

# Executive Fiduciary Duties and Workplace Safety\*

Sichen Shen  
Wuhan University

Vijay Yerramilli  
University of Houston

Hong Zou  
University of Hong Kong

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## Abstract

Does enhanced legal accountability of non-director executives improve workplace safety? Exploiting an exogenous increase in executive accountability triggered by Delaware Supreme Court’s 2009 “Gantler ruling”, we show that the workplace injury rate in establishments of Delaware-incorporated firms significantly decreases after the Gantler ruling compared to a control group consisting of similar establishments in non-Delaware-incorporated firms. This effect is more pronounced in firms where all risk executives do not serve on the board, firms where non-board-serving risk executives possess greater power, or firms that already had enterprise risk management infrastructure in place prior to the Gantler ruling. However, the impact is lessened by pre-existing financial constraints. This study adds to the limited research on non-director executive accountability and on the efficacy of corporate operational risk management.

Keywords: Executive fiduciary duties, Workplace safety, Risk management, Gantler ruling

JEL code: G32, K22, K32, J28

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\* The authors can be contacted via [scshen@whu.edu.cn](mailto:scshen@whu.edu.cn), [vyerramilli@bauer.uh.edu](mailto:vyerramilli@bauer.uh.edu), and [hongzou@hku.hk](mailto:hongzou@hku.hk). We thank the helpful comments of seminar participants at Renmin University, Wuhan University, Xiamen University, the Modern Risk Society seminar, the 2022 Asian Finance Association conference, Joan Schmit (the editor), Mike Adams, Jing Ai, Jiang Cheng (discussant), Emirhan Ilhan, Yueran Ma, Emmanuel Ofosu (discussant), Varun Sharma, Yanyan Wang, Youchang Wu, Yuhui Wu, Jiajie Xu, and Jianren Xu. We are grateful to Jianren Xu who kindly shared with us the data on ERM adoptions. Zou acknowledges the financial support of the University of Hong Kong Seed Fund for Basic Research (#11159198) for the project.

# Executive Fiduciary Duties and Workplace Safety

## 1. Introduction

Workplace injuries are a significant risk for workers; and the economic burden from these fortuitous events in the United States is estimated to be about \$250 billion each year on medical and indirect costs (Leigh, 2011). Cohn and Wardlaw (2016) find that a one-standard-deviation increase in workplace injury rates decreases firm value by 6.1% in their sample, suggesting that workplace injuries are costly for firms and their shareholders despite the prevalence of workers' compensation insurance.<sup>1</sup> Firms can mitigate such risks by enhancing the quality of risk management and investing in workplace safety. Recent literature in finance highlights that firms' financial constraints (Cohn and Wardlaw, 2016) and private status (Liang, Qi, Zhang, and Zhu, 2023) have an adverse effect on workplace safety, whereas concentration in ownership following private equity buyouts (Cohn, Nestoriak, and Wardlaw, 2021) or stock analyst following (Bradley, Mao, and Zhang, 2022) leads to improvements in workplace safety. Because operational risk management falls within the purview of corporate executives (especially non-director executives), it is plausible that legal changes that impose legal liability on corporate executives may change risk executives' incentives and behaviors and hence affect workplace safety. Yet the literature has

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<sup>1</sup> All U.S. state have passed workers' compensation law that requires a firm to purchase workers' compensation insurance or to meet state rules to qualify itself as a self-insurer. In workers' compensation, the employer or its insurer is held to bear the absolute liability to pay for job-related injuries regardless of whether the injured worker has a fault or not. This absolute liability rule saves the need for the injured worker to sue employers for compensation and ensures prompt payment of the benefit to the injured or the victim's family. It is, however, important to note that carrying workers' compensation insurance does not fully shield a firm and shareholders from the adverse effects of workplace injuries because 1) a claim history can increase future insurance premium, which is ultimately borne by shareholders; 2) a workplace accident may cause business interruption and result in the loss of business income; 3) the firm needs to reimburse the insurer for the payment that exceeds regular workers' compensation benefits when the employer had willful/intentional misconduct, failed to comply with a health/safety regulation, or had knowingly employed workers in violation of law, etc., and needs to pay for regulatory fines (Rejda and McNamara, 2017). These help explain Cohn and Wardlaw's (2016) finding. It is also important to note that employers' absolute liability towards injured workers is different from the fiduciary duties of company directors and officers (D&Os) to shareholders and the potential shareholder litigation risk arising from perceived breach of such duties. As highlighted by the litigation cases that we review in Section 2.2, company D&Os can be sued in shareholder derivative suits for oversight failures and the ensuing violations of safety regulations that result in losses to the firm (e.g., regulatory fines and penalties) which are not covered by workers' compensation insurance or for misrepresentations of the company's workplace safety records and safety regulation compliances in corporate filings to the SEC that lead investors to overvalue the company's stock.

not examined whether enhanced legal accountability of non-director executives improves firms' workplace safety. We attempt to fill this gap in this paper.

While courts have long emphasized the fiduciary duties (i.e., the duty of loyalty and duty of care) of the board of directors, the question of whether *non-director* executives also owe fiduciary duties to shareholders has been a murky area until the ruling by the Delaware Supreme Court in *Gantler v. Stephens* in 2009 ("the Gantler ruling") (Hroblak and Murray, 2012). In that ruling, Delaware, renowned for its leading position in corporate law and being the most popular place for out-of-state incorporations, for the first time explicitly established that executives owe the same fiduciary duties as directors to shareholders, and can become liable for breach of such duties. The ruling is remarkable as it expands the discipline of executives from primarily internal administrative actions to external judicial scrutiny, and has been shown to affect firms' disclosure and financial reporting decisions (Levy, Shalev, and Zur, 2017) and acquisition decisions (Reza, 2020). We exploit this exogenous increase in executive legal accountability for Delaware-incorporated firms induced by the Gantler ruling in a difference-in-differences (DID) framework to examine the impact of executive legal accountability on workplace safety. As we explain in Section 2.2, the effect of the Gantler ruling on workplace safety is an empirical issue to explore.

Following the standard analytical approach in the workplace safety literature (e.g., Caskey and Ozel, 2017; Chen, Ofosu, Veeraraghavan, and Zolotoy, 2023; Liang et al., 2023), we use granular establishment-level safety data from the Occupational Safety and Health Act (OSHA) Data Initiative (ODI) and conduct our DID analysis at the establishment level.<sup>2</sup> The Delaware Supreme Court ruled in the Gantler case on January 27, 2009 and the ruling directly affects Delaware-incorporated firms with non-board-serving executives. Accordingly, in our baseline analysis, we define treatment establishments as those that belong to firms incorporated in Delaware in 2008 (i.e., the year before the Gantler ruling); our control establishments are propensity-score-

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<sup>2</sup> Nevertheless, our baseline result is robust to using workplace injuries aggregated at the firm-level (see Appendix A2).

matched establishments that belong to firms not incorporated in Delaware in 2008 and are in the same two-digit SIC industry. We measure employee safety as an establishment's incidence rates of injuries as well as incidence rates of severe injuries for every 100 employees working full time in a year. To capture the effect of the Gantler ruling in 2009, we start our sample from 2006, which is three years before the ruling, and end the sample in 2011 due to the unavailability of the ODI injury data after 2011.

The results from the DID analysis show that the injury rates and the severe injury rates of establishments belonging to Delaware-incorporated firms decrease significantly in the 2-year period following the Gantler ruling relative to similar establishments belonging to non-Delaware-incorporated firms. The effects are economically significant, and represent a reduction about 8-11% in injuries depending on which proxy is used. Consistent with a causal interpretation, there is no divergence in the trend of injury rates between Delaware-incorporated establishments and non-Delaware-incorporated control establishments in the 3-year period leading up to the event year (i.e., there is no evidence of violating the parallel trends assumption), and the divergence in trend appears one year after the 2009 Gantler ruling. Taken together, these findings suggest that enhancing the legal accountability of non-director executives leads to improvements in workplace safety.

We conduct robustness checks of this finding by scaling annual total number of injuries or severe injuries by the number of employees (rather than by total working hours). The tenor of our key finding is not affected. We also find similar results using an alternative measure obtained from a different data source, namely, the employee health and safety concern rating in MSCI ESG-KLD rating data that are consistently available in a longer sample period.

Our baseline analysis treats all Delaware (incorporated) firms as treated, regardless of whether their risk executives serve on the board of directors or not. Intuitively, the Gantler ruling should have the most significant impact on Delaware firms without any risk executive serving on

the board. To test this, we define a dummy variable that equals one if none of the C-suite executives who have certain responsibility for risk management (i.e., chief risk officer (CRO) or equivalent, chief compliance officer (CCO), and chief legal officer (CLO), and chief financial officer (CFO)) serve on the board of a firm.<sup>3</sup> We then implement a triple-differences analysis that not only compares the change in workplace safety around the Gantler ruling between Delaware establishments and non-Delaware establishments, but also measures how the effect on Delaware firms varies based on their exposure to the Gantler ruling. The results of the triple-differences analysis show that Delaware firms without any C-suite executive positions having a responsibility for risk management serving on the board experience a larger decrease in workplace employee injuries in the post-Gantler period. In addition, we show that the power of the risk executives not serving on the board in Delaware firms also matters for the reduction in workplace injuries around the Gantler ruling. Following Ellul and Yerramilli (2013), we proxy a risk executive's power by the ratio of his/her annual total compensation to the CEO's annual compensation. We define a risk executive as a high-power one if his/her relative compensation ratio is above the sample median in the year before the Gantler ruling. These results further affirm the effect of the Gantler ruling as a driving force for our finding of the improvement in workplace safety. Moreover, we find no significant evidence on the Gantler ruling's spillover to other non-Delaware states in our short window of analysis. It is plausible that such spillover takes some time to be observed.

We further find that the improvement in workplace safety following the Gantler ruling is stronger in firms that have already had enterprise risk management (ERM) in place, which suggests that executives are likely to better leverage the risk management infrastructure in place and enforce existing risk management rules more strictly when they are subject to legal accountability imposed by the Gantler ruling. We also find that the effect of the Gantler ruling on workplace safety is

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<sup>3</sup> While CEOs also have a responsibility for risk management, they are invariably a member of the board of directors and so are not affected by the Gantler ruling. In the rest of the paper, we broadly term executives with a certain risk management responsibility as "risk executives" for the convenience of discussion, and these executives include the CRO, CCO, CLO and CFO or their equivalents.

attenuated by a firm's pre-existing financial constraints measured by both the KZ Index (Kaplan and Zingales, 1997) and the WW index (Whited and Wu, 2006). The evidence is consistent with the adverse effect of financial constraints on workplace safety (Cohn and Wardlaw, 2016).

Since the Gantler ruling was delivered around the time of the 2008 financial crisis, a concern is that our results may be driven by the differential impacts of the financial crisis on Delaware-incorporated versus non-Delaware-incorporated firms. We mitigate this concern by showing that there is no significant difference in the change of ROA, annual stock return or employment growth rates around the 2008 financial crisis between Delaware-incorporated firms and other firms in our matched sample (see Appendix A3). In addition, in our analysis using the longer sample period of MSCI ESG-KLD rating data, our result is robust to the exclusion of years from 2008 to 2010. Therefore, it is unlikely that our finding is attributable to the differential effects of the 2008 financial crisis on Delaware and non-Delaware firms.

Our paper contributes to a growing literature that examines the connections between workplace safety and finance. Highlighting the role of financial frictions, Cohn and Wardlaw (2016) show that injury rates increase with leverage and negative cash flow shocks, and decrease with positive cash flow shocks. Cohn et al. (2021) find a large and persistent decline in establishment-level workplace injury rates after private equity buyouts of publicly traded U.S. firms, and show that private acquirers benefit from the decline in injury rates in the form of an increased probability of exit via IPO. Recent research also shows the monitoring role of public listing status (Liang et al., 2023) and stock analysts (Bradley et al., 2022) in improving workplace safety. We contribute to this literature by showing that enhanced legal accountability of corporate executives improves firms' workplace. Hence, our paper is related to the literature that emphasizes the disciplining role of shareholder litigation threat (see Guan, Zhang, Zheng, and Zou (2021) for a summary of the related literature).

Second, failures in operational risk management, such as workplace injuries, impose significant costs on firms. Yet, operational risk management has received limited attention in the extant literature on corporate risk management, which has hitherto mostly focused on risk management through financial derivatives (e.g., Allayannis and Weston, 2001; Adam and Fernando, 2006; Campello, Lin, Ma, and Zou, 2011). While operational risk management is important, it covers many different functional areas and its effectiveness is hard to measure directly. In this study, we use workplace safety as a lens through which we examine an important aspect of corporate operational risk management. Meanwhile, studies examining the determinants of enterprise-wide measures of risk at financial institutions have focused on the role of factors, such as the strength and independence of risk management (e.g., Ellul and Yerramilli, 2013), the expertise of directors (Minton, Taillard, and Williamson, 2014), or overall corporate governance (Erkens, Hung, and Matos, 2012). Our paper contributes to the corporate risk management literature by highlighting the effect of executive legal accountability on an important aspect of firms' operational risk management, namely, workplace safety.

In a recent related work, Gong, Guo, and Wang (2023) use the staggered passage of the Universal Demand law - which lowers the risk of derivative litigation faced by directors - to examine the effect of shareholder litigation risk on workplace safety. Our paper differs in the following important respects. First, while Gong et al. (2023) focus on the litigation risk of *directors who have always been subject to* fiduciary duties and hence litigation risk in company law, we focus on the role of *non-director* executives who are involved in day-to-day operational risk management but face little litigation risk related to breach of fiduciary duties before the Gantler ruling. Second, while Gong et al. (2023) focus only on derivatives lawsuits, our paper considers the risk of both derivative suits and securities class actions and their interrelation (e.g., securities class actions may trigger parallel derivative lawsuits). Third, our result also shows the importance of enterprise risk management as the risk management infrastructure to workplace safety

performance and so adds to growing interest in the efficacy of enterprise risk management (e.g., Ellul and Yerramilli, 2013). Our paper extends Gong et al. (2023) and, together with Gong et al. (2023), helps paint a more complete picture of how directors' and officers' liability in shaping workplace safety.

The rest of the paper proceeds as follows. In Section 2, we introduce the Delaware Supreme Court's 2009 *Gantler v. Stephens* ruling and develop hypotheses on the effect on executive fiduciary duties. In Section 3, we discuss the research design, sample selection, and summary statistics. Section 4 presents the empirical results and we conclude in Section 5.

## **2. Institutional Background and Hypotheses**

### *2.1 The Gantler v. Stephens ruling*

The plaintiff, Gantler, was a shareholder and former director of First Niles Financial, Inc. He alleged that William Stephens (the board chairman and CEO of the company), other directors, and a *non-director* officer (Lawrence Safarek who served as the vice president and treasurer) breached fiduciary duties by sabotaging the opportunities to sell the company and instead adopting a self-interest privatization proposal that was misleadingly disclosed to garner the approval of shareholders. Around early 2005, First Niles Financial received three bids from Cortland Bancorp, First Place Financial Corp., and a third purchaser. First Niles Financial's board did not consider the third bid because the bidder did not plan to retain existing directors, but requested the management to conduct due diligence on the first two offers in January 2005. Stephens and Safarek agreed, but failed, to provide due diligence reports to Cortland Bancorp, and this resulted in Cortland Bancorp's withdrawal of its bid. They did not submit the due diligence to First Place Financial Corp. until Cortland Bancorp had withdrawn the bid. During the process, the market declined and First Place Financial Corp. lowered the offer price, but the offer still appeared reasonable according to a financial advisor. First Niles Financial's board voted to reject First Place



Financial Corp.'s offer without any deliberation; the board instead discussed a plan proposed by William Stephens to privatize the company and approved it later in 2005. The defendants motioned to dismiss Gantler's allegation by invoking the business judgment rule, and the motion was granted by the Delaware Court of Chancery, but later overturned by the Delaware Supreme Court. The plaintiff's claim against the non-director executive Safarek was that he failed to provide the bidder with timely and complete information during due diligence, thereby breaching fiduciary duties owed to shareholders. This claim was supported by the Delaware Supreme Court.

Courts have long emphasized the fiduciary duties (i.e., duty of loyalty and duty of care) of the board of directors. However, the question of whether non-director executives also owe fiduciary duties to shareholders remained unclear until the Gantler ruling by the Delaware Supreme Court (Hroblak and Murray, 2012). In its Gantler ruling, the Delaware Supreme Court explicitly affirmed that executives/officers owe the same fiduciary duties as directors to shareholders, and since then, these new duties become a vital component of corporate governance (Johnson and Garvis, 2009; Shaner, 2014). Regarding the effects of the Gantler ruling, Levy et al. (2017) report that non-board-serving CFOs become more conservative in conference speeches and financial reporting, and disclose bad news earlier in response to the higher personal liability imposed on them by the ruling. Reza (2020) finds that firms whose officers were protected from the market discipline prior to 2009 by staggered board experience improved deal announcement returns post the Gantler ruling.

## *2.2 Hypothesis development*

We hypothesize that enhanced legal accountability helps incentivize non-director executives to improve the quality of operational risk management and invest in workplace safety, thus *leading to a reduction in workplace injuries*. There are three reasons.

First, after the Gantler ruling, non-director officers of Delaware firms owe fiduciary duties (including the duty of loyalty and duty of care) to shareholders, and are likely to face a higher shareholder derivative litigation risk for breaching fiduciary duties such as the oversight duty (part of the duty of loyalty) and duty of care because plaintiff attorneys would consider who are relevant fiduciaries in determining whom to be named as defendants in derivative suits. Derivative suits are brought by shareholders when they believe directors and executives have breached fiduciary duties and caused a loss to company. In relation to workplace safety, derivative suits can target the company's failure to comply with safety regulations and such failure results in significant losses (e.g., regulatory fines and penalties) to the firm. For example, after a 2010 explosion in a coal mine owned by Massey Energy Company (incorporated in Delaware) killing 29 miners, shareholders brought a derivative lawsuit against directors and certain non-director officers. The plaintiff asserted that the company's director and non-director officer Jeffrey M. Jarosinski (Massey's Chief Compliance Officer and Vice President of Finance) breached their fiduciary duties by disregarding mine safety regulations and failing to address poor safety conditions. Such compliance failure harmed Massey through large fines imposed on the company and lost cash flows from the destroyed mine. As we discuss in detail in footnote 1, these losses are not covered by workers' compensation insurance and the absolute liability rule applicable to workers' compensation does not immune company D&Os from shareholder litigation alleging safety/health regulation violations.

Similarly, after a fatal explosion in 2017, shareholders brought a derivative suit against Delaware-incorporated Anadarko Petroleum Corp's board and non-director officers (e.g., the Executive Vice President (Law and Chief Administrative Officer), the CFO) for abuse of control, gross mismanagement, waste of corporate assets, and violations of Sections 14(a), 10(b) and 20(a) of the Securities Exchange Act of 1934. Anadarko was assessed over \$9 billion in environmental fines and settlement payments between 2011 and 2014 due to its failure in safety and

environmental compliance. In 2021, shareholders derivatively sued Tyson Foods’s board of directors and CFO for breaching their fiduciary duties by engaging in and/or causing Tyson to engage in the COVID-19 Working Condition Misconduct. Tyson failed to maintain social distancing between workers and even the most basic preventive measures (e.g., taking workers’ temperatures, providing protective gear, telling sick workers to stay home), but claimed in regulatory filings that the health and safety of its staff is “top priority”.<sup>4</sup>

In the 1986 ruling of the case *In re Caremark International Inc. Derivative Litigation*, Delaware Chancery Court established that the duty of loyalty not only requires directors to refrain from self-dealing, but also make good-faith efforts to implement an oversight program over the company’s operations, and monitor the effectiveness of the oversight program (Latham & Watkins, 2020). In addition, the duty of care requires directors to adhere to a standard of reasonable care while performing any act. The oversight duty and duty of care also apply to the oversight of workplace safety risk. Health and human safety is one of the five types of derivative suits that lead to large-dollar-amount settlements (Huskins, 2020).

Given that corporate executives have close involvement, and wide latitude, in enforcing a company’s risk management policy in the day-to-day operation of a company, imposing fiduciary duties on non-director executives should improve their incentives regarding workplace safety management. Indeed, these non-director officers are likely in a better position to affect a firm’s workplace safety than part-time outside directors who typically meet several times a year and are not informed if the management chooses not to report workplace injuries and deaths to the board.

Second, in addition to derivative litigation risk, another source of litigation risk regarding workplace safety is securities class actions against companies’ misrepresentation of workplace

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<sup>4</sup> Shareholders of Cintas Corp. filed a derivative suit alleging that the board failed to ensure the company’s compliance with safety regulations and such failure resulted in a worker’s death in 2007 and \$3 million fines paid to OSHA for repeated safety violations. Cintas settled the lawsuit by agreeing to take measures to improve workplace safety. In the 2010 Deepwater Horizon oil spill accident, BP and certain D&Os were sued by shareholders for “[having] fostered a culture that put cost-cutting over safety before the deadly 2010 Gulf of Mexico oil spill.”

safety records, compliance of relevant regulations, and/or the impacts on a firm's operations and performance. In fact, all the previously mentioned company targets of derivative suits (Massey Energy, Anadarko Petroleum Corp, Tyson Foods, BP) were also targeted by securities class action suits for misleading investors on safety and compliance records and/or health and safety risk management policies. Again, workers' compensation insurance and the absolute liability rule applicable to workers' compensation does not protect company D&Os from the risk of securities class action. We argue that after the Gantler ruling, non-director officers are likely to face a higher *derivative* litigation risk for misrepresenting workplace safety records or workplace safety risk management because the filing of securities class action suits often triggers the filing of *parallel* derivative suits for the same cause of action such as misrepresentations (Davis, 2008; Erickson, 2010; Choi, Erickson, and Pritchard, 2017). Importantly, Choi et al. (2017) find that the plaintiff tends to name *more* non-director officers in parallel derivative suits than in the corresponding securities class action suits.<sup>5</sup>

Third, to the extent that plaintiff attorneys consider who are fiduciaries in determining which individuals to be listed as co-defendants together with their firm in securities class actions targeting misrepresentations of workplace safety record and compliance, non-director officer likely face a higher risk of being listed as co-defendants in securities class actions after the Gantler ruling.

Finally, though executives explicitly bear the same fiduciary duties as directors after the Gantler ruling in 2009, their respective liability exposure tends to be higher than that of directors. This is because the business judgment rule that protects directors generally does *not* apply to executives in Delaware even after the Gantler ruling (Johnson and Garvis, 2009; Follett, 2010). For example, in *FDIC v. Perry* in 2012, the Federal Deposit Insurance Corporation (FDIC) sued Indymac's CEO Matthew Perry for breaches of fiduciary duties by negligently authorizing the production of a loan pool that resulted in \$600 million loss to the bank. A U.S. district court refused

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<sup>5</sup> One reason is that unlike securities class actions that target disclosure and reporting related violations of securities law, derivative suits can target a wider range of breaches of fiduciary duties (e.g., misreporting, oversight failures).

to grant Perry a motion to dismiss the suit on ground that the business judgement rule *does not* apply to executives (Aviram, 2013). In the aftermath of the 2008 financial crisis, investors and stakeholders had also sued directors and executives of some financial companies for negligence in risk management or oversight failure in order to recover the losses they suffered. By July 2011, the FDIC had sued former directors and executives of nine failed banks (LaCroix, 2011).

To summarize, effort exerted by executives can reduce workplace injury rates, which should benefit shareholders, but is privately costly for executives. Enhanced legal accountability after the Gantler ruling raises the cost of shirking for executives, and encourages exertion of effort to reduce workplace injury rate. Specifically, executives may become more vigilant in identifying critical areas that pose threats to the health and safety of employees, enforce safety procedures more vigorously, and report weaknesses in operational procedures and internal controls to the board of directors in a more comprehensive and timely manner. Managerial behavioral change to mitigate liability for breaching fiduciary duties would affect corporate resources allocation, and thereby result in more investment in workplace safety.<sup>6</sup> As a result, a firm's workplace safety risk management is likely to be more effective, resulting in fewer employee injuries in the workplace after the Gantler ruling.

Nevertheless, shareholder derivative litigation or securities class actions do not have to prevail ex post in order to exert an ex-ante deterrence effect on executives. This is because lawsuits often involve significant uncertainties and can take years to conclude; they not only distract managerial attention, increase anxiety for executives, but also damage their professional reputations and career prospects (Fich and Shivdasani, 2007; Erickson, 2010).

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<sup>6</sup> Company may also be willing to respond to the higher derivative litigation risk that non-director officers face after the Gantler ruling because derivative suits do impose significant costs on the company concerned though such lawsuits target company directors and officers. The costs imposed on the company include legal costs in relation to the derivative suit, future higher insurance premium (see Vardy and Lynn (2023) for an introduction) as well as the potential negative signal sent to investors on the quality of management and/or board oversight. Consistent with this view, Badawi and Chen (2017) report that a sample of 76 Delaware derivative suits (that were first-filed in Delaware and did not involve a previous government investigation) produce a significant negative market reaction with an average five-day cumulative abnormal return being -1.1%.

We also note that there are several countervailing factors that go against us finding a significant effect of the Gantler ruling on workplace safety in Delaware incorporated firms. First, to the extent that most key executives with a risk management responsibility have already served on the board or have believed that they owe fiduciary duties to shareholders before the Gantler ruling, we are less likely to observe an improvement in workplace safety after the Gantler ruling. Second, even before the Gantler ruling, risk executives are likely subject to demotion if their behavior constitutes a dereliction of duty. Third, Delaware courts are leaders in corporate law and many states model their corporate laws on the precedents set by Delaware. The potential for the Gantler ruling to be followed by courts in other states may reduce our ability to identify a significant improvement in workplace safety within Delaware-incorporated firms. Overall, the impact of executive fiduciary duties on workplace safety is an empirical issue.

### **3. Research Design, Sample Selection, and Summary Statistics**

#### *3.1. Data and sample selection*

The Delaware Supreme Court's final ruling of the Gantler case on January 27, 2009 affects Delaware-incorporated firms (hereafter "DE firms") with non-board-serving executives. In addition to CEO, there are some key executives at the C-suite level who also have responsibility for a firm's risk management, for example, chief risk officer (CRO) or equivalent, chief compliance officer (CCO), chief legal officer (CLO), and chief financial officer (CFO). Since it is very likely that each DE firm may have one or more of the C-suite executives not serving on the board, each DE firm is under treatment by the Gantler ruling to some extent. Given this, we treat DE firms as the treatment firms, and non-Delaware-incorporated firms as the control firms in our main analysis. In the extension test, we also develop a triple-differences test that focuses on DE firms most affected by the Gantler ruling (i.e., firms without any key executives who have certain responsibility for risk management serving on the board before the ruling).

Our main outcome variables are obtained from the OSHA Initiative (ODI), which collects work-related injury data in establishments from employers till 2011. We manually match the establishment names in the ODI data first with Compustat company names and then with the subsidiary names in the WRDS Company Subsidiary database to obtain firm-level identifier in the same year. Since the injury cases and several related data items (seasonal work, strike/lockdown, shutdown/layoff, and natural disaster) are all provided at the establishment level, we follow the standard analytical approach in the workplace safety literature (e.g., Caskey and Ozel, 2017; Chen et al., 2023; Liang et al., 2023) and conduct the analysis at the establishment level to make full use of the granular variation in data and to maximize the precision of the tests.

Following Caskey and Ozel (2017) and Liang et al. (2023), we use two employee safety measures - *Injuries/Hours* and *DART Injuries/Hours* (*DART* is the terminology of the OSHA ODI data website). *Injuries/Hours* is the total number of work injury cases divided by the number of hours worked by all employees in an establishment in a given year, then multiplied by 200,000. The multiplier 200,000 represents the annual working hours of 100 full-time employees ( $100 \times 40$  hours per week  $\times 50$  weeks per year). *DART Injuries/Hours* is the number of severe work injury cases that result in at least one day away from work, restricted job activities, or job transfer, divided by the number of hours worked by all employees in an establishment in a given year, then multiplied by 200,000. While the scaling in computing these two incidence rates is recommended by the OSHA website, we also use alternative scaling (by the number of employees in an establishment in a year) in robustness checks, and find our results are robust.

To allow for the examination of the parallel trend before the 2009 Gantler ruling, we start the sample period from 2006, which is three years before the Gantler ruling, and end it in 2011 due to the unavailability of the ODI data set after 2011. We exclude utility (SIC code 4900 to 4999) and financial (SIC code 6000 to 6999) firms from the analysis. We also exclude establishments in firms without historical incorporation state information, and firms that reincorporated into, and out of,

Delaware during the period of analysis.<sup>7</sup> Finally, we drop the corresponding establishments if the aggregated number of employees in all establishments of a firm exceeds the total number of firm employees reported in Compustat as this likely reflects a data error.

To mitigate the possibility that differences in establishment characteristics between treatment and control establishments may affect employee injury rate in different ways, we perform a propensity score matching (PSM) at the establishment level in the same two-digit SIC industry in the year before the Gantler ruling. Our treatment establishments are the ones that belong to firms incorporated in Delaware in 2008. Our control establishments are establishments from the same two-digit SIC industry and belong to firms not incorporated in Delaware with the nearest propensity score in 2008.

### 3.2 Summary statistics

The summary statistics of the two dependent variables (*Injuries/Hours* and *DART Injuries/Hours*) and establishment-level and firm-level control variables used in the regression are reported in Table 1. To mitigate the influence of outliers, we winsorize a continuous variable at the 1<sup>st</sup> and 99<sup>th</sup> percentiles of its distribution. The mean of our main dependent variables *Injuries/Hours* and *DART Injuries/Hours* is about 8.113 and 5.849 for 100 employees working full time (i.e., 50 weeks \* 40 hours = 2,000 hours) in a year, respectively. These statistics are comparable to the statistics reported in previous literature (e.g., Caskey and Ozel, 2017; Liang et al., 2023).

[Insert Table 1 about Here]

### 3.3. Model specification

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<sup>7</sup> Only three firms switched incorporation state in our sample period, and our results are similar when we include these reincorporated firms in the analysis.



To test the effects of the 2009 Gantler ruling on an establishment’s workplace safety, we conduct the following difference-in-differences model:

$$Y_{i,j,t} = \beta_0 + \beta_1 DE_j \times Post_t + \delta' X_{i,j,t-1} + \alpha_i + \mu_t + \varepsilon_{i,j,t} \quad (1)$$

In Equation (1), subscripts  $i$  indexes establishment  $i$ ,  $j$  indexes firm  $j$  and  $t$  indexes year  $t$ .  $\alpha_i$  are establishment fixed effects included to control for unobserved time-invariant establishment-specific factors.  $\mu_t$  are year fixed effects to control for any time-related factors.  $Y_{i,j,t}$  is one of the two workplace injury measures *Injuries/Hours* <sub>$i,j,t$</sub>  or *DART Injuries/Hours* <sub>$i,j,t$</sub> .  $DE$  is a dummy variable that equals one for establishments belonging to a firm incorporated in Delaware and zero for otherwise.  $Post$  is a dummy variable that equals one for years from 2009 onward (the year of the Gantler ruling) and zero for otherwise. The inclusion of establishment fixed effects absorbs the standalone item of  $DE$ , while year fixed effects absorb  $Post$ , and therefore,  $DE$  and  $Post$  do not appear in the model. Delaware-incorporated firms are defined using a firm’s historical state of incorporation crawled by Prof. Bill McDonald from the EDGAR header files of company filings (by contrast, Compustat only provides a firm’s current state of incorporation).

The coefficient of interest is  $\beta_1$ , which reflects the change in workplace injuries of establishments of DE firms after the Gantler ruling relative to that of control establishments. If owing fiduciary duties to shareholders enables executives to be more vigilant in the identification and management of the workplace injury risk in day-to-day operations, we expect  $\beta_1$  to be negative and statistically significant. In Equation (1), standard errors are corrected for clustering at the incorporation-state level to account for correlations in residuals among establishments of DE firms that are affected by the Gantler ruling.

Following Caskey and Ozel (2017), we include a set of establishment and firm control variables  $X_{i,t-1}$  to capture the effects of other variables on employees’ injury rates. The establishment-level control variables include *Seasonal*, *Strike*, *Shutdown*, *Natural Disaster*, *LnEstablishment\_Size* and *Hours per Employee*. *Seasonal*, *Strike*, *Shutdown* and *Natural Disaster*

are indicator variables to capture some unusual situations and they equal one if an establishment employs seasonal workers, experiences a strike, has a shutdown, or is affected by at least a natural disaster in a year, respectively. *LnEstablishment\_Size* is the logged total number of employees in an establishment in a given year. *Hours per Employee* is the average number of working hours per employee for an establishment in a given year. Longer working hours may be associated with more injuries if fatigue arises or negatively associated with injuries if longer working hours enable employees to be more experienced (Caskey and Ozel, 2017). Firm-level control variables include firm size (*LnAT*), leverage ratio (*Lev*), market-to-book ratio (*M/B*), the logged number of operating segments (*LnOper\_Segments*), and annual capital expenditure scaled by assets (*Capex*) in our regression. Firm size measures the scale of operation, leverage and market-to-book ratio measure the potential effects of firms' financial conditions, and the latter two variables (the number of operating segments and capital expenditure) measure the effects of operation complexity on workplace injuries. Larger and more complex operations may be associated with more employee injuries. Variable definitions are provided in Appendix A1.

### 3.4. Propensity score matching

Before conducting the DID analysis, we perform a propensity score matching. We estimate the following Probit model at the establishment level in the year before the Gantler ruling to estimate propensity scores.

$$Pr (DE_j = 1 | X'_i) = \Phi(\alpha_0 + \alpha_1 X'_i + \varepsilon_i) \quad (2)$$

$DE_j$  equals one for the establishment that belongs to firm  $j$  incorporated in Delaware in the year before the Gantler ruling,  $X'_i$  refers to the following establishment-level controls, *Seasonal*, *Strike*, *Shutdown*, *Natural Disaster*, *LnEstablishment\_Size*, *Hours per Employee*, and the annual growth rates in *Injuries/Hours* and *DART Injuries/Hours*. In the spirit of Fang, Tian, and Tice (2014) and Guan et al. (2021), we match on annual growth rates in the dependent variable (i.e.,

workplace injuries) to achieve the parallel trend between the treatment and control groups in the period before the Gantler ruling.

For each treatment establishment, we select an establishment that belongs to a non-DE firm but operates in the *same* two-digit SIC industry and has the nearest propensity score as the matched control establishment. We allow replacement of control establishments and use a caliper of 0.1 to ensure the quality of the matching. Table 2 Panel A reports the Probit estimation results in the year before the Grantler ruling. Column (1) shows the results before matching, and Column (2) presents the results after matching.

The coefficient on the growth rates of *Injuries/Hours* is statistically significant in the unmatched sample in the year before the Gantler ruling, but becomes insignificant after matching. The coefficients of other establishment-level covariates are all statistically insignificant after matching as can be seen in Column (2) of Table 2 Panel A. We also compare the means of all the establishment-level covariates and firm-level characteristics between the treatment group and matched control group in Table 2 Panel B after matching and find that they are balanced between the two groups in the year before the Gantler ruling.

[Insert Table 2 about Here]

## 4. Empirical Results

### 4.1. Baseline results: The effect of the Gantler ruling on workplace safety

We estimate Equation (1) and test how establishments' employee safety changes after the Gantler ruling. Table 3 reports the DID results at the establishment level using the matched sample. We cluster standard errors at the incorporation state level. The dependent variable is *Injuries/Hours* in Columns (1)-(2), and *DART Injuries/Hours* in Columns (3)-(4).<sup>8</sup>

[Insert Table 3 about Here]

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<sup>8</sup> The sample size of the regressions is smaller than that is reported in Table 1 because about 1% of observations are dropped as singleton observations by the regressions.

All the coefficients for  $DE \times Post$  are negative and statistically significant and at the 5% level or better. In terms of the economic magnitude, the coefficient for  $DE \times Post$  in Columns (2) and (4) suggests that, after the Gantler ruling, the injury rate in DE firms' establishments on average decreases by 0.636 and 0.615 compared to the control group, which corresponds to a decrease of 7.84% relative to the mean of the injury rates (8.113) and a decrease of 10.51% relative to the mean of the severe injury rates (5.849). These magnitudes are economically meaningful. The DID results are consistent with the notion that imposing fiduciary duties on non-director executives leads them to be more vigilant in firms' workplace safety management. In addition, the results on control variables are consistent with larger operations (proxied by  $LnAT$ ) being associated with more employee injuries. In addition, there is some evidence that firms with a poor financial position (a higher leverage ratio) tend to have more workplace injuries, and these results are consistent with Cohn and Wardlaw (2016). The baseline results remain when we aggregate the workplace injuries into the firm-level injuries, and the results are reported in Appendix A2.

Taken together, our baseline findings suggest that workplace safety improves after non-board-serving executives are required to owe fiduciary duties to shareholders by the Gantler ruling.

#### 4.2. Dynamic results: Verifying the parallel trend assumption

To interpret the above results as the causal effect of the Gantler ruling, the parallel trend assumption underlying the DID analysis needs to be satisfied. We conduct a dynamic DID analysis specified in Equation (3) below. This analysis helps ascertain whether the observed divergence in the workplace safety between treatment establishments and control establishments reflects a pre-existing trend prior to the Gantler ruling.

$$Y_{i,j,t} = \beta_0 + \beta_1 DE_j \times Before(-2) + \beta_2 DE_j \times Before(-1) + \beta_3 DE_j \times After(0) + \beta_4 DE_j \times After(1) + \beta_5 DE_j \times After(2) + \delta' X_{i,j,t-1} + \alpha_i + \mu_t + \varepsilon_{i,j,t} \quad (3)$$

In Equation (3),  $Y_{i,j,t}$  is one of the two workplace injury measures  $Injuries/Hours_{i,j,t}$  or  $DART Injuries/Hours_{i,j,t}$ . The notations have the same meaning as those in Equation (1) except for time-related dummy variables. *Before (-2)*, *Before (-1)* equals one for the year that is two years and one year before the Gantler ruling, respectively. *After (0)*, *After (1)*, *After (2)* equals one for the ruling year, one year and two years after the ruling year, respectively. In this specification, year = -3 is omitted from the model as the reference group. Other control variables are identical to those in Equation (1). The parallel trend assumption is deemed to be satisfied if the coefficients on the interactions involving the years before the ruling are all insignificant.

The results show that the coefficients on  $DE_j \times Before(-2)$  and  $DE_j \times Before(-1)$  are not statistically significant in any column in Table 4. Therefore, there is no evidence indicating a violation of the parallel trend assumption. In addition, the coefficients on  $DE_j \times After(0)$  are insignificant, while the coefficients on  $DE_j \times After(1)$  and  $DE_j \times After(2)$  are negative and significant in all columns. It seems that the improvement takes about one year to show up and does not appear to be transitory as evidenced by the similar and statistically significant coefficients on  $DE_j \times After(2)$ .

[Insert Table 4 about Here]

#### 4.3. Robustness checks

In this section, we perform a robustness check for our main finding by using alternative calculation of injury rates. Cohn et al. (2021) scale the total number of injury cases by the number of employees in an establishment in a year. As such, we check the sensitivity of our results to using the two injury measures that Cohn et al. (2021) use.  $Injuries/Employees$  is the total number of work injury cases divided by the number of employees in an establishment in a given year, and it therefore represents the average number of injury cases per employee in an establishment in a year.  $DART Injuries/Employees$  is the number of severe work injury cases that result in days away from

work, restricted job activities, or job transfer, divided by the number of employees in an establishment in a year. Table 5 shows that our results continue to hold under the alternative calculation of injury rates.

[Insert Table 5 about Here]

We also consider an alternative explanation for our baseline findings. Since the Gantler ruling was delivered around the time of the 2008 financial crisis, a concern is that our results may be driven by the differential impacts of the financial crisis on Delaware-incorporated versus non-Delaware-incorporated firms. In Appendix A3, using data from 2006 to 2011 (the period for our previous baseline analysis), we show that the change in ROA, annual stock returns, or employment growth rates of Delaware-incorporated firms around the 2008 financial crisis does not significantly differ from the performance change in non-Delaware-incorporated firms. Therefore, our observed reduction in workplace injuries is unlikely due to the alternative explanation that firms incorporated in Delaware weather the financial crisis better than firms incorporated in other states.

#### *4.4. An alternative measure of workplace safety obtained from a different data source*

While the ODI data provide a direct and fine measure of workplace injuries, a limitation is that the data end in 2011, which means that we only have two years in the post-Gantler-ruling period. To ascertain whether our results are specific to the ODI workplace injury data or not, we resort to the MSCI ESG-KLD rating data as an alternative measure of employee safety for a longer period of time. Rather than directly providing employee injury rates in a workplace, the KLD database provides qualitative rating scores on environmental, social, and governance performance of companies. The KLD data provides positive (strengths) and negative (concerns) rating scores across seven categories. We only focus on the negative rating scores (concerns) under the employee relations category, and measure the dependent variable as the indicator of Health and

Safety Concern (EMP-con-B), which is directly related to employee safety and also consistently available from KLD in our period of analysis.

According to the MSCI ESG-KLD rating data, *Employee health and safety concern* equals one if a firm has been recently penalized or fined for violating employee health and safety standards on purpose, or involved in major health and safety controversies. We use a longer post-event window in the tests from 2006 to 2014 with five years after the Gantler ruling. As the dependent variable is a firm-level variable, we conduct the analysis on the parent firms of the matched treatment and control establishments in our main analysis, and include firm and year fixed effects in the linear probability model.<sup>9</sup>

Columns (1) and (2) of Table 6 report the baseline regression results and Column (3) of Table 6 reports the dynamic DiD analysis results. *Before (-2)*, *Before (-1)* equals one for the year that is two years and one year before the Gantler ruling, respectively. *After (0)*, *After (1)*, *After (2)*, *After (3)*, *After (4)*, *After (5)* equals one for the ruling year, one year, two, three, four and five years after the ruling year, respectively. The dummy for year = -3 is omitted from the model as the reference group. The results show a significant reduction in employee health and safety concern in Delaware-incorporated firms after the Gantler ruling, and the negative effect last for four years after the ruling. Overall, the evidence obtained from using a different data source (i.e., the MSCI ESG-KLD rating data) corroborates the results from analyzing the ODI injury data and is therefore assuring.

[Insert Table 6 about Here]

In addition, as the KLD data set has a longer time series. We repeat the DiD analysis by excluding the years affected by the 2008 financial crisis, for example, years 2008 - 2010. Appendix

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<sup>9</sup> The mean of *Employee health and safety concern* is 0.241 in the full sample, and is 0.246 and 0.230 within the treatment and control firms, respectively. Considering that the *Employee health and safety concern* indicator in the KLD database has many zeroes, we also conduct a Rare Events Logistic Regression (Relogit) analysis (<http://gking.harvard.edu/relogit>), and find our results remain similar. In performing the Rare Events Logistic Regression, we include *DE* and industry fixed effects but omit firm fixed effects from the estimation since including a large number of firm fixed effects in a logit model would result in the incidental parameters problem and lead to a biased estimate (Wooldridge, 2010).

A4 reports these results. We continue to observe a reduction in workplace injuries after the Gantler ruling, and this further helps mitigate the concern that our main finding is due to the differential effects of the 2008 financial crisis on Delaware-incorporated firms and firms incorporated elsewhere.

#### *4.5. The effect of the Gantler ruling on workplace safety in most affected DE firms*

Our baseline analysis treats all Delaware firms as treated, regardless of whether their risk executives serve on the board or not. Intuitively, the Gantler ruling should have the most significant effect on Delaware firms where all risk executives do not serve on the board.

To test this idea, we define a dummy variable that equals one if none of a firm's C-suite executives who have certain responsibility for risk management (i.e., chief risk officer (CRO) or equivalent (e.g., vice president of risk), chief compliance officer (CCO), chief legal officer (CLO), and chief financial officer (CFO)) or their equivalents serve on the board of directors in the year before the Gantler ruling. We focus on these positions because CRO is the person who is in charge of, and coordinates, a firm's risk management under the system of enterprise risk management (ERM). In firms that do not have a CRO, the CFO is responsible for the risk management in the organization 80% of the time according to a Deloitte survey (Deloitte, 2013). CCO is a position that emerged around 2000 and oversees regulatory compliance of laws and rules including workplace safety regulations. A CLO has similar functions and responsibilities. While CEOs also have responsibility for risk management, they are invariably members of the board of directors in our sample and so are not directly affected by Gantler ruling.

We compare the names of executives in the Execucomp database with the names of directors in the ISS Director database (formerly RiskMetrics) in each firm-year to ascertain whether an executive sits on the board of directors or not. *None of risk executives (REs) serving on board*



measures a Delaware firm's exposure to the Gantler ruling.<sup>10</sup> We then implement the following triple-differences analysis:

$$Y_{i,j,t} = \beta_0 + \beta_1 \text{None of REs serving on board}_j \times \text{DE}_j \times \text{Post}_t + \beta_2 \text{None of REs serving on board}_j \times \text{Post}_t + \beta_3 \text{DE}_j \times \text{Post}_t + \delta' X_{i,j,t-1} + \alpha_i + \mu_t + \varepsilon_{i,j,t} \quad (4)$$

In Equation (4), subscripts  $i$  indexes establishment  $i$ ,  $j$  indexes firm  $j$ , and  $t$  indexes year  $t$ .  $Y_{i,j,t}$  is one of the two workplace injury measures *Injuries/Hours* $_{i,j,t}$  or *DART Injuries/Hours* $_{i,j,t}$ . *None of REs serving on board* is a dummy variable that equals one if none of the C-suite executives who have certain responsibility for risk management (CRO or equivalent, CFO, CCO, and CLO) serve on the board of a firm in the year before the Gantler ruling. Other variables are identical to those used in Equation (1).

This triple-difference analysis not only compares the change in workplace safety around the Gantler ruling between DE firms and non-DE firms but also compares the changes in workplace safety of DE firms with at least one and without any risk executive serving on the board. The main coefficient of interest is  $\beta_1$ , which reflects the triple-differences estimate of the change in workplace injuries for DE firms without board-serving executives bearing the responsibility of risk management around the Gantler ruling relative to control firms. If owing fiduciary duties to shareholders enables non-board-serving executives to be more vigilant in risk management, we expect  $\beta_1$  to be negative and statistically significant.  $\beta_2$  captures the change in workplace injuries for non-DE firms without any board-serving risk executives around the Gantler ruling, and this coefficient, if significant, captures the spillover effect of the Gantler ruling from Delaware to other states.  $\beta_3$  captures the change in workplace injuries for DE firms who has at least one risk executive serving on the board of directors in the year before the Gantler ruling. We cluster standard errors at the level of state of incorporation to account for within-state correlations among firms.

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<sup>10</sup> In our matched sample, around 85% firms do not have any risk-management-related executives serving on the board in 2008. The mean of *None of REs serving on board* is 0.865 in treatment firms, and 0.816 in control firms, and there is no statistically significant difference in the mean of this variable between treatment and control firms.

The triple-differences results are reported in Table 7. The sample is limited to the firms covered by the Execucomp database and the sample size therefore drops by about 13% than the size of the sample used in the baseline analysis. Columns (1) and (2) show the results on *Injuries/Hours*, and Columns (3) and (4) display the results on *DART Injuries/Hours*. The triple-differences coefficient estimates ( $\beta_1$ ) are negative and statistically significant in all model specifications but stronger for more severe injuries in Columns (3) and (4). The results show that Delaware firms without any risk executive serving on the board experience a larger decrease in workplace employee injuries after the Gantler ruling, which is consistent with our baseline finding.  $\beta_3$  is not statistically significant, implying that for DE firms with at least one risk executive serving on the board of directors, there is no significant change in workplace injuries around the Gantler ruling. This suggests that one risk executive (plus the CEO) may have adequately captured the major risk management responsibilities in our sample firms.  $\beta_2$  is not statistically significant and therefore there is no evidence of a significant spillover effect of the Gantler ruling from Delaware to other states on workplace safety in our short window of analysis.

[Insert Table 7 about Here]

Furthermore, we investigate the effect of the Gantler ruling on workplace injuries conditional on the power of risk executives not serving on the board. We exclude firms whose all risk executives serve on the board from this analysis as they are not subject to the impact of the Gantler ruling. Following Ellul and Yerramilli (2013), we proxy the power of a risk executive by the ratio of his/her annual total compensation to that of the CEO in the year before the Gantler ruling. Total compensation is the sum of salary, bonus, fair value of the new restricted stock and option grants, long-term incentive payouts, and all others. We determine which risk executive to look at in the power assessment according to the following order: we use the compensation of the CRO if a firm has a CRO not serving on the board; if not, we use the maximum of the total

compensation of the CLO, CCO, and CFO who is not serving on the board; if a firm has no executive titles of CRO, CLO, CCO, or CFO, we proxy the power of the risk executive by the total compensation of the fifth highest-paid executive divided by the CEO's compensation minus 1% (see Ellul and Yerramilli (2013)). Admittedly, subtracting 1% is arbitrary but it is intended to capture the fact that when a risk executive does not appear in the top-five highest paid executive list, his/her compensation is lower than that of the fifth highest paid executive.

We define a *High-power RE not serving on board* indicator variable that equals one if the power of the risk executive (RE) who is not serving on the board in a firm is above the sample median of the power of risk executives who are not serving on the board in the year before the Gantler ruling, and zero otherwise. We incorporate the triple interaction of *High-power RE not serving on board*, *Post* and *DE*, together with the interaction of *High-power RE not serving on board* and *Post*, *Post* and *DE* into the OLS regression. The coefficient of *High-power RE not serving on boards*×*Post*×*DE* ( $\beta_1$ ) reflects the triple-differences estimate of the change in workplace injuries for DE firms whose not-serving-on-board risk executives possess greater power around the Gantler ruling relative to control firms. If owing fiduciary duties to shareholders enables non-board-serving risk executives to be more vigilant in risk management, this effect should be more pronounced when the risk executive possesses greater power. Thus, we expect  $\beta_1$  to be negative and statistically significant. We cluster standard errors at the level of state of incorporation to account for within-state correlations among firms.

Table 8 reports this triple-differences results. The sample is limited to the firms covered by the Execucomp database and firms that have at least a risk executive not serving on the board. Columns (1) and (2) show the results on *Injuries/Hours*, and Columns (3) and (4) display the results on *DART Injuries/Hours*. The triple-differences coefficient estimates ( $\beta_1$ ) are negative and statistically significant in all the model specifications. The results show that when Delaware firms'

not-board-serving risk executives command greater power, the firms experience a larger decrease in workplace employee injuries after the Gantler ruling, which extends our findings in Table 7.

[Insert Table 8 about Here]

#### 4.6. *The spillover of the Gantler ruling to non-Delaware states*

In our previous analysis, we regard DE-incorporated firms as treatment firms, and matched non-DE firms as control firms. In this section, we also try using *None of risk executives serving on board* as the treatment indicator in partitioning firms into treatment firms and control firms: i.e., firms incorporated in Delaware or other states with *None of risk executives serving on board* = 1 are treatment firms, and other firms are control firms. We then repeat the DiD analysis in our baseline sample and report the results in Appendix A5.

We find the DiD coefficient on *None of risk executives serving on board*  $\times$  *Post* is significantly negative in Columns (1) and (2), pointing to the effect of the Gantler ruling on imposing fiduciary duties on company executives and therefore reducing workplace injuries. However, this negative effect disappears if we only use firms incorporated in states other than Delaware, as reported in Columns (3) and (4) of Appendix A5. This evidence further confirms that the reduction in injury rates shown in Appendix A5 is driven by DE firms and the evidence also corroborates the insignificant  $\beta_2$  that we show in Table 7. Therefore, there is no significant spillover of the Gantler ruling to non-Delaware states in our short window of analysis.

#### 4.7. *Heterogeneity in the effects of the Gantler ruling on workplace safety*

In this section, we conduct two cross-sectional tests to show the heterogeneity in the effects of the Gantler ruling on workplace safety.

##### 4.7.1. *The moderating role of enterprise risk management (ERM)*

To begin with, we examine how the existence of ERM moderates the impact of executive fiduciary duties on workplace injuries. Ex ante, the moderating effect of ERM is not clear-cut and may depend on a firm's efficacy of ERM. On the one hand, ERM, in principle, requires a firm to manage risk at the organization level (rather than at the department or division level) with a holistic view on all key risk aspects and under a unified framework to economize the cost of risk management. ERM adopters often set up a position (e.g., CRO) to coordinate the organization's risk management. On the one hand, if a firm has adopted ERM before the Gantler ruling and if ERM has functioned effectively, it may have already managed workplace injury risk well. It follows that the incremental benefit of enhancing non-director executives' fiduciary duties by the Gantler ruling to lower workplace injuries is lower for such firms. On the other hand, if having ERM merely means that a firm has the risk management infrastructure in place (e.g., a CRO and a formal risk management policy statement) but ERM is not strictly enforced by executives in the business operation and risk management process (Brodeur, Buehler, Patsalos-Fox, and Pergler, 2010), the Gantler ruling that enhances non-director executives' fiduciary duties could strengthen the enforcement of ERM. This implies a complementary relation between ERM and executive liability: the effect of the Gantler ruling on lowering workplace injuries is more pronounced in firms that have the ERM infrastructure in place before the Gantler ruling.

To explore the moderating role of ERM on the effect of the Gantler ruling on workplace injuries. We first obtain ERM data for the Standard and Poor's (S&P) 500 firms in our sample from Neel and Xu (2021); for non-S&P500 firms, we then search in proxy statements and 10-Ks to manually collect the information on whether a firm has adopted ERM by the end of 2008. The keywords we used resemble those used in Berry-Stölzle and Xu (2018) and Neel and Xu (2021), and include "enterprise risk management," "ERM," "chief risk officer," "CRO," "risk committee," "strategic risk management," "consolidated risk management," "holistic risk management," and "integrated risk management" and their variants. For each search hit, we read the corresponding

paragraph and determine whether it is a correct hit indicating that a firm has adopted ERM. We then define the dummy variable  $ERM$  that equals one if a firm has adopted ERM as of the end of the year before the Gantler ruling, and zero otherwise. We augment Equation (1) with two interaction terms  $ERM \times DE \times Post$  and  $ERM \times Post$ . Table 9 presents the triple-differences regression results.

First, we note that the coefficients on  $DE \times Post$  ( $\beta_3$ ) are all negative and statistically significant at the 1% level in both columns, suggesting that Delaware-incorporated firms that have not adopted ERM before the Gantler ruling experience a significant reduction in workplace injuries after the Gantler ruling. Second, the coefficients on  $ERM \times DE \times Post$  ( $\beta_1$ ) are also negative and statistically significant in both columns, suggesting that the effect of Gantler ruling on reducing workplace injuries is stronger for Delaware-incorporated firms that have ERM before the ruling. The result is consistent with a complementary relation between ERM and the effects of the Gantler ruling on reducing workplace injuries, and suggests that the fiduciary duties established by the Gantler ruling incentivize non-director executives to better utilize the ERM infrastructure in place and enforce existing risk management procedures, leading to a larger improvement in workplace safety. The combination of  $(\beta_1 + \beta_3)$  and its statistical significance (tested with a Wald test) are reported at the bottom of the table.

[Insert Table 9 about Here]

#### 4.7.2. *The moderating effects of firms' financial constraints*

Next, we examine how a firm's financial constraints moderate the impact of fiduciary duties of non-board-serving executives on workplace injuries. To reduce workplace injuries, a firm needs to spend on employee safety training, buying protective consumables, and making loss control investments. Firms subject to financial constraints are often unable to afford such spending on workplace safety or need to prioritize other spending items (Cohn and Wardlaw, 2016). Consistent

with this, Filer and Golbe (2003) find that firms with a higher profit margin have safer workplaces. Therefore, we expect the impact of the Gantler ruling on reducing workplace injuries to be more pronounced in the firms that are less financially constrained before the ruling.

We use the KZ index and WW index as measures of financial constraints. We construct a dummy variable, *Low Constraint*, which equals one if the WW (KZ) index of an establishment's parent firm is below the sample median in the year before the Gantler ruling, and zero otherwise. We augment Equation (1) with two interaction terms *Low Constraint*  $\times$  *DE*  $\times$  *Post* and *Low Constraint*  $\times$  *Post*. The regression results are presented in Table 10.

The coefficients on the triple interaction term are negative and statistically significant in all columns. These findings are consistent with the argument that the effect of the Gantler ruling on improvements in workplace safety is concentrated in financially unconstrained firms, which can also be seen from the negative and statistically significant combined coefficient of  $(\beta_1 + \beta_3)$  reported near the bottom of the table.

[Insert Table 10 about Here]

## 5. Conclusion

There is no evidence on whether enhanced accountability of non-director executives improves firms' operational risk management. We shed light on this research question by using workplace safety as a lens and exploiting Delaware Supreme Court's Gantler ruling in 2009 as a plausibly exogenous shock to the accountability of non-board-serving executives. While the vigilance of corporate executives is critical to a firm's risk management and success, it has been a murky and debated area whether non-board-serving executives owe fiduciary duties to shareholders as company directors do. The Gantler ruling explicitly established such fiduciary duties of non-board-serving executives in Delaware-incorporated firms.

Our difference-in-differences analysis shows that the occurrence of workplace injuries decreases in establishments of Delaware-incorporated firms after the Gantler ruling relative to matched establishments of non-Delaware-incorporated firms. This effect is more pronounced in Delaware-incorporated firms where all risk executives do not serve on the board, firms where non-board-serving risk executives hold greater power. The decrease in workplace injuries is stronger in firms that have adopted enterprise risk management, but is attenuated by the existence of financial constraints before the Gantler ruling. Our study also adds to the limited research on the efficacy of corporate operational risk management.



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**Table 1. Summary statistics**

This table reports the summary statistics of the variables for our PSM matched sample at the establishment-year level. Our main sample starts from 2006 to 2011. We exclude utility (SIC 4900 to 4999) and financial (SIC 6000 to 6999) firms. Our main dependent variables are obtained from OSHA Data Initiative (ODI), which collected establishment-level work-related injury data from employers until 2011. *Injuries/Hours* is the total number of workplace injury cases divided by the number of hours worked by all employees in an establishment in a given year, then multiplied by 200,000. *DART Injuries/Hours* is the number of severe workplace injury cases that result in days away from work, restricted work activity, or job transfer, divided by the number of hours worked by all employees in an establishment in a given year, then multiplied by 200,000. *DE* equals one if an establishment belongs to a firm incorporated in Delaware, which is one year before the event year. *Post* equals one for years since 2009. *LnAT* is logged total asset, *LnOper\_Segments* is the log of the number of operating segments, *Capex* is capital expenditure scaled by total assets, *M/B* is the market-to-book ratio of equity, *Lev* is the long-term debt to the market value of equity ratio. Following Caskey and Ozel (2017), we include several establishment-level variables to control for establishment-specific factors that may affect employee injuries. *Seasonal*, *Strike*, *Shutdown*, *Natural Disaster* are indicator variables that equal one if an establishment employs seasonal workers, has experienced a strike, has had a shutdown/layoff, or is affected by at least a natural disaster in a given year, respectively. *LnEstablishment\_Size* is the logged total number of employees in an establishment in a given year. *Hours per Employee* is the average number of working hours per employee in an establishment in a given year.

Variables	N	Mean	Std dev	P25	Median	P75
<i>Injuries/Hours</i>	10901	8.113	6.430	2.900	7.013	11.78
<i>DART Injuries/Hours</i>	10901	5.849	5.271	1.507	4.614	8.842
<i>Post</i>	10901	0.303	0.459	0	0	1
<i>DE</i>	10901	0.766	0.423	1	1	1
<i>Seasonal</i>	10901	0.025	0.157	0	0	0
<i>Strike</i>	10901	0.003	0.058	0	0	0
<i>Shutdown</i>	10901	0.100	0.301	0	0	0
<i>Natural Disaster</i>	10901	0.004	0.066	0	0	0
<i>LnEstablishment_Size</i>	10901	5.038	1.061	4.277	4.927	5.631
<i>Hours per Employee</i>	10901	1943	342.4	1733	1998	2137
<i>LnOper_Segments</i>	10740	1.369	0.715	1.099	1.386	1.792
<i>Capex</i>	10802	0.046	0.031	0.023	0.038	0.062
<i>LnAT</i>	10805	8.854	1.772	7.495	8.933	10.31
<i>Lev</i>	10800	0.598	1.195	0.064	0.193	0.530
<i>M/B</i>	10805	2.979	3.174	1.443	2.447	4.471

**Table 2. Establishment-level PS matching**

Panel A reports the Probit regression results on variables used in propensity score (PS) matching. We perform the PSM at the establishment level in the same two-digit SIC industry in the year before the Gantler ruling. We use the following covariates in matching, *Seasonal*, *Strike*, *Shutdown*, *Natural Disaster*, *LnEstablishment\_Size*, *Hours per Employee*, *Growth Rate of Injuries/Hours* and *Growth Rate of DART Injuries/Hours*. Our treatment establishments are the ones that belong to firms incorporated in Delaware. For each treatment establishment, its matched control establishment is an establishment that operates in the same 2-digit SIC industry, belongs to firms not incorporated in Delaware, and has the nearest propensity score subject to a caliper of 0.1 and replacement to ensure the quality of matching. Column (1) reports the Probit regression results on establishment-level matching covariates before matching in the year before the event. Column (2) reports the results on establishment-level matching variables after matching in the year before the event. Panel B reports the t-tests comparison of the (average) establishment and firm characteristics in the pre-event year between treatment and control establishments after PS matching. The numbers reported in the parentheses are *t*-statistics in Panel A. \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% level, respectively.

Panel A: PS matching

<i>Y = DE</i>	Before PSM match (1)	After PSM match (2)
<i>Seasonal</i>	0.004 (0.016)	-0.100 (-0.49)
<i>Strike</i>	0.388 (0.758)	-0.014 (-0.03)
<i>Shutdown</i>	0.343 (1.365)	0.110 (0.73)
<i>Natural Disaster</i>	-0.007 (-0.019)	-0.145 (-0.37)
<i>LnEstablishment_Size</i>	0.053 (1.103)	0.025 (0.65)
<i>Hours per Employee</i>	0.000 (0.710)	-0.000 (-1.16)
<i>Growth Rate of Injuries/Hours</i>	-0.270** (-2.524)	-0.078 (-1.18)
<i>Growth Rate of DART Injuries/Hours</i>	-0.167 (-1.502)	0.023 (0.37)
Observations	4,090	3,093
Pseudo $R^2$	0.059	0.008

Panel B: Balance check after matching

Variables	Mean of Treatment establishments (1)	Mean of Control establishments (2)	<i>t</i> -stat of the mean difference (C – T) (3)
<i>Seasonal</i>	0.015	0.018	0.26
<i>Strike</i>	0.003	0.003	0.07
<i>Shutdown</i>	0.183	0.156	-0.65
<i>Natural Disaster</i>	0.004	0.005	0.55
<i>LnEstablishment_Size</i>	4.992	4.940	-0.52
<i>Hours per Employee</i>	1900	2000	1.50
<i>Growth Rate of Injuries/Hours</i>	-0.192	-0.153	0.96
<i>Growth Rate of DART Injuries/Hours</i>	-0.193	-0.168	0.55

<i>LnOper_Segments</i>	1.336	1.333	-0.02
<i>Capex</i>	0.048	0.050	0.23
<i>LnAT</i>	8.901	8.602	-0.82
<i>Lev</i>	1.791	0.769	-1.13
<i>M/B</i>	2.507	2.183	-0.45

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**Table 3. Baseline results: The effect of the Gantler ruling on workplace injuries**

This table reports the results of the difference-in-differences analysis of the effect of the Gantler ruling on workplace injuries at the establishment level using the matched sample. *Injuries/Hours* is the total number of workplace injury cases divided by the number of hours worked by all employees in an establishment in a given year, then multiplied by 200,000. *DART Injuries/Hours* is the number of severe workplace injury cases that result in days away from work, restricted work activity, or job transfer, divided by the number of hours worked by all employees in an establishment in a given year, then multiplied by 200,000. *DE* is a dummy variable that equals one if an establishment belongs to a firm incorporated in Delaware. *Post* is a dummy variable that equals one for years since 2009. Robust standard errors are clustered at the incorporation-state level. *t*-statistics are reported in parentheses. \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% level, respectively.

Y =	<i>Injuries/Hours</i>		<i>DART Injuries/Hours</i>	
	(1)	(2)	(3)	(4)
<b><i>DE × Post</i></b>	<b>-0.627**</b> <b>(-2.62)</b>	<b>-0.636**</b> <b>(-2.54)</b>	<b>-0.624***</b> <b>(-3.75)</b>	<b>-0.615***</b> <b>(-3.57)</b>
<i>Seasonal</i>	-0.652*** (-3.28)	-0.719*** (-3.37)	-0.114 (-0.65)	-0.185 (-0.99)
<i>Strike</i>	0.865*** (6.78)	0.911*** (7.16)	-0.119 (-0.51)	-0.130 (-0.53)
<i>Shutdown</i>	-0.171** (-2.35)	-0.170** (-2.55)	0.022 (0.31)	0.012 (0.19)
<i>Natural Disaster</i>	-0.497 (-1.28)	-0.450 (-1.19)	-0.148 (-0.61)	-0.160 (-0.65)
<i>LnEstablishment_Size</i>	-0.102 (-0.47)	-0.186 (-0.88)	0.443** (2.46)	0.379** (2.24)
<i>Hours per Employee</i>	0.000* (1.78)	0.000 (1.35)	0.000 (1.66)	0.000 (1.18)
<i>LnOper_Segments</i>		-0.086 (-0.45)		-0.288 (-0.87)
<i>Capex</i>		5.122 (1.55)		3.271 (0.72)
<i>LnAT</i>		0.593*** (2.97)		0.530*** (3.14)
<i>Lev</i>		0.153*** (13.03)		0.224*** (18.61)
<i>M/B</i>		-0.010 (-1.17)		-0.009 (-0.90)
Establishment FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Observations	10,786	10,597	10,786	10,597
Adjusted R <sup>2</sup>	0.627	0.629	0.616	0.620

**Table 4. Dynamic results: The effect of the Gantler ruling on workplace injuries**

This table reports the results of the dynamic DiD analysis of the effect of the Gantler ruling on workplace injuries at the establishment level using the matched sample. *Injuries/Hours* (*DART Injuries/Hours*) is the total number of (severe) workplace injury cases divided by the number of hours worked by all employees in an establishment in a given year, then multiplied by 200,000. *DE* is a dummy variable that equals one if an establishment belongs to a firm incorporated in Delaware. *Before (-2)*, *Before (-1)* are dummy variables that equals one for the year that is two years and one year before the ruling event, respectively. *After (0)*, *After (1)*, *After (2)* are dummy variables that equals one for the event year, one year and two years after the Gantler ruling event, respectively. *t*-statistics are reported in parentheses and are based on robust standard errors clustered at the incorporation-state level. \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% level, respectively.

Y =	<i>Injuries/Hours</i>		<i>DART Injuries/Hours</i>	
	(1)	(2)	(3)	(4)
<i>DE × Before (-2)</i>	0.042 (0.11)	0.094 (0.26)	-0.185 (-0.74)	-0.152 (-0.66)
<i>DE × Before (-1)</i>	-0.524 (-1.16)	-0.458 (-1.04)	-0.388 (-1.17)	-0.372 (-1.18)
<i>DE × After (0)</i>	-0.242 (-0.45)	-0.204 (-0.40)	-0.429 (-0.91)	-0.423 (-0.99)
<b><i>DE × After (1)</i></b>	<b>-1.223***</b> <b>(-3.04)</b>	<b>-1.214***</b> <b>(-3.03)</b>	<b>-1.171***</b> <b>(-4.43)</b>	<b>-1.161***</b> <b>(-4.14)</b>
<b><i>DE × After (2)</i></b>	<b>-1.122**</b> <b>(-2.21)</b>	<b>-1.025*</b> <b>(-1.94)</b>	<b>-0.962**</b> <b>(-2.25)</b>	<b>-0.836*</b> <b>(-1.78)</b>
<i>Seasonal</i>	-0.660*** (-3.27)	-0.724*** (-3.35)	-0.121 (-0.70)	-0.191 (-1.03)
<i>Strike</i>	0.845*** (6.87)	0.892*** (7.04)	-0.150 (-0.64)	-0.159 (-0.65)
<i>Shutdown</i>	-0.170** (-2.35)	-0.167** (-2.52)	0.024 (0.35)	0.017 (0.28)
<i>Natural Disaster</i>	-0.477 (-1.25)	-0.438 (-1.18)	-0.131 (-0.54)	-0.146 (-0.59)
<i>LnEstablishment_Size</i>	-0.113 (-0.53)	-0.192 (-0.92)	0.433** (2.47)	0.372** (2.22)
<i>Hours per Employee</i>	0.000* (1.78)	0.000 (1.34)	0.000 (1.65)	0.000 (1.17)
<i>LnOper_Segments</i>		-0.116 (-0.62)		-0.313 (-0.97)
<i>Capex</i>		5.348* (1.86)		3.422 (0.79)
<i>LnAT</i>		0.578*** (2.78)		0.523*** (3.14)
<i>Lev</i>		0.154*** (12.01)		0.224*** (17.21)
<i>M/B</i>		-0.009 (-1.12)		-0.008 (-0.81)
Estab & Year FE	YES	YES	YES	YES
Observations	10,786	10,597	10,786	10,597
Adjusted <i>R</i> <sup>2</sup>	0.627	0.629	0.616	0.620



**Table 5. Robustness check with alternative workplace injury measures**

This table reports the robustness of test results on the effect of the Gantler ruling on workplace injuries by using alternative injury rate calculations. *Injuries/Employees* is the total number of workplace injury cases divided by the number of employees in an establishment in a given year. *DART Injuries/Employees* is the number of severe work injury cases that result in days away from work, restricted work activity, or job transfer, divided by the number of employees in an establishment in a given year. *DE* is a dummy variable that equals one if the establishment belongs to a firm incorporated in Delaware. *Post* is a dummy variable that equals one for years since 2009. Panel A reports the baseline DiD results, and Panel B reports the dynamic DiD results. *t*-statistics are reported in parentheses and are based on robust standard errors clustered at the incorporation-state level. \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% level, respectively.

**Panel A: Alternative injury rate calculations (baseline results)**

Y =	<i>Injuries/Employees</i>	<i>DART Injuries/Employees</i>
	(1)	(2)
<b><i>DE</i> × <i>Post</i></b>	<b>-0.006**</b> (-2.30)	<b>-0.005***</b> (-3.01)
Control variables as in Table 3	YES	YES
Estab & Year FE	YES	YES
Observations	10,597	10,597
Adjusted <i>R</i> <sup>2</sup>	0.615	0.613

**Panel B: Alternative injury rate calculations (dynamic results)**

	<i>Injuries/Employees</i>	<i>DART Injuries/Employees</i>
	(1)	(2)
<i>DE</i> × <i>Before</i> (-2)	0.002 (0.45)	-0.001 (-0.29)
<i>DE</i> × <i>Before</i> (-1)	-0.003 (-0.58)	-0.002 (-0.76)
<i>DE</i> × <i>After</i> (0)	0.001 (0.26)	-0.001 (-0.22)
<b><i>DE</i> × <i>After</i> (1)</b>	<b>-0.011**</b> (-2.44)	<b>-0.011***</b> (-3.51)
<b><i>DE</i> × <i>After</i> (2)</b>	<b>-0.009*</b> (-1.73)	<b>-0.008*</b> (-1.79)
Control variables as in Table 3	YES	YES
Estab & Year FE	YES	YES
Observations	10,597	10,597
Adjusted <i>R</i> <sup>2</sup>	0.616	0.614

**Table 6. Robustness check with KLD data: The effect of the Gantler ruling on employee health and safety concern**

This table reports the results on the effect of the Gantler ruling on workplace injuries alternatively measured by the KLD indicator for health and safety concern. The analysis is at the firm level and the sample period for this test is from 2006 to 2014 using the sample of firms examined in Table 3. We estimate a linear probability model. *DE* is a dummy variable that equals one if a firm is incorporated in Delaware, and zero for otherwise. *Post* is a dummy variable that equals one for years since 2009. *t*-statistics are reported in parentheses and are based on robust standard errors clustered at the incorporation-state level. \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% level, respectively.

Y =	<i>Employee health and safety concern (0/1)</i>		
	(1)	(2)	(3)
<b><i>DE × Post</i></b>	<b>-0.075***</b> (-3.93)	<b>-0.075***</b> (-3.91)	
<i>DE × Before</i> (-2)			0.021 (0.64)
<i>DE × Before</i> (-1)			-0.007 (-0.15)
<i>DE × After</i> (0)			-0.016 (-0.35)
<b><i>DE × After</i> (1)</b>			<b>-0.092*</b> (-1.90)
<b><i>DE × After</i> (2)</b>			<b>-0.108**</b> (-2.28)
<b><i>DE × After</i> (3)</b>			<b>-0.076**</b> (-2.08)
<b><i>DE × After</i> (4)</b>			<b>-0.078*</b> (-1.95)
<b><i>DE × After</i> (5)</b>			<b>-0.062</b> (-1.50)
<i>LnOper_Segments</i>		0.018 (1.18)	0.017 (1.15)
<i>Capex</i>		0.019 (0.12)	0.031 (0.20)
<i>LnAT</i>		0.070*** (7.73)	0.070*** (7.73)
<i>Lev</i>		-0.020*** (-5.04)	-0.021*** (-4.69)
<i>M/B</i>		0.000 (0.19)	0.000 (0.30)
Firm & Year FE	YES	YES	YES
Observations	4,382	4,329	4,329
Adjusted <i>R</i> <sup>2</sup>	0.526	0.527	0.527

**Table 7. The effect of the Gantler ruling on workplace injuries: Delaware firms with none of risk executives serving on the board vs. other Delaware firms (Triple-differences analysis)**

This table reports the results of the triple-differences analysis of the effect of the Gantler ruling on workplace injuries for Delaware-incorporated firms without any director-serving risk executive and for Delaware-incorporated firms with at least one director-serving risk executive. *Injuries/Hours* is the total number of workplace injury cases divided by the number of hours worked by all employees in an establishment in a given year, then multiplied by 200,000. *DART Injuries/Hours* is the number of severe workplace injury cases that result in days away from work, restricted work activity, or job transfer, divided by the number of hours worked by all employees in an establishment in a given year, then multiplied by 200,000. *DE* is a dummy variable that equals one if the establishment belongs to a firm incorporated in Delaware. *Post* is a dummy variable that equals one for years since 2009. *None of REs serving on board* is a dummy variable that equals one if none of the risk executives (i.e., CRO, CLO, CCO, and CFO or their equivalents) serve on the board of a firm in year 2008. *t*-statistics are reported in parentheses and are based on robust standard errors clustered at the incorporation state level. \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% level, respectively.

Y =	<i>Injuries/Hours</i>		<i>DART Injuries/Hours</i>	
	(1)	(2)	(3)	(4)
<b><i>None of REs serving on board</i> × <i>DE</i> × <i>Post</i> (<math>\beta_1</math>)</b>	<b>-0.727*</b> <b>(-1.69)</b>	<b>-0.780*</b> <b>(-1.76)</b>	<b>-0.904**</b> <b>(-2.61)</b>	<b>-0.821**</b> <b>(-2.20)</b>
<i>None of REs serving on board</i> × <i>Post</i> ( $\beta_2$ )	0.019 (0.04)	0.042 (0.09)	0.096 (0.28)	0.055 (0.15)
<i>DE</i> × <i>Post</i> ( $\beta_3$ )	-0.155 (-0.41)	-0.064 (-0.17)	0.019 (0.07)	0.006 (0.02)
( $\beta_1 + \beta_3$ )	-0.882***	-0.844***	-0.885***	-0.815***
Establishment controls as in Table 3	YES	YES	YES	YES
Firm controls as in Table 3	NO	YES	NO	YES
Establishment & Year FE	YES	YES	YES	YES
Observations	9,381	9,239	9,381	9,239
Adjusted $R^2$	0.642	0.642	0.631	0.633

**Table 8. The effect of the Gantler ruling on workplace injuries: The power of risk executives not serving on the board (Triple-differences analysis)**

This table reports the results of the triple-differences analysis of the effect of the Gantler ruling on workplace injuries conditional on the power of risk executives (RE) not serving on the board. *Injuries/Hours* is the total number of workplace injury cases divided by the number of hours worked by all employees in an establishment in a given year, then multiplied by 200,000. *DART Injuries/Hours* is the number of severe workplace injury cases that result in days away from work, restricted work activity, or job transfer, divided by the number of hours worked by all employees in an establishment in a given year, then multiplied by 200,000. *DE* is a dummy variable that equals one if the establishment belongs to a firm incorporated in Delaware. *Post* is a dummy variable that equals one for years since 2009. *High-power RE not serving on board* is a dummy variable that equals one if the power of the risk executive who is not serving on the board in a firm is above the sample median of the power of risk executives who are not serving on the board in the year before the Gantler ruling, and zero otherwise. We exclude firms whose all risk executives serve on the board from this analysis as they are not subject to the impact of the Gantler ruling. Following Ellul and Yerramilli (2013), we proxy the power of a risk executive by the ratio of his/her total compensation to that of the CEO in the year before the Gantler ruling. Total compensation is the sum of salary, bonus, fair value of the new restricted stock and option grants, long-term incentive payouts, and all others. We determine which risk executive to look at in the power assessment in the following order: we use the compensation of the CRO if a firm has a CRO not serving on the board; if not, we use the maximum of the total compensation of the CLO, CCO, and CFO who is not serving on the board; if a firm has no executive titles of CRO, CLO, CCO, and CFO or their equivalents, we proxy the power of the risk executive by the total compensation of the fifth highest-paid executive divided by the CEO's compensation minus 1% (see Ellul and Yerramilli (2013)). *t*-statistics are reported in parentheses and are based on robust standard errors clustered at the incorporation state level. \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% level, respectively.

Y =	<i>Injuries/Hours</i>		<i>DART Injuries/Hours</i>	
	(1)	(2)	(3)	(4)
<i>High-power RE not serving on board</i> × <i>Post</i> × <i>DE</i> ( $\beta_1$ )	-1.353** (-2.35)	-1.338** (-2.19)	-1.441*** (-3.54)	-1.263*** (-3.05)
<i>High-power RE not serving on board</i> × <i>Post</i> ( $\beta_2$ )	0.147 (0.25)	0.114 (0.19)	0.298 (0.73)	0.186 (0.45)
<i>Post</i> × <i>DE</i> ( $\beta_3$ )	-0.179 (-0.75)	-0.153 (-0.60)	-0.129 (-0.90)	-0.140 (-0.83)
( $\beta_1 + \beta_3$ )	-1.532***	-1.491**	-1.570***	-1.403***
Establishment controls as in Table 3	YES	YES	YES	YES
Firm controls as in Table 3	NO	YES	NO	YES
Establishment & Year FE	YES	YES	YES	YES
Observations	8,530	8,395	8,530	8,395
Adjusted $R^2$	0.641	0.640	0.628	0.630

**Table 9. The effect of the Gantler ruling on workplace injuries: The moderating role of enterprise risk management (ERM)**

This table reports the results on the effect of the Gantler ruling on workplace injuries conditional on whether a firm the enterprise risk management (ERM) infrastructure in place before the Gantler ruling. *Injuries/Hours* is the total number of workplace injury cases divided by the number of hours worked by all employees in an establishment in a given year, then multiplied by 200,000. *DART Injuries/Hours* is the number of severe workplace injury cases that result in days away from work, restricted work activity, or job transfer, divided by the number of hours worked by all employees in an establishment in a given year, then multiplied by 200,000. *DE* is a dummy variable that equals one if the establishment belongs to a firm incorporated in Delaware. *Post* is a dummy variable that equals one for years since 2009. *ERM* equals one if a firm has adopted enterprise risk management as of the end of the year before the Gantler ruling, and zero otherwise. *t*-statistics are reported in parentheses and are based on robust standard errors clustered at the incorporation-state level. \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% level, respectively.

Y =	<i>Injuries/Hours</i>	<i>DART Injuries/Hours</i>
	(1)	(2)
<b><i>ERM</i> × <i>DE</i> × <i>Post</i> (<math>\beta_1</math>)</b>	<b>-1.029**</b> <b>(-2.35)</b>	<b>-1.224***</b> <b>(-4.09)</b>
<i>ERM</i> × <i>Post</i> ( $\beta_2$ )	0.186 (0.42)	0.065 (0.22)
<i>DE</i> × <i>Post</i> ( $\beta_3$ )	-0.723** (-2.64)	-0.806*** (-3.17)
$(\beta_1 + \beta_3)$	-1.751***	-2.030***
Control variables as in Table 3	YES	YES
Establishment FE	YES	YES
Year FE	YES	YES
Observations	7,060	7,060
Adjusted $R^2$	0.647	0.643

**Table 10. The effect of the Gantler ruling on employee safety: The moderating role of financial constraints**

This table reports the results of the effect of the Gantler ruling on workplace injuries conditional on a firm's financial constraints. *Injuries/Hours* is the total number of workplace injury cases divided by the number of hours worked by all employees in an establishment in a given year, then multiplied by 200,000. *DART Injuries/Hours* is the number of severe workplace injury cases that result in days away from work, restricted work activity, or job transfer, divided by the number of hours worked by all employees in an establishment in a given year, then multiplied by 200,000. *DE* is a dummy variable that equals one if an establishment belongs to a firm incorporated in Delaware. *Post* is a dummy variable that equals one for years since 2009. *WW index* is calculated according to Whited and Wu (2006), and *KZ index* is the four-variable KZ score calculated following Baker et al. (2003). *Low Constraint* is a dummy variable if an establishment's parent firm has a *WW index* (or *KZ index*) below the sample median of the financial constraint measure concerned in the year before the Gantler ruling. *t*-statistics are reported in parentheses and are based on robust standard errors clustered at the incorporation-state level. \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% level, respectively.

Y =	<i>WW index</i>		<i>KZ index</i>	
	<i>Injuries/Hours</i>	<i>DART Injuries/Hours</i>	<i>Injuries/Hours</i>	<i>DART Injuries/Hours</i>
	(1)	(2)	(3)	(4)
<b><i>Low Constraint</i> × <i>DE</i> × <i>Post</i> (<math>\beta_1</math>)</b>	<b>-1.020**</b> <b>(-2.06)</b>	<b>-0.923***</b> <b>(-2.74)</b>	<b>-1.431**</b> <b>(-2.65)</b>	<b>-0.697**</b> <b>(-2.03)</b>
<i>Low Constraint</i> × <i>Post</i> ( $\beta_2$ )	0.657 (1.35)	0.567* (1.75)	0.547 (1.02)	0.205 (0.60)
<i>DE</i> × <i>Post</i> ( $\beta_3$ )	0.081 (0.18)	0.043 (0.14)	0.144 (0.28)	-0.244 (-0.73)
$(\beta_1 + \beta_3)$	-0.939***	-0.880***	-1.287***	-0.941***
Control variables as in Table 3	YES	YES	YES	YES
Establishment FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Observations	10,556	10,556	10,517	10,517
Adjusted $R^2$	0.629	0.620	0.630	0.621

## Appendix A1. Variable definition

<b>Variable</b>	<b>Definition</b>
<u>Dependent variables</u>	
<i>Injuries/Hours</i>	The total number of workplace injury cases divided by the number of hours worked by all employees in an establishment in a given year, then multiplied by 200,000 (ODI database)
<i>DART Injuries/Hours</i>	The number of severe workplace injury cases that result in days away from work, restricted work activity, or job transfer, divided by the number of hours worked by all employees in an establishment in a given year, then multiplied by 200,000 (ODI database)
<i>Injuries/Employees</i>	The total number of workplace injury cases divided by the number of employees in an establishment in a given year (ODI database)
<i>DART Injuries/Employees</i>	The number of severe workplace injury cases that result in days away from work, restricted work activity, or job transfer, divided by the number of employees in an establishment in a given year (ODI database)
<i>Employee Health and Safety Concern</i>	An indicator that equals one if a company recently has either paid substantial fines or civil penalties for willful violations of employee health and safety standards, or has been otherwise involved in major health and safety controversies (MSCI ESG-KLD database)
<u>Independent variables</u>	
<i>Post</i>	A dummy variable that equals one from 2009 (Compustat database)
<i>DE</i>	A dummy variable that equals one if an establishment belongs to a firm incorporated in Delaware in our sample period (Bill McDonald 10-K database)
<i>None of REs serving on board</i>	A dummy variable that equals one if none of the key executives who have certain responsibility for risk management (i.e., CRO, CLO, CCO, CFO or their equivalents) serve on board of a firm in year 2008
<i>High-power RE not serving on board</i>	A dummy variable that equals one if the power of the risk executive who is not serving on the board in a firm is above the sample median of the power of risk executives who are not serving on the board in the year before the Gantler ruling, and zero otherwise. The power of a risk executive is defined as the ratio of his/her total compensation to that of the CEO in the year before the Gantler ruling. Total compensation is the sum of salary, bonus, fair value of the new restricted stock and option grants, long-term incentive payouts, and all others. We use the compensation of the CRO if a firm has a CRO not serving on the board; if not, we use the maximum of the total compensation of the CLO, CCO, and CFO who is not serving on the board; if a firm has no executive titles of CRO, CLO, CCO, and CFO or their equivalents, we proxy the power of the risk executive by the total compensation of the fifth highest-paid executive divided by the CEO's compensation minus 1% (see Ellul and Yerramilli (2013))
<u>Control variables at the establishment level</u>	

<i>Seasonal</i>	An indicator variable that equals one if an establishment employs seasonal workers in a year (ODI database)
<i>Strike</i>	An indicator variable that equals one if an establishment has experienced a strike in a year (ODI database)
<i>Shutdown</i>	An indicator variable that equals one if an establishment has experienced a shutdown in a year (ODI database)
<i>Natural Disaster</i>	An indicator variable that equals one if an establishment is affected by at least one natural disaster in a year (ODI database)
<i>LnEstablishment_Size</i>	The logged total number of employees in an establishment in a year (ODI database)
<i>Hours per Employee</i>	The total number of working hours divided by the number of employees in an establishment in a year (ODI database)

Control variables at the firm level

<i>LnOper_Segments</i>	The natural log of the number of operating segments (Compustat-Segments database)
<i>Capex</i>	Capital expenditures divided by total assets (Compustat database)
<i>LnAT</i>	The natural log of total assets (Compustat database)
<i>Lev</i>	The ratio of long-term debt to the market value of equity (Compustat database)
<i>M/B</i>	The market-to-book ratio of equity (Compustat database)

Firm level characteristics

<i>ERM</i>	Dummy variable that equals one if a firm has adopted enterprise risk management as of the end of the year before the Gantler ruling, and zero otherwise.
<i>WW index</i>	A financial constrain index constructed according to Whited and Wu (2006), measured as a weighted sum of the cash flow to total assets ratio ( <i>CF</i> ), an indicator that equals one if a firm pays cash dividends ( <i>DIVPOS</i> ), the long-term debt to total assets ratio ( <i>TLTD</i> ), the natural log of total assets ( <i>LnAT</i> ), the firm's 3-digit industry sales growth ( <i>ISG</i> ) and a firm's sales growth rate ( <i>SG</i> ): $WW = -0.091 \times CF - 0.062 \times DIVPOS + 0.021 \times TLTD - 0.044 \times LnAT + 0.102 \times ISG - 0.035 \times SG$ (Compustat database)
<i>KZ index</i>	A financial constrain index constructed according to Baker et al. (2003), measured as a weighted sum of cash flow ( <i>CF</i> ), cash dividends ( <i>DIV</i> ), and cash balances ( <i>CHE</i> ), all scaled by the beginning of year assets ( <i>AT</i> ), as well as leverage ratio ( <i>LEV</i> ): $KZA = -1.002 \times CF/AT - 39.368 \times DIV/AT - 1.315 \times CHE/AT + 3.139 \times LEV$ (Compustat database)

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## Appendix A2. The effect of the Gantler ruling on workplace injuries aggregated at the firm-level

This table reports the results of the difference-in-differences analysis of the effect of the Gantler ruling on workplace injuries at the firm level using the matched sample. The sample period is from 2006 to 2011. *Injuries/Hours* is a firm's sum of workplace injury cases divided by the number of hours worked by all employees in all establishments of the firm in a given year, then multiplied by 200,000. *DART Injuries/Hours* is a firm's sum of severe workplace injury cases divided by the number of hours worked by all employees in all establishments of the firm in a given year, then multiplied by 200,000. *Seasonal*, *Strike*, *Shutdown*, *Natural Disaster* are aggregated at the firm level in a year. *LnEstablishment\_Size* is the logged total number of employees in all establishments of the firm in a given year. *Hours per Employee* is a firm's sum of working hours divided by the total number of employees in all establishments of the firm in a given year. *DE* is a dummy variable that equals one if a firm is incorporated in Delaware, and zero for otherwise. *Post* is a dummy variable that equals one for years since 2009. Robust standard errors are clustered at the incorporation-state level. *t*-statistics are reported in parentheses. \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% level, respectively.

Y =	<i>Injuries/Hours</i>		<i>DART Injuries/Hours</i>	
	(1)	(2)	(3)	(4)
<b><i>DE × Post</i></b>	<b>-0.546**</b>	<b>-0.630**</b>	<b>-0.427**</b>	<b>-0.405**</b>
	<b>(-2.34)</b>	<b>(-2.55)</b>	<b>(-2.49)</b>	<b>(-2.31)</b>
<i>Seasonal</i>	0.052	0.085	0.289	0.311*
	(0.24)	(0.37)	(1.62)	(1.76)
<i>Strike</i>	0.145	0.113	-0.055	-0.078
	(1.46)	(1.13)	(-0.48)	(-0.66)
<i>Shutdown</i>	-0.008	-0.013	0.059	0.057
	(-0.10)	(-0.16)	(1.21)	(1.28)
<i>Natural Disaster</i>	-0.039	-0.039	0.143	0.135
	(-0.15)	(-0.14)	(0.76)	(0.64)
<i>LnEstablishment_Size</i>	-0.720***	-0.703***	-0.522***	-0.530***
	(-4.94)	(-4.77)	(-4.61)	(-4.68)
<i>Hours per Employee</i>	0.000	0.000	0.000	0.000
	(0.32)	(0.10)	(0.39)	(0.15)
<i>LnOper_Segments</i>		0.172		0.144
		(1.01)		(0.53)
<i>Capex</i>		1.369		-2.709
		(0.47)		(-1.52)
<i>LnAT</i>		0.326*		0.266*
		(1.70)		(1.73)
<i>Lev</i>		0.143***		0.064*
		(4.25)		(2.01)
<i>M/B</i>		0.036*		0.034**
		(1.80)		(2.09)
Firm FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Observations	2,633	2,556	2,633	2,556
Adjusted <i>R</i> <sup>2</sup>	0.609	0.618	0.599	0.612

### Appendix A3. The effect of 2008 financial crisis on firms' ROA, annual stock returns and employment growth rates

This table reports the change of ROA, annual stock returns and employment growth rates around the 2008 financial crisis between Delaware-incorporated and other firms in our matched sample. The sample period is from 2006 to 2011 (i.e., the same period for our baseline analysis in Table 3). *ROA* is calculated as EBIT divided by total asset. *Annret* is the annual buy-and-hold return compounded using daily returns of a firm. *Emp\_growth* is the growth rate in the number of employees in all establishments of a firm. *DE* is a dummy variable that equals one if a firm is incorporated in Delaware, and zero for otherwise. *Post08* is a dummy variable that equals one for years since 2008. Robust standard errors are clustered at the incorporation-state level. *t*-statistics are reported in parentheses. \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% level, respectively.

Y =	<i>ROA</i>	<i>Annret</i>	<i>Emp_growth</i>
	(1)	(2)	(3)
<i>DE</i> × <i>Post08</i>	0.001 (0.21)	-0.057 (-1.36)	-0.024 (-0.46)
<i>LnOper_Segments</i>	-0.003 (-0.66)	-0.004 (-0.04)	-0.028 (-0.96)
<i>Capex</i>	-0.114*** (-2.75)	-1.217* (-2.00)	0.028 (0.11)
<i>LnAT</i>	-0.000 (-0.08)	-0.519*** (-11.22)	-0.033** (-2.42)
<i>Lev</i>	-0.005*** (-5.97)	0.387*** (25.92)	0.006** (2.63)
<i>M/B</i>	0.003*** (7.82)	-0.033*** (-6.76)	-0.006*** (-3.12)
Firm FE	YES	YES	YES
Year FE	YES	YES	YES
Observations	2,628	2,623	2,556
Adjusted <i>R</i> <sup>2</sup>	0.713	0.274	0.126

#### Appendix A4. Robustness check with KLD data: Excluding years from 2008 to 2010

This table reports the results on the effect of the Gantler ruling on workplace injuries alternatively measured by the KLD indicator for health and safety concern by excluding financial crisis affected years, that is, years 2008 - 2010. The analysis is at the firm level and the sample period for this test is from 2006-2007, 2011 to 2014. A linear probability model is estimated. *DE* is a dummy variable that equals one if a firm is incorporated in Delaware, and zero for otherwise. *Post* is a dummy variable that equals one for years since 2009. *t*-statistics are reported in parentheses and are based on robust standard errors clustered at the incorporation-state level. \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% level, respectively.

Y =	<i>Employee health and safety concern (0/1)</i>	
	(1)	(2)
<b><i>DE × Post</i></b>	<b>-0.097***</b> (-3.59)	<b>-0.100***</b> (-3.64)
<i>LnOper_Segments</i>		0.033** (2.61)
<i>Capex</i>		-0.302* (-1.88)
<i>LnAT</i>		0.057*** (5.97)
<i>Lev</i>		-0.018** (-2.37)
<i>M/B</i>		-0.001*** (-2.90)
Firm FE	YES	YES
Year FE	YES	YES
Observations	2,811	2,771
Adjusted <i>R</i> <sup>2</sup>	0.413	0.418

## Appendix A5. The spillover effect of the Gantler ruling to non-Delaware states

This table reports the DiD analysis results on the potential spillover effect of the Gantler ruling on workplace injuries by separating firms into those that have at least risk executive serving on the board of director (the control firms) and those firms in which none of the risk executives serve on the board of director (the treatment firms). *Injuries/Hours* is the total number of workplace injury cases divided by the number of hours worked by all employees in an establishment in a given year, then multiplied by 200,000. *DART Injuries/Hours* is the number of severe workplace injury cases that result in days away from work, restricted work activity, or job transfer, divided by the number of hours worked by all employees in an establishment in a given year, then multiplied by 200,000. *Post* is a dummy variable that equals one for years since 2009. *None of REs serving on board* is a dummy variable that equals one if none of the key executives who have certain responsibility for risk management (i.e., CRO or equivalent, CLO, CCO, and CFO) serve on the board of a firm in year 2008. Columns (1) and (2) report the results using the baseline sample. Columns (3) and (4) show the results after dropping the establishments belong to firms incorporated in Delaware. *t*-statistics are reported in parentheses and are based on robust standard errors clustered at the incorporation state level. \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% level, respectively.

Y=	<i>Baseline sample</i>		<i>Exclude DE obs.</i>	
	<i>Injuries/H</i>	<i>DART</i>	<i>Injuries/</i>	<i>DART</i>
	<i>ours</i>	<i>Injuries/Hours</i>	<i>Hours</i>	<i>Injuries/Hours</i>
	(1)	(2)	(3)	(4)
<b><i>None of REs serving on board</i> ×× <i>Post</i></b>	-0.579** (-2.64)	-0.588** (-2.70)	0.057 (0.13)	0.022 (0.06)
Control variables as in Table 3	YES	YES	YES	YES
Establishment & Year FE	YES	YES	YES	YES
Observations	9,239	9,239	2,195	2,195
Adjusted $R^2$	0.641	0.632	0.648	0.651