265)	(0.032)
Disaster	-0.369	0.195	0.064	0.249	0.252	-0.154	-0.497
	(0.477)	(0.678)	(0.898)	(0.553)	(0.590)	(0.747)	(0.309)
Industry Fixed Effects	NO	YES	YES	YES	YES	NO	NO
Establishment Fixed Effects	NO	NO	YES	NO	NO	YES	YES
Firm Fixed Effects	NO	NO	NO	YES	NO	NO	NO
Year Fixed Effects	NO	YES	NO	NO	NO	NO	NO
Year and Industry Fixed Effects	NO	NO	NO	NO	NO	YES	NO
Year and State Fixed Effects	NO	NO	NO	NO	YES	NO	YES
Observations	31,336	31,336	31,336	31,336	31,336	31,336	31,336
Adjusted R^2	0.159	0.287	0.625	0.422	0.301	0.665	0.650

Appendix Table C

Firm Level Tests.

This table presents the relationship between analyst coverage and workplace safety aggregated at the firm-level. In Panel A, the independent variable is the natural logarithm of one plus analyst coverage, where *Coverage* is the arithmetic mean of the numbers of monthly earnings forecasts during each calendar year for each firm extracted from the I/B/E/S summary file. In Panel B, independent variable is the *Ln(1+Coverage)* that is instrumented using expected coverage. In columns (1)-(3) of both panels, we run OLS regressions with the dependent variable being *TCR (Firm)*, which is the sum of deaths and all injuries and illnesses from all establishments in a firm divided by sum of employees of all establishments. In columns (4)-(7) of both panels, the dependent variable is *Total Case (Firm)*, which is the sum of deaths and all injuries and illnesses from all establishments in a firm. We run Poisson regressions in columns (4)-(5), and Negative Binomial Regressions in columns (6)-(7). We include the same set of firm-level variables as those in Table 2, however not report for brevity. Definitions of those variables are in the Appendix Table A. P-values based on robust standard errors clustered at firm-level are reported in parentheses under the corresponding estimated coefficients. ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Panel A: Uninstrumented Independent Variable

Dependent Variable	(1) *TCR (Firm)*	(2) *TCR (Firm)*	(3) *TCR (Firm)*	(4) *Total Case (Firm)*	(5) *Total Case (Firm)*	(6) *Total Case (Firm)*	(7) *Total Case (Firm)*
Ln(1+Coverage)	-5.114***	-3.110**	-2.172*	-0.023***	-0.037***	-0.052***	-0.030**
	(0.000)	(0.016)	(0.094)	(0.000)	(0.000)	(0.000)	(0.021)
Firm Control Variables	YES	YES	YES	YES	YES	YES	YES
Industry Fixed Effects	NO	YES	NO	YES	NO	YES	NO
Firm Fixed Effects	NO	NO	YES	NO	YES	NO	YES
Year Fixed Effects	NO	YES	YES	YES	YES	YES	YES
Regression Model	OLS	OLS	OLS	Poisson	Poisson	Negative Binomial	Negative Binomial
Observations	6,930	6,930	6,930	6,930	6,930	6,930	6,930

Panel B: Instrumented Independent Variable

Dependent Variable	(1) *TCR (Firm)*	(2) *TCR (Firm)*	(3) *TCR (Firm)*	(4) *Total Case (Firm)*	(5) *Total Case (Firm)*	(6) *Total Case (Firm)*	(7) *Total Case (Firm)*
Ln(1+Coverage)	-7.911***	-2.911***	-1.801	-0.056***	-0.083***	-0.072***	-0.050***
	(0.000)	(0.002)	(0.276)	(0.000)	(0.000)	(0.000)	(0.008)
Firm Control Variables	YES	YES	YES	YES	YES	YES	YES
Industry Fixed Effects	NO	YES	NO	YES	NO	YES	NO
Firm Fixed Effects	NO	NO	YES	NO	YES	NO	YES
Year Fixed Effects	NO	YES	YES	YES	YES	YES	YES
Regression Model	OLS	OLS	OLS	Poisson	Poisson	Negative Binomial	Negative Binomial
Observations	6,930	6,930	6,930	6,930	6,930	6,930	6,930

Appendix Table D

Analyst Coverage and Workplace Safety: Instrumental Variable Two-stage Least Squares (IV−2SLS) Regressions.

This table presents the results of IV−2SLS regressions that estimate the relationship between analyst coverage and workplace safety, using expected analyst coverage (*ExpCoverage)* as the instrumental variable. The sample consists of establishments from Occupational Safety and Health Administration (OSHA) during 2002-2011 that belong to non-financial and non-utility firms. In Panel A, we report the first-stage regression results. The dependent variables are the natural logarithm of one plus analyst coverage, where *Coverage* is the arithmetic mean of the numbers of monthly earnings forecasts during each calendar year for each firm extracted from the I/B/E/S summary file. *ExpCoverage* is the instrument variable that is computed based on equations (1)−(2). In Panel B, the dependent variable is total case rate (*TCR*), which is the sum of deaths and all injuries and illnesses that result in days away from work or with job restriction or transfer, and other recordable cases divided by the number of hours worked by all employees in a given establishment-year, then multiplied by 200,000. The fitted value of *Ln(1+Coverage)* from the first-stage regressions is used as the instrumented *Ln(1+Coverage)* in the second-stage regressions. We include the same set of firm- and establishment-specific variables as those in Table 2, however not report for brevity. Definitions of other variables are in the Appendix Table A. P-values based on robust standard errors clustered at establishment level are reported in parentheses under the corresponding estimated coefficients. ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Panel A: First Stage Regressions

Dependent Variable	(1) *Ln(1+Coverage)*	(2) *Ln(1+Coverage)*	(3) *Ln(1+Coverage)*	(4) *Ln(1+Coverage)*	(5) *Ln(1+Coverage)*	(6) *Ln(1+Coverage)*	(7) *Ln(1+Coverage)*
ExpCoverage	0.564***	0.655***	0.364***	0.351***	0.656***	0.501***	0.484***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Control Variables	YES	YES	YES	YES	YES	YES	YES
Industry Fixed Effects	NO	YES	YES	YES	YES	NO	NO
Establishment Fixed Effects	NO	NO	YES	NO	NO	YES	YES
Firm Fixed Effects	NO	NO	NO	YES	NO	NO	NO
Year Fixed Effects	NO	YES	NO	NO	NO	NO	NO
Year and Industry Fixed Effects	NO	NO	NO	NO	NO	YES	NO
Year and State Fixed Effects	NO	NO	NO	NO	YES	NO	YES
Observations	31,336	31,336	31,336	31,336	31,336	31,336	31,336
Adjusted R^2	0.902	0.936	0.955	0.957	0.937	0.970	0.966

Panel B: Second Stage Regressions

Dependent Variable	(1) *TCR*	(2) *TCR*	(3) *TCR*	(4) *TCR*	(5) *TCR*	(6) *TCR*	(7) *TCR*
Ln(1+Coverage) (Instrumented)	-1.209***	-0.317***	-1.773***	-1.501***	-0.307***	-0.271*	-0.391***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.055)	(0.006)
Control Variables	YES	YES	YES	YES	YES	YES	YES
Industry Fixed Effects	NO	YES	YES	YES	YES	NO	NO
Establishment Fixed Effects	NO	NO	YES	NO	NO	YES	YES
Firm Fixed Effects	NO	NO	NO	YES	NO	NO	NO
Year Fixed Effects	NO	YES	NO	NO	NO	NO	NO
Year and Industry Fixed Effects	NO	NO	NO	NO	NO	YES	NO
Year and State Fixed Effects	NO	NO	NO	NO	YES	NO	YES
Observations	31,336	31,336	31,336	31,336	31,336	31,336	31,336
Adjusted R^2	0.160	0.286	0.627	0.423	0.300	0.665	0.649