Shareholder Litigation and Workplace Safety

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Abstract

We examine the impact of shareholder litigation threat on workplace safety. Using the staggered adoption of Universal Demand (UD) laws across U.S. states as a quasi-natural experiment, which increased the procedure hurdles for derivative lawsuits, we find that weakened shareholder litigation rights led to rises in workplace injury rates. The impact is more pronounced for firms with weak monitoring by institutional investors and the board, in less competitive, low union coverage, or low skilled industries. Safety inputs are significantly reduced after UD law adoptions. Overall, our findings suggest that the threat of shareholder litigation incentivizes managers to keep workplaces safe.

JEL Classification: G39, J28, K22

Keywords*:* Workplace Safety; Shareholder Litigation; Universal Demand Law; Corporate Governance.

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1. Introduction

Workplace injuries and illnesses impose significant costs on workers and the economy. In the early 1900s, workplace deaths and disabilities were quite common.[1] Although much progress has been made since then, there are still over 5,000 workplace fatalities and around 3 million nonfatal occupational injuries and illnesses occurring each year in the US.[2] These incidents are estimated to cost the economy $550 billion a year, in addition to human suffering and loss of life (Zohar, 2014). The recent outbreak of the COVID-19 pandemic further highlighted the importance of workplace safety to workers and the economy. As shareholders are increasingly paying attention to and exerting influence on firms' environmental and social (ES) performance, it is vital to understand how shareholders can directly influence employee safety and health in their firms. In this paper, we examine how the threat of shareholder litigation can affect workplace safety. We find that weakened shareholder litigation rights reduce managerial incentive to invest in workplace safety and lead to more workplace injuries and illnesses.

Although shareholders and employees often have conflicting interests in a firm, their interests in workplace safety are aligned to a large degree in the long term. In competitive markets, most safety-related costs are eventually borne by shareholders. Besides direct costs associated with workplace injuries such as medical costs and disruptions to operations, employers with poor safety records pay higher workers' compensation insurance premiums, wage differentials, employee turnover costs, and reputation costs in equilibrium (Viscusi, 2005). Hence, while improving workplace safety requires significant capital investments and expenditures on training, monitoring,

[1] It was estimated that between 18,000 and 23,000 workers died each year from workplace injuries in the early 1900s (National Safety Council, 1998).

[2] See https://www.bls.gov/iif/, accessed on March 08, 2021. Globally, there are 3 million employees killed each year on the job and an additional 375 million injured (International Labor Organization, 2021). Takala et al. (2014) find that economic costs of work-related injury and illness vary between 1.8 and 6.0% of GDP in country estimates, with the average being 4%.

and preventive maintenance, these investments often benefit shareholders in the long term. Consistent with workplace safety having a positive impact on firm value, Cohn and Wardlaw (2016) find that a one-standard-deviation decrease in injury rate is associated with a 6.1% increase in firm value as measured by Tobin's Q.

The long-term benefits of safety investments to shareholders give shareholders a legal ground to sue managers when they believe that managers underinvested in safety[3]. One important type of lawsuit they can bring against directors and officers is derivative suits, which shareholders file on behalf of the corporation to demand changes in firm policies and punish directors and managers who fail to fulfill their fiduciary duties.[4] Another type of lawsuit shareholders can bring about is direct securities class action suits in which shareholders who have suffered considerable financial losses due to managers' misleading statements or non-disclosure of material information sue the firm for compensation. In both cases, directors and officers are likely to suffer negative labor market consequences if these suits prevail (Ferris et al., 2007; Brochet and Srinivasan, 2014). Even if the suits do not prevail, being sued likely distract managers and damage their labor market reputation (Helland, 2011; Donelson, et al., 2019). Thus, the threat of shareholder litigation can incentivize managers to invest more in workplace safety. Since shareholder class action suits, usually triggered by precipitous sharp share price drops, have stricter prerequisites than derivative suits and many safety failures may not involve violation of securities laws, derivative litigation is likely to present a more significant threat to managers than class action litigation in incentivizing managers to keep their workplace safe.

[3] In theory, shareholders can also sue managers for overinvesting in workplace safety as overinvestment destroys shareholder value too. However, shareholders rarely do so in practice because their suits are typically triggered by negative safety news or events that are associated with underinvestment in safety.

[4] It should be noted that liability insurance for directors and officers (D&O insurance) does not completely shield the company and its officials from the effects of derivative lawsuits. The detailed explanations are offered in Houston et al. (2018).

Anecdotal evidence suggests that shareholders do file derivative lawsuits following significant safety accidents. Take the Deepwater Horizon explosion as an example. On April 20, 2010, the Deepwater Horizon drilling rig, leased by BP, exploded off the Louisiana coast. Eleven men lost their lives, and seventeen were injured. On May 17, 2010, a shareholder derivative lawsuit was filed against BP and its directors and officers, alleging that the defendants "elected to cut costs, including safety and manufacturing expenditures in pursuit of profitable results, even lobbying regulatory authorities to remove or decrease the extent of safety and maintenance regulation." While the Deepwater Horizon is one of the most prominent legal cases, it is not an exception.[5] During the current COVID-19 pandemic, law firms have also advised directors and officers to carefully deal with the COVID-19 risk to avoid being sued by shareholders. On February 10, 2021, a shareholder derivative lawsuit was filed against Tyson Foods and its directors and officers, alleging Tyson officials "took minimal precautions to prevent the outbreak of COVID-19 at its facilities," placing the health of its employees at risk and failing to maintain "even the most basic preventive measures" to combat the spread of the virus in Tyson plants. These examples suggest that shareholder litigation can be a real threat to managers when they grossly mismanage workplace safety.[6]

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[5] There are several other high-profile derivative suits related to workplace safety. For example, Pacific Gas and Electric (PG&E) agreed in 2017 to pay $90 million to settle derivative lawsuits that blamed the 2010 San Bruno pipeline disaster on corporate mismanagement. The total pay-out from PG&E, including regulatory penalties and civil claims settlements added up to more than $2.2 billion. See https://www.nbcbayarea.com/news/local/pge-to-pay-90-million-to-shareholders-over-san-bruno-management-failures/46440/. An explosion at the Massey Energy Company killed 29 workers in April 2010. Shareholders filed both derivative and class action lawsuits alleging that Massey's former directors and officers caused the company wilfully to disregard safety regulations. The suits were dismissed on the ground that the shareholders lacked standing because they no longer held shares of the corporation due to an intervening merger. See, https://clsbluesky.law.columbia.edu/2017/05/25/paul-weiss-discusses-dismissal-of-breach-of-fiduciary-duty-claims/. Similar to Massey Energy case, shareholders also filed a class action lawsuit against BP for the Deepwater Horizon explosion case.

[6] The derivative suit was filed at the U.S. District Court for the Eastern District of New York at Brooklyn. Case No.: 1:21-cv-730, *Hugues v. White et al.*. The case was reported by Bloomberg Law, Feb 12, 2021.

This paper empirically tests the effect of the threat of shareholder litigation on workplace safety. We collect establishment-level workplace injury and illness data from the Occupational Safety and Health Administration (OSHA) Data Initiative Program (ODI) between 1996 and 2011. An increase in injury and illness rate (for brevity, injury rate henceforth) generally indicates a decrease in workplace safety. To identify exogenous changes in the threat of shareholder litigation, we exploit the staggered adoption of Universal Demand (UD) laws across U.S. states over our sample period. The passage of UD laws raises the procedural hurdles for shareholder derivative lawsuits and reduces affected firms' litigation risk. Since these laws are passed at the incorporation state level, their adoption is unlikely to be endogenous to changes in workplace injury rate at the establishment level. We then employ a difference-in-differences (DiD) design to estimate the effect of the passage of UD laws on the establishment-level injury rate.

We find that the adoption of UD laws is associated with a significant rise in the injury rate. The number of injuries per 100 full-time equivalent (FTE) employees per year increases by between 0.90 and 1.17 cases in treatment establishments relative to control establishments, depending on the model specification. Percentage-wise, the passage of a UD law is associated with a rise of the injury rate between 9.6% and 12.5% relative to the sample mean at 9.39 cases per establishment. In all specifications, we include establishment, industry-year, and establishment state-year fixed effects to account for establishment-, industry-, and geographic-level heterogeneity. A dynamic analysis shows no pre-trend in the UD law effect, supporting the parallel trend assumption underlying our DiD approach. Specifically, the changes in injury rate are statistically indifferent between treatment and control establishments before the passages of UD laws. After the passage of UD laws, there is a persistent increase in injury rate in treatment establishments relative to control establishments, with the initial effect appearing one year afterward.

In cross-sectional tests, we find that the UD law effect is concentrated in the subsamples of treatment establishments whose parent firms have low institutional ownership, a low proportion of independent directors on the board, and are in less competitive industries. Furthermore, the UD law effect is more pronounced when institutional investors have less time to monitor due to distractions by exogenous events unrelated to the focal firm (Kempf, et al., 2017). These results suggest that the rise in injury rate after the UD law adoption is mainly driven by a decrease in the threat of shareholder litigation against genuine agency problems, and the adoption of UD laws appears to have worsened the underinvestment problem in safety due to a rise in agency problems. Related to the labor market conditions, we find that the UD law effect is concentrated in industries with low union coverage and a higher proportion of low-skilled employees. These findings are consistent with the extant literature that labor unions constrain managers' ability to change workplace safety (Weil 1992, Kaufman 2005), and poor workplace safety increases employee turnovers and, since it is more costly to replace high-skilled employees (Visconsi 1979, Cottini et al. 2011), managers face higher cost of lowering safety levels in high-skilled industries.

To understand the specific changes that occurred in treated firms that could lead to higher injury rates, we examine two approximate measures of safety inputs. Johnson, Schwab, and Koval (2020) argue that one salient indicator of employers' level of input into workplace safety is compliance with government regulations. We find that the probability of an establishment being found to be noncompliant with OSHA safety standards during an unscheduled OSHA inspection increases by 33% per year post-UD law adoption relative to the sample mean level of 0.54. The increase in the probability of having a serious violation of OSHA safety standards post-UD law adoption, which is defined as a violation that carries a fine, is 44% higher per year in treatment establishments relative to the unconditional likelihood of 0.39. Another safety input measure is the

parent firm-level safety spending, proxied by its Selling, General, and Administrative expenses (SG&A) per employee. Although safety expenditures are not reported separately, most of such expenditures are reported in a firm's SG&A expenses[7]. We also follow Caskey and Ozel (2017) to calculate an abnormal SG&A spending measure to capture the departures from a benchmark level. Consistent with treated firms cutting safety expenditures in the post-UD law period, we find that both total SG&A per employee and abnormal SG&A per employee fall significantly in treated firms than control firms.

We conduct a battery of tests to check the robustness of our main results. Firstly, the UD law setting has been used to study the effect of shareholder litigation on a number of corporate decisions in recently published and contemporaneous working papers (see Appendix A in Donelson et al., 2021). This raises two concerns about our findings. One is that the increase in injury rate might be fully mediated by changes in these other variables. If this were true, the threat of shareholder litigation would not have a *first-order* effect on managerial safety decisions and efforts. The other is that the reuse of natural experiments weakens the statistical power of our test. We address the first concern by explicitly controlling for the variables that can be correlated with workplace safety and other studies find could be affected by UD laws. They include profitability, risk-taking incentives, managerial entrenchment, and informational environment. The statistical and economic significance of our main result is not affected by adding these controls. For the other concern, Heath et al. (2021) recommend using a higher threshold for statistical significance to deal

[7] Workplace safety expenditures are not mandatory for corporate filings, but some anecdotes suggest that it can be substantial. For example, Patterson-UTI Drilling Co. LLC, a drilling company, spent $150 million on training and safety improvements over the decade of 2001 to 2010, which amounts to 7% of its total income and 32% of its SG&A expenditure during the period. See https://www.mysanantonio.com/news/energy/article/Eagle-Ford-pay-is-high-but-work-can-be-fatal-4285405.php.

with the problem of multiple hypothesis testing using the same natural experiment. We confirm that the vast majority of our results surpass the higher threshold for statistical significance.

Secondly, only a small fraction of observations in our sample is from states that adopted a UD law during the sample period.[8] This raises the concern that a single outlier state can have a significant effect on our estimate. In addition, Donelson et al. (2021) raise doubt about the conclusions of some prior UD law studies by showing that the treatment effects in some individual states have the opposite signs to each other while all being statistically significant. Thus, we estimate the UD law effect state by state. We find that the treatment effects are quite uniform across states. Out of the seven states that adopted a UD law during our sample period and have workplace injury data, only in one of them the treatment effect does not have the hypothesized sign, and the coefficient of which is insignificant. It is noteworthy that the treatment effect is statistically significant for firms incorporated in Pennsylvania, whose UD law was mandated by the state supreme court and thus the treatment effect is free of endogeneity concerns about corporate lobbying.

Lastly, our main results remain robust when we only include the more serious injuries when calculating the injury rate or using the number of injuries as the dependent variable in a Poisson model. Overall, these results suggest that the threat of shareholder litigation is an economically important determinant of workplace safety and that increasing the hurdle of shareholder litigation decreases the level of workplace safety.

[8] This is due to two reasons: first, the state of Delaware, the incorporation state for most corporations in the U.S., never passed a UD law; and second, our workplace injury data began in 1996 and, as a result, states which adopted a UD law before 1997 are not in our treatment sample.

This paper contributes to nascent finance literature on workplace safety. Traditionally, research on workplace safety has been done in diverse fields such as organizational behavior, labor relations, and industrial psychology[9]. Its connection with finance and corporate governance has been largely unexplored with the following exceptions. Filer and Golbe (2003) investigate how a firm's capital structure and operating margin affect workplace safety violations. Cohn and Wardlaw (2016) show that financial constraints adversely impact investment in workplace safety. These studies suggest that a firm's financial conditions affect workplace safety investments. Caskey and Ozel (2017) find that managers cut workplace safety investments to meet earnings targets. Cohn, et al. (2020) find that private equity buyouts result in increased workplace safety investments. Both papers suggest that the pressure to meet short-term financial performance targets makes managers compromise their firm's workplace safety. Bradley et al. (2021) find that greater analyst coverage reduces workplace injuries. We contribute to understanding the determinants of workplace safety investments from the corporate governance perspective. We argue that workplace safety is negatively affected by agency problems and consequently document a significant role of shareholder litigation as a governance mechanism in disciplining directors and officers for neglecting workplace safety, thus complementing Ferris et al. (2007) and Appel (2019).

Employee health and well-being have a broader social impact. It is one of the United Nations Sustainable Development Goals (SDGs)[10]. Consequently, our paper contributes to the literature on the effective mechanisms for shareholders to improve corporate environmental and social (ES) performance. In theory, shareholders can do so via three channels - voice, exit, and litigation. Several studies show that large index funds such as Blackrock, Vanguard, and State Streets (i.e.,

[9] See a survey by Hofmann et a. (2017).
[10] See, https://sdgs.un.org/goals.

the “Big Three”) are effective at pushing their portfolio firms to improve ES performance via voice. Barzuza et al. (2020) document that index funds have taken a leading role in challenging management and voting against directors to advance board diversity and corporate sustainability. Azar et al. (2021) find that the Big Three ownership and their engagement with the portfolio firms could lead to the reduction of corporate carbon emissions. Gormley et al. (2021) find the Big Three's significant role in increasing gender diversity on corporate boards. However, the role of litigation in affecting corporate ES performance has been little studied. Our study suggests that the threat of litigation can be another helpful strategy that investors can use to pressure firms to improve their performance on ES issues. This strategy can be especially useful for shareholders who do not hold large stakes in their portfolio firms and thus are unlikely to have significant influence through voice.

Lastly, we contribute to the literature on shareholder litigation and its impacts on corporate decisions. Prior studies show that shareholder derivative litigation is an essential component of corporate governance (see Ferris et al. 2007, Appel 2019). As such, the passage of UD laws has been linked with disclosure quality (Boone et al., 2019), cost of capital (Houston et al. 2019), board quality (Masulis et al. 2019), innovations (Lin et al. 2020), capital structure (Nguyen et al. 2020), insider trading (Adhikari et al. 2021), and other significant corporate actions. To the best of our knowledge, we are the first to explore the impact of shareholder litigation risk on a firm’s employee health and safety. Despite the concerns of frivolous shareholder lawsuits (Romano 1991), it appears that shareholder derivative litigation has a real beneficial impact.

The rest of the paper is organized as follows. The institutional background discussions are included in Section 2. Section 3 describes the data collection procedures and reports sample summary statistics. The model specification and empirical methodology are presented in Section

4. Section 5 includes the main results and cross-sectional heterogeneous firms' responses to the adoption of UD laws. The robustness checks and the issues related to the reuse of UD law adoption as a natural experiment are considered in Section 6. We conclude the paper in Section 7.

2. Institutional Background

2.1. *Shareholder Derivative Lawsuits and Universal Demand Laws*

Directors and officers of a corporation have duties of loyalty and care to their shareholders. If they fail to fulfil these duties, shareholders can sue them on behalf of the corporation through derivative litigation. Besides derivative suits, shareholders may file direct class action lawsuits under Rule 10b5 of the Securities Exchange Act of 1934, alleging damages through stock value loss. In contrast to the class action lawsuits, where the shareholders in a specified class receive an award of damages if they win in court, monetary reward in derivative litigation is paid back to the company treasury rather than the plaintiff shareholders. Thus, the settlements of derivative suits often center on governance reforms and improving internal controls.[11]

In derivative litigation, shareholders generally are first required to make a written *demand* to the board of directors that identifies the alleged wrongdoing and demands that the corporation act. The directors will consider the demand and may expand the board to include independent directors to form a special litigation committee to study it. If the board refuses to comply with the demand, the shareholders may bring a derivative lawsuit only if they can show that the board's rejection was wrongful after passing the Business Judgment test, which is a very high hurdle to clear.[12]

[11] For more detailed explanations of derivatives lawsuits and their impact on corporate governance reforms, please see Matheson (2016), Appel (2019), among others.

[12] "To show a wrongful rejection, a shareholder must overcome a presumption that in making a business decision, the board honestly believed that it has acted in the best interest of the corporation, on an informed basis and in good faith, afforded to corporate boards by the so-called business judgment rule. If the shareholder cannot demonstrate wrongful rejection of a demand, the court will dismiss the derivative complaint for failure to state a claim." See the entry titled "Wrongful Refusal of Demands in Shareholder Derivative Litigation," published on 22 Jun 2015, on the website of

Therefore, essentially there are two suits involved. "First, it is the equivalent of a suit by the shareholders to compel the corporation to sue. Second, it is a suit by the corporation, asserted by the shareholders on its behalf, against those liable to it."[13] In most states, if a demand is required but not made by shareholders, the court will dismiss the suit.

Because derivative suits typically name some directors as defendants, the board's decision poses a conflict of interest. Solovy et al. (1990, p. 864) noted that "[i]n the overwhelming majority of cases, special litigation committees have sought to have shareholder derivative suits dismissed." Recognizing this inherent conflict, courts have historically provided some exceptions to the demand requirement. Cases in which demand is excused are called "demand futile." For example, suppose the majority of the board responding to the demand are themselves being accused of the wrongdoing. In that case, the demand requirement can be voided, especially when the board's actions cannot pass the litmus test of the business judgment rule (Hamilton 2000, page 544).

Not surprisingly, plaintiffs almost always argue that the demand is futile rather than making a demand on the board. They frequently name directors as defendants, so the futility exception enables shareholders to circumvent the demand requirement by filing a derivative lawsuit without board approval. Doing so is more time- and cost-efficient for the plaintiff shareholders. However, many in the legal community and corporate world believe some derivative actions are frivolous and need to be curtailed (Coffee 1986, Romano 1991, Brandi 1993). Consequently, between 1989 and 2005, 23 states eliminated the futility exception with a Universal Demand (UD) requirement that imposes a significant hurdle for shareholder derivative litigation by always requiring the

Thomson Reuters Practical Law: https://content.next.westlaw.com/w-000-4099?__lrTS=20200811185717126&transitionType=Default&contextData=(sc.Default)&firstPage=true.

[13] *Aronson vs. Lewis*, 473 A.2d 805.

board's approval of the shareholders' demand. In summary, the UD law presents a significant obstacle to derivative suits. Both Appel (2019) and Lin et al. (2020) find that the number of shareholder derivative lawsuits in a state dropped significantly as soon as it adopted UD law.[14]

Besides derivative litigation, shareholders can also sue their firm for wrongdoing through class actions. This leads to a concern that, by raising the hurdle of derivative lawsuits, UD laws may encourage shareholders to file class actions instead. As a result, the adoption of UD laws does not reduce the management's total exposure to shareholder litigation. However, Lin et al. (2020) find that between 1996 and 2013, the number of class actions aggregated at the incorporation state level did not significantly increase after the adoption of UD laws.[15]

It has been shown that the vast majority of shareholder class actions lawsuits are filed after significant stock price falls, alleging the misstatement or non-disclosure of material information by managers under Rule 10b-5 of the Securities and Exchange Act of 1934 (Kim and Skinner 2012). Although workplace safety can be detrimental to shareholder value in the long term and sometimes a significant incident may trigger a sharp stock price drop, initiating a derivative lawsuit does not rely on a precipitated drop in share prices within a short period. Instead of recovering some shareholders' loss of money in the stock market, the emphasis of derivative litigation on changing corporate policy and internal governance makes derivative lawsuits a more suitable disciplinary tool for shareholders to push managers to improve workplace safety. Thus, our study focuses on shareholders' derivative litigation.

[14] Donelson et a. (2021) recently show that the decline in derivative lawsuits after UD laws loses statistical significance even though the magnitude remains similar, when the sample is extended past 2010 by including the passage of UD laws in Washington, DC in 2011 and Louisiana in 2013. This finding is unlikely to alter our result since our sample period is from 1996 to 2011, and without the consideration of the changes in UD laws in these two states.

[15] Lin et al. (2020) propose two possible reasons for this finding. First, filing shareholder class actions needs to satisfy several prerequisites that derivative actions do not need to meet. Secondly, class actions and derivative lawsuits may have different underlying motivations.

2.2. Workplace Safety Regulation and Reporting

According to the OSH Act enacted in 1970, OSHA is the federal agency responsible for setting and enforcing workplace safety standards. Employers must comply with all applicable OSHA standards to keep their workplace free of serious hazards.[16] OSHA's main activities include the promulgation of safety standards, education about workplace hazards, and inspection of work sites under its jurisdiction. For firms not in compliance with regulations, OSHA imposes modest financial penalties. The maximum penalty for willful or repeated violations in 2020 was $134,937 per violation, indexed on the inflation rate. While the dollar amount of penalty *per violation* may seem inconsequential, the total penalty can be in the millions.[17]

OSHA began to survey private-sector establishments annually under the Data Initiative Program (ODI) in 1996 to better target enforcement and compliance effort, collecting data on injuries and acute illnesses attributable to work-related activities from approximately 80,000 establishments each year[18]. Along with this data, OSHA also collects information about establishment name, location, number of employees and hours worked, and unusual events such as strikes, shutdowns, and disasters.

The sample selection of the ODI program ensures that all relevant establishments in the potential data collection universe are surveyed at least once during a three-year cycle. To a large degree, OSHA adopts a random sampling method to select establishments, but those establishments that failed to respond or had high injury/illness rates are likely to be surveyed again. Once surveyed, establishments are required by Public Law 91-596[19] to maintain recordkeeping of

[16] See the webpage at https://www.osha.gov/laws-regs.
[17] The top enforcement cases by OSHA can be found in: https://www.osha.gov/dep/enforcement/top_cases.html
[18] The ODI Program covered establishments with a minimum of 60 employees in the year 1996 and 1997, 50 employees in 1998, and 40 employees between 1998 and 2011.
[19] See, https://uscode.house.gov/statutes/pl/91/596.pdf.

injuries and illnesses unless exempted by OSHA. Establishments that fail to submit a completed data collection form may be subject to OSHA enforcement actions, including the issuing of a citation and assessment of penalties. OSHA ceased ODI data collection after the year 2011 due to budget cuts.

3. Data and Summary Statistics

3.1. Data sources and sample construction

Our primary explanatory variable, *UD Law*, is an indicator variable that equals one for all years after a firm's incorporation state passed a UD law and zero otherwise. The information on UD law adoption at the state level is obtained from Appel (2019) and listed in Table A1 in the Appendix. Because some firms may change their incorporation state over time, we code *UD Law* based on a firm's historical state of incorporation for correct inference.[17]

The data on establishment injuries and illnesses are obtained from the OSHA ODI dataset from 1996 to 2011. OSHA initiated the ODI annual surveys in 1996 to collect injury and illness data on private-sector employers and ended the program in 2011. Each establishment in the data set has a unique physical location with detailed demographic information. Broadly speaking, OSHA covers agriculture, construction, manufacturing, transportation, trade, and service industries that are considered high-hazard ones.[20] Table A2 in the Appendix presents the distribution of workplace injuries and illnesses in the U.S. private sector in 2011 by cause (Panel A) and nature (Panel B).

[17] The data for historical incorporation state are obtained from the website of Professor Bill McDonald, who compiled firms' state of incorporation based on the original SEC filings since 1994. About 5% of the firms in our sample changed their incorporation state during the sample period. Since these changes are likely to be endogenous, we repeat our analysis excluding them in an unreported exercise. We find that our main results continue to hold.

[20] The high-hazard industries refer to those which have a DART rate of 5.0 or greater. The Days Away, Restricted, or Transferred (DART) Rate is explained with details in Section 3.2. See https://www.industrysafe.com /blog/osha-r1,610ecordkeeping/what-is-a-dart-rate.

Given that the ODI dataset does not contain a unique parent firm identifier for establishments, we manually match establishments from the ODI dataset to their parent firm in the Compustat database based on company names. Like Caskey and Ozel (2017), we first search directly for parent firm names in the Compustat database for establishments in the ODI. If the search does not produce any matches, we then conduct internet searches through Google, Hoovers, and company websites and confirm the establishments' corresponding Compustat parent firm. In some cases, an establishment is matched to a hierarchy of parent firms based on this process; then, we match it to the nearest parent firm in the hierarchy. If an establishment changed its parent firm due to a merger, we find its historical parent before the merger and match it to that for the period before the merger.

After merging the ODI data with the Compustat database, we exclude observations with either missing information for firms' historical incorporation states or missing values for the crucial variables of interest. We further exclude financial (SIC codes 6000-6999) and utility (SIC codes 4900-4999) firms. Finally, we winsorize all continuous variables at the 1st and 99th percentiles to reduce outliers' influence. Our final sample contains 76,297 establishment-year observations 1,262 firms (with 14,932 establishments). The treatment group includes 224 firms and 1,699 establishments. The control group has 1,038 firms and 13,233 establishments. Among the 1,262 firms in our sample, 877 (69.5%) firms' headquarters are located differently from their incorporation states. Among 14,932 establishments, 14,136 (94.7%) establishments are outside of the firm's incorporation state. Notably, some large corporations have numerous establishments, such as Home Depot Inc, FedEx Corporation, and Kindred Healthcare.

In the robustness tests, we employ a variety of control variables. The detailed descriptions of data used for control variables will be explained in the context of these tests.

3.2. *Definitions of Workplace Injury Variables*

OSHA collects data and reports three injury rates. (1) The Total Case Rate (*TCR*) is the primary metric for establishment-level injury rate. It is defined as the number of work-related injuries per 100 full-time employees (FTE) during a one-year period. [21] It includes all recordable cases of nonfatal injuries and illnesses. A case is OSHA recordable if it involved treatment beyond first aid or a diagnosis of significant injury or illness. (2) The Case Rate of Days Away, Restricted, or Transferred (*DART*) counts the number of injuries and illnesses resulting in days away from work or job restriction or transfer per 100 FTE over a one-year period. Unlike *TCR*, *DART* includes only those injuries and illnesses that have had an impact on workplace activities. It includes anyone who has had to cease working, restricted their work activities, or transferred to a different department or job due to workplace injuries or work-related illnesses. (3) The Case Rate of Days Away from Work (*DAFWII*) is the number of injuries and illnesses resulting in days away from work per 100 FTE over a one-year period. *DAFWII* is a slightly narrower metric than *DART* since it does not account for those workers transferred to a different department or restricted work activities. The latter two rates are used in robustness checks in our analysis. In addition, we also use the total count of cases, the Total Case (*TC*), in a Poisson regression model as a robustness test. *TC* is the total number of injuries and illnesses in an establishment year without adjusting for employees' hours worked. The definitions of these workplace injury measures and other variables of interest are listed in Table A3 in the Appendix for convenience.

3.3. *Summary Statistics*

[21] The Bureau of Labor Statistics defines an incident rate of injuries and illnesses using the following formula: *Incidence rate = (Number of injuries and illnesses* 200,000) / Employee hours worked*. The 200,000 hours in the formula represents the equivalent of 100 employees working 40 hours per week, 50 weeks per year, and provides the standard base for the incident rates. For further detailed explanations of the variable definitions, please see https://www.bls.gov/iif/osheval.htm.

The summary statistics for establishment-level and firm-level variables are reported in Table 1. The mean and median TCR are 9.39 and 7.30, respectively, indicating that an establishment with 100 full-time equivalent (FTE) employees who work for 2,000 hours per year has on average 9.39 injury incidents in a year, and about one-half of the establishments have more than 7.30 injuries in a year. Sample establishments have a median of 135 employees, and employees work for a median of 1,994 hours per year. For brevity, we do not discuss other variables in detail. Overall, the establishment-level and firm-level characteristics are comparable to those reported in Cohn and Wardlaw (2016) and Caskey and Ozel (2017).

[Please Insert Table 1 Here.]

The distribution of establishments by the number of employees at the establishment level is shown in Panel A of Figure 1. The distribution of the establishments by Fama-French 48 industry codes is presented in Panel B of Figure 1. Panel A in Figure 2 reports the total case rate (TCR) distribution for establishment-year observations in our sample. Panel B in Figure 2 presents the distribution of the average TCR by Fama-French 48 industry codes for establishment observations. The Healthcare, Automobile and Trucks, and Transportation industries have the highest injury rates, while the Electronic Equipment, Petroleum/Natural Gas, and Computers sectors have the lowest.

[Please Insert Figures 1 & 2 Here.]

4. Empirical Methodology

Our empirical specification exploits the staggered adoption of UD law by U.S. states as a source of exogenous variation in the risk of shareholder litigation. In line with Bertrand and Mullainathan (2003), we estimate the following difference-in-differences (DiD) model at the establishment level.

$$TCR_{i,j,l,k,s,t} = \alpha + \beta * UD\ \ Law_{k,t} + \gamma X_{j,t-1} + \delta Y_{i,t-1} + \theta_i + \mu_{lt} + \pi_{st} + \epsilon_{i,j,l,k,s,t} \qquad (1)$$

The subscripts i, j, l, k, s, and t refer to an establishment, firm, industry, firm's state of incorporation, establishment state of location, and year, respectively. *TCR* is the total case rate for an establishment-year; *UD Law* is an indicator variable which equals one if a state has adopted the UD Law by year t and zero otherwise. β is the coefficient of main interest because it measures the treatment effect of *UD Law* on the outcome variable. The vector $X_{j,t-1}$ contains firm characteristics and the vector $Y_{i,t-1}$ establishment characteristics. The inclusion of and justification for these firm-level and establishment-level control variables will be discussed shortly. θ_i represents establishment fixed effects, μ_{lt} represents establishment industry-year fixed effects that capture unobserved industry shocks to workplace injury rates, and π_{st} represents establishment location state-year fixed effects that capture unobserved shocks at the establishment's location state level that may drive changes in workplace injury rates. $\epsilon_{i,j,l,k,s,t}$ is the error term. We cluster heteroskedasticity-robust standard errors at the incorporation state level.

In this framework, the treatment effect of the UD law is identified by comparing changes in workplace injury rates around the adoption of UD law for treatment establishments to changes for control establishments that are in the same industries and located in the same states as the treatment establishments.

To illustrate, consider two establishments located in New York, E_D and E_M. Both are in the same industry. E_D belongs to a Delaware incorporated firm and E_M to a Massachusetts incorporated firm. No UD law has ever been passed in Delaware. Massachusetts passed its law in 2004 and so we can compare the change in E_M's injury rates with the change in E_D's injury rates around 2004. Since both are located in New York, they will be affected by similar state-level economic and

political shocks. However, only E_M will be affected by the change in UD law. Thus, our estimate is free of endogeneity concerns over the unobserved regulatory environment or economic factors in an establishment's location state that may have coincided with the UD law's passage.

Identifying the relationship between the risk of shareholder litigation and workplace safety in the DiD model rests on two key assumptions. The first one is that the passage of UD laws is exogenous to workplace safety in affected establishments. Although anecdotal evidence suggests that different interest groups have lobbied for or against passing a UD law at the state level (for example, see Jost 1994), two observations suggest that the passage of UD laws is unlikely to be systematically correlated with workplace safety conditions in firms incorporated in the state. First, the lobbying outcomes are often difficult to predict because there are usually efforts on both sides. Secondly, corporate lobbying efforts for the passage of UD law are unlikely to have been driven by firms' desire to reduce the risk of workplace safety litigation in particular.

To provide some evidence on the validity of this assumption, we estimate a Weibull hazard model following Lin, et al. (2020) at the incorporation state-year level. The dependent variable is the natural logarithm of the time to pass a UD law by a state. The explanatory variable corresponds to the contemporaneous average workplace injury rates across all establishments belonging to an incorporation state in a year. We control several time-varying state-level characteristics to pick up the contemporaneous effects of the state economy and political orientation. Specifically, we include state annual GDP growth rate, state annual unemployment rate, the number of firms incorporated in the state, the governor's political party affiliation, and other relevant factors. Besides using the average injury rates computed from the ODI data, we also check the robustness of our result using the average injury rates obtained from the BLS Survey of Occupational Injuries

and Illnesses (SOII) data. The results in Table 2 suggest that average workplace injury rates at the incorporation state level do not predict the timing of UD law adoption by a state.

[Please Insert Table 2 Here.]

The second assumption of the DiD model is that workplace injury rates in the treatment and control establishments follow parallel trends in the absence of UD law passage. We will show in Section 5.2 that there is no evidence that treatment and control establishments exhibit different time trends in injury rates in the two years preceding the adoption of UD laws. Overall, we find no evidence that the two key assumptions of the DiD method are violated.

5. Results

5.1. *Baseline Regressions*

Table 3 reports estimates from several variants of Equation (1). Column (1) is a full sample regression model including the UD Law indicator, establishment fixed effects, and time-varying industry fixed effects as independent variables. We find that the estimated coefficient of *UD Law* is positive and statistically significant at the 1% level, supporting the hypothesized positive relationship between the risk of shareholder litigation and workplace safety. Relative to establishments not affected by the adoption of UD law in the same year, affected establishments experience an average increase in the total injury rate of 1.167 in the post-adoption period, representing an increase of 12.4% from the sample mean injury rate of 9.387.

In Column (2), we add establishment state-year fixed effects to control for unobserved shocks to injury rates that affect all establishments in a state. For establishments located in their parent firm's incorporation state, the UD law effect is subsumed by these fixed effects. Hence, the UD law effect is estimated from the establishments whose location state is different from their parent firm's incorporation state, accounting for 94.7% of the establishments in our sample. We find that

the *UD Law* coefficient is still positive and statistically significant at the 1% level. Adopting UD law increases the total injury rates by 0.980 in treatment establishments relative to control establishments, representing an increase of 10.4% from the sample mean.

In Column (3), we add controls for the number of employees, the average annual hours worked per employee, and whether there is a strike, a shutdown, hiring of seasonal workers, or a natural disaster and other adverse weather conditions at the establishment level. The coefficient of *UD Law* remains statistically significant at the 1% level. Adopting UD law increases the total injury rate by 0.898 in treatment establishments relative to control establishments, representing an increase of 9.6% from the sample mean.

In Column (4), we further control for parent firm characteristics that are likely correlated with workplace injury rates at the establishment level. At the firm level, Filer and Golbe (2003) and Cohn and Wardlaw (2016) find that workplace safety investments are constrained by a firm's financial condition. Thus, we add the control variables of *Ln(Assets)*, *Cash/Assets*, and *Debt/Assets*. Workplace injuries may also be related to asset utilization efficiency, capital investment, and growth opportunities, so we control for *asset turnover*, *CapEx/Assets,* and *market-to-book ratio*. The estimate shows that the enactment of UD laws increases the total injury rate by 0.922 in treatment establishments relative to control establishments, representing an increase of 9.8% from the sample mean.

[Please Insert Table 3 Here]

5.2. *Dynamic Effects of UD Laws*

Identification in the difference-in-differences approach builds upon the parallel trend assumption, which in our setting requires that injury rates in treatment and control establishments follow a parallel time trend in the absence of UD law. Prior studies have provided an extensive

discussion of this design (see Bertrand and Mullainathan 2003). In this subsection, we examine the dynamic effects of UD law to see if there is evidence of different time trends for treatment and control establishments prior to adopting it.

We replace the single *UD Law* indicator in Equation (1) with six indicator variables to track years relative to the year UD law is adopted: $UDLaw_{-2}$, $UDLaw_{-1}$, $UDLaw_{0}$, $UDLaw_{+1}$, $UDLaw_{+2}$, *and* $UDLaw_{+3+}$, where $UDLaw_k$ is an indicator which equals one for the *k*th year relative to the year UD law is adopted and zero otherwise. For example, for a given establishment, $UDLaw_{-2}$ equals one for the year that is two years before the adoption of the UD law; $UDLaw_{+3+}$ equals one for the years that are three years and beyond after the adoption of the UD law. We then estimate the new regression equation using the full sample. The regression result is reported in Table 4. Consistent with our assumption of parallel trends, the estimated coefficients on $UDLaw_{-2}$ and $UDLaw_{-1}$ are statistically insignificant. The difference in injury rates between treatment and control establishments becomes statistically significant only after the adoption of UD laws, as seen from the coefficients on the UD law indicators for event year 1 through year 3 and beyond. The largest impact occurs one year after the UD law is adopted (coefficient of $UDLaw_{+1}$), which suggests that it takes some time for the reduced threat of shareholder litigation to fully impact workplace injury rates.

[Please Insert Table 4 Here]

Figure 3 plots the dynamic effects of the UD law adoption on establishment injury rates and associated statistical confidence intervals around the UD law adoption.

[Please Insert Figure 3 Here.]

5.3. *Frivolous Lawsuits versus Genuine Agency Problems*

Our main result can be explained by a reduction in the threat of both meritorious and meritless lawsuits because irrespective of whether shareholder lawsuits have merit or not, the higher hurdle of derivative litigation brought by UD laws reduces the expected litigation cost for firms. Since critics often suggest that many shareholder lawsuits are frivolous and without merit, we would like to further explore if our baseline results are driven by a reduction of lawsuits against genuine agency problems or frivolous lawsuits.

Managerial agency problems can lead to underinvestment in safety for the following reasons. First, managers have incentives to avoid costly efforts in a standard principal-agent setting. Since implementing and monitoring workplace safety procedures and promoting a safety culture require managers to exert continuous effort, managers may put insufficient effort to keep the workplace safe when governance is weak. Second, entrenched managers may divert funds for safety investments to other pet projects that maximize their private benefits subject to certain constraints (Jensen and Meckling 1976). Third, managers may cut safety investments as a way to meet short-term earnings goals (Caskey and Ozel 2017). Since underinvestment in safety increases the probability of adverse safety events that may trigger shareholder lawsuits, the threat of shareholder litigation can reduce these agency problems.[22]

To shed light on the extent to which a rise in agency problems explains our baseline results, we examine the effect of the UD law adoption conditional on the strength of other corporate governance mechanisms in place. The agency-based explanation predicts that enacting the UD law should mainly affect the establishments of firms with weak alternative governance mechanisms.

[22] There are also certain types of agency problems which suggest that entrenched managers overinvest in workplace safety. First, entrenched managers may overinvest in safety to avoid potential conflicts with the union and employees in order to live a quiet life (Bertrand and Mullainathan, 2003). Second, they may overinvest to please the union and employees to help them to defend against hostile takeovers (Pagano and Volpin, 2005). If these agency problems dominate, then the passage of UD laws should decrease the injury rates. Our finding obviously is inconsistent with the dominance of these agency problems.

In contrast, the frivolous lawsuits explanation predicts that UD laws should have similar effects on firms irrespective of the strength of the other governance mechanisms.

The other corporate governance mechanisms under consideration are institutional ownership, board independence, and product market competitions. *Institutional Ownership* is measured as the percentage of outstanding shares owned by institutions in a year. *Board Independence* is the percentage of independent directors on the board in a given year. Furthermore, industry competition impacts corporate governance (Giroud and Mueller 2011). To this end, we use the *Product Similarity* score based on textual analysis constructed by Hoberg and Phillips (2016) as a proxy for product market competition. The *High (Low)* subsample denotes whether a firm is above (below) the top tercile of a year in the sample in each governance variable. We find that the increase in workplace injuries following the adoption of UD law is more pronounced if the institutional ownership is low, the board is less independent, and product market competition is low, as reported in Columns (1) – (6) of Table 5.

We also conduct an additional test exploring the exogenous change in institutional investor monitoring due to distractions by their other portfolio firms. The variable, *Shareholder Distraction*, is a score developed in Kempf et al. (2017), which measures the aggregated shareholder distraction in a given year. We then divide our sample observations into high and low shareholder distraction subsamples based on whether the score is above the top tercile of this variable in a given year. In Columns (7) and (8) of Table 5, we report that the UD law effect is concentrated in the high distraction subsample. Overall, these results suggest that our main results are consistent with the agency interpretation.

[Please Insert Table 5 Here.]

5.4. *Labor Market Constraints*

Workplace safety is an essential issue for employee welfare. Thus, unions have great interests in promoting occupational safety and health in the workplace. The presence of a union is likely to diminish the extent to which managers can shirk on safety issues and cut safety investments because labor unions bargain over and participate in the enforcement of safety standards (Kaufman 2005, Weil 1992). Union members are also more educated about workplace hazards and enjoy better protection from retaliation by the management for filing complaints and participating in enforcement actions of OSHA (Johnson, et al., 2020). Consistent with this, unionized firms have fewer workplace injuries (Reilly, et al., 1995; Morantz 2013). Hence, we expect that the enactment of the UD laws has a weaker effect on injury rates in unionized establishments than non-unionized ones.

Because it is difficult to obtain establishment-level unionization data, we collect industry-level union membership data from the Union Membership and Coverage Database[23] and then merge it with our establishment-level injury data. We construct an indicator variable, *High Union Membership*, which equals one if an establishment is in an industry with union membership above the top tercile in a given year and zero otherwise. Column (1) of Table 6 reports that a greater union presence mitigates the effect of UD laws on workers' injury rates as predicted.

Another labor factor that can restrict managerial discretion in lowering safety investment is employee turnover cost. A poor workplace safety record increases employee turnover (see Viscusi 1979, Cottini et al. 2011), and a high turnover rate can harm a firm's business because it is costly to find and train new employees to replace the departing ones. This turnover cost is likely to be higher for replacing high-skilled employees than low-skilled employees. Therefore, we hypothesize that workplace safety investment in establishments with a high share of highly skilled

[23] See, https://www.unionstats.com/.

labor is less affected by the adoption of UD laws. To test this hypothesis, we use the industry-level labor skill data provided by Belo et al. (2017)[24]. *High Skilled Labor* is an indicator that equals one if an establishment is in an industry with a skill index value above the top tercile in a given year and zero otherwise. In Column (2) in Table 6, we show that the establishment-level injury rates in industries that require a higher proportion of highly skilled employees are less affected by the adoption of UD laws.

[Please Insert Table 6 Here.]

5.5. *Change in Safety Inputs*

Workplace injury rates should be negatively related to a firm's safety inputs, which include managerial safety effort and safety investments. Johnson et al. (2020) argue that compliance with government safety regulations is the most salient indicator of a firm's safety inputs. As mentioned in Section 2, OSHA enforces safety standards by conducting on-site inspections. Hence, a decrease in safety inputs should be manifested by increased violations found by OSHA during its on-site inspections. We collect data on OSHA inspection violation incidences and fines from the Department of Labor to test this hypothesis. The data consist of all establishment years in which OSHA inspection occurred. Two dependent variables are defined: *Violation*, an indicator that equals one if the establishment has at least one safety violation under OSHA inspection during the given year and zero otherwise, and *Serious Violation*, which equals one if the establishment has at least one fine-associated safety violation during the given year and zero otherwise. We then estimate a linear probability model similar to Equation (1) using these two variables as the

[24] The labor skill dataset was downloaded from Professor Belo's Google Scholar website. Belo et al. (2017) classify an industry to be a low- or high-skill industry based on the percentage of workers in that industry that work on occupations that require a high level of training and preparation, using the Specific Vocational Preparation (SVP) index from the Dictionary of Occupational Titles (DOT) compiled by the Department of Labor. We also use an alternative labor skill dataset compiled from O*Net, and the result is robust.

dependent variable, respectively. Since establishments are rarely inspected repeatedly during the time interval of our sample, we replace the establishment fixed effects with parent firm fixed effects. As presented in Column (1) of Table 7, the probability of an establishment receiving a citation for violating OSHA safety standards post-UD law adoption increases by 33% (=0.178/0.537) per year relative to the mean level of 0.537. The likelihood of receiving a citation for a serious violation of OSHA safety standards increases by 44% (=0.171/0.39) per year relative to the unconditional likelihood of 0.39.

[Please Insert Table 7 Here.]

Our second measure of safety inputs is a firm's safety expenditures per employee. Safety expenditures are not reported separately by firms. Instead, they fall within the reported item of selling, general, and administrative expenses (SG&A). We use a firm's SG&A expense per employee as a proxy for its level of safety expenditure. For robustness, we also calculate an abnormal SG&A spending per employee measure to proxy for a firm's level of safety expenditures. Following Caskey and Ozel (2017), we calculate *Abnormal SGA/Employee* as the residual from the regression of the SG&A expenses per employee on sales per employee and the inverse of the number of employees for each firm in a given year and within each 2-digit SIC industry. Both the number of employees and the sales are measured at the beginning of the year. We then examine the change in these two variables from before to after a UD law adoption in treatment firms relative to control firms. The results in Table 8 show that the treatment firms reduced both SG&A spending per employee and the abnormal SG&A spending per employee after the passage of a UD law.

[Please Insert Table 8 Here.]

6. Robustness Checks and Discussions

Some published and contemporaneous working papers use the UD law experiment to study the impact of shareholder litigation on various corporate decisions (see Appendix A in Donelson et al., 2021). This section addresses two concerns related to the reuse of the same experiment in our paper. The first one is whether our finding is mediated by the changes in firm policies and governance that these other studies find significant UD law affects. The second is the statistical power issue associated with multiple hypotheses testing when a natural experiment is reused. Furthermore, we break down the average treatment effect by individual states to check if the passage of a UD law has similar effects on workplace injury rates across states and verify the robustness of our main results to alternative dependent variables and models.

6.1. *Is the Result Driven by the Change in Profitability?*

Appel (2019) finds that the adoption of UD laws is associated with weaker operating performance as measured by return on assets (ROA), presumably because of the rise in agency costs in affected firms. Since a firm's financial condition is an important determinant of its safety investments (Filer and Golbe, 2003, Cohn and Wardlaw, 2016), the change in profitability may explain the increase in injury rates that we find. Although this would still be consistent with our main hypothesis, it would suggest that the UD law effect is secondary to the impact of firm profitability. To see if the change in firm performance subsumes the UD effect we have documented, we add a firm's ROA as a control variable to our main specification. As reported in Column (1) of Table 9, we find that the UD law indicator remains statistically significant at the 1% level. The economic effect is similar to that in the main result. The coefficient on ROA is negative but statistically insignificant. Hence, the UD law effect on injury rates is not through the change in firm performance.

6.2. *Is the Result Driven by the Change in Risk-Taking?*

Lin et al. (2020) find that UD law adoption may increase firms' investment in risky, innovative projects and the overall risk-taking incentives more broadly. To ensure that the change in corporate risky investment policy does not drive our result, we control for both the *R&D/Assets* and the stock return volatility of the parent firm in Column (2) of Table 9. The coefficient of *UD Law* remains positive and statistically significant though the p-value increases somewhat, and the coefficient is now significant at the 5% level.

6.3. *Is the Result Driven by the Change in Governance?*

Appel (2019) finds that the passage of UD laws is associated with a weakening of corporate governance,[25] as evidenced by an increase in the Entrenchment index (Bebchuk et al., 2009). This raises the concern that the increase in injury rates could be driven by the weakening of corporate governance associated with the change in the E-index rather than the change in shareholder litigation risk. To address this concern, we explicitly control for the E-index in our regression. In addition, we also control for institutional ownership. After adding these control variables, the coefficient of *UD Law* remains positive and statistically significant at the 1% level. The result is reported in Column (3) of Table 9. We note that Donelson *et al.* (2021) find no evidence that UD law affects corporate governance, which suggests that changes in corporate governance is not a major concern.

6.4. *Is the Result Driven by the Change in Information Environment?*

Several studies have shown that enacting UD laws affects the corporate information environment. While Bourveau et al. (2018) find that UD laws incentivize managers to be more transparent and increase the quantity of voluntary disclosure, Boone et al. (2019) find that the

[25] Contrary to the finding in Appel (2019), Donelson et al. (2021) find no evidence that UD law affects corporate governance, suggesting that changes in corporate governance may not be a major concern.

increase in disclosure quantity coincides with a decrease in the quality of both voluntary and mandatory disclosure, leading to greater information asymmetry among analysts and in the trading environment. If the UD law adoption increases information asymmetry at the firm level, it would be more difficult for outside investors to monitor workplace safety, which explains the rise in injury rate. To ensure that changes in the information environment does not drive our result, we control for (a) the probability of informed trading (PIN), which is a widely used indicator of information asymmetry risk; (b) the transparency of a firm's annual report, i.e., the FOG index, and (c) analysts' coverage since Bradley et al. (2021) find that it affects workplace safety. The *PIN* measure is constructed following Brown et al. (2009). The *FOG* index is the Gunning Readability Index that is available from the WRDS SEC Analytics database. *Analyst Coverage* is the number of analyst earnings forecasts for a firm in a year. The result in Column (3) in Table 9 shows that the injury rate is not qualitatively affected by changes in the information environment that could be associated with the passage of UD laws. We note that Donelson et al. (2021) find no evidence that the UD law affects aggressive accounting and voluntary disclosure, suggesting that changes in the information environment may not be a major concern.

Finally, we run a regression with all the variables mentioned above and find that the coefficient estimate of the UD law indicator is not affected by controlling for these potential confounding effects simultaneously. The result is reported in Column (4) of Table 9.

[Please Insert Table 9 Here.]

6.5. *Reuse of Natural Experiment*

Heath et al. (2021) point out a problem of the reuse of natural experiments: when the same natural experiment is used as a treatment to test different hypotheses, the likelihood of false positives increases. Following their recommendation, we have previously justified the relevance

and exclusion restrictions for using UD laws as a natural experiment. Before our paper, the staggered adoption of UD laws was used as a natural experiment in about 25 papers (see Appendix 2 of Donelson et al. (2021)). Based on the simulations in Heath et al. (2021), the adjusted critical value of the t-statistic given 30 prior results for stagger adoptions of UD laws is about 3.1 (see Column 1, Panel A, Table A1 there). The vast majority of our results have surpassed this modified threshold for statistical significance, which corrects for multiple hypothesis testing.

6.6. Individual State-Level Evidence of the UD Law Effect

We have presented our main results for the whole sample in Table 3. As an additional step, we would like to re-examine the effect of UD laws on workplace safety for each of the states that adopted the UD law during our sample period. There are two primary purposes for this test. First, only seven states adopted a UD law during our sample period and have both pre- and post-event workplace injury data with sufficient observations in our sample. Because Delaware, the most popular state of incorporation, never passed a UD law, the observations from these seven states account for a small fraction of our total sample observations. This increases the chance that a particular outlier state may drive the average treatment effect such that the inference based on the average treatment effect may be misleading. By examining the treatment effect state by state, we can check if the passage of a UD law has similar treatment effects across states. Second, the UD law in Pennsylvania is mandated by the state supreme court, as noted in Appel (2019). Thus, its adoption is not a result of corporate lobbying and is free from any endogeneity concern of the UD law adoption. Hence, we want to see if the impact of UD law on workplace safety holds for firms incorporated in Pennsylvania in particular.

Table A4 in the Appendix presents the results from DiD regressions of the establishment-level total injury rate, *TCR*, on the UD law adoption at the individual state level. *UD Law (State of*

Incorporation) is an indicator variable that equals one if a firm is incorporated in a specific state that adopted a UD Law by the given year and zero otherwise. We include the same firm- and establishment-level control variables as in Column (4) of Table 3. Among the seven states that changed their UD law status with sufficient observations to conduct the research[23], the UD law has a negative effect on workplace safety in six states. The only exception is South Dakota (SD). However, since the UD law effect in SD is statistically insignificant, and a tiny number of observations are coming from this state, it does not constitute a major concern. Among the six states where the coefficient of the UD law indicator has the hypothesized sign, the coefficient estimate is statistically significant in four states: Connecticut, Pennsylvania, Iowa, and Massachusetts. The result for Pennsylvania alleviates the concern that the endogenous passage of UD laws drives the UD law effect.

6.7. *Alternative Injury Measures and Regression Models*

We further examine the relationship between the adoption of UD laws and workplace safety using alternative workplace injury measures and estimation models. The results are reported in Table A5 in the Appendix. In Columns (1) and (2) of Table A5 in the Appendix, we replace *TCR* with two alternative workplace injury measures that consider more serious injuries: *DART* (the Case Rate of Days Away, Restricted, or Transferred) and *DAFWII* (the Case Rate of Days Away from Work), and re-estimate our baseline regression. In addition, in Column (3) of Table A5, we use *TC* (total cases) as the dependent variable and estimate a Poisson model at the establishment level while controlling for the number of employees and the hours they worked. We continue to

[23] Although the states of Maine, Wyoming, Idaho, and Hawaii also adopted UD laws within our sample period, there are no or too few observations in our database.

find that adopting UD law compromises workplace safety in affected establishments relative to unaffected ones.

Overall, these robustness checks lend strong support to our main result that adopting UD law reduces workplace safety by lowering the threat of shareholder litigation.

6.8. *Further Discussions*

Recently, in response to the growing literature on the impact of UD laws on corporate disclosure practices and other actions, Donelson et al. (2021) cast doubts on whether the passage of UD laws materially reduces the number of derivative lawsuits thus, its impact on corporate actions.

Although shareholder derivative lawsuits are relatively rare and cases seldom go to trial, the *threat* of derivative litigation, not necessarily the number of realized court cases, can impact the way in which corporate decisions are made. As reported in Jost (1994), there were major lobbying activities in the state of New York in 1993 to enact the UD law from the corporate sector, including Jack Welch, the then Chairman of General Electric, one of the biggest employers in the state of New York. This episode suggests that the impact of UD laws on corporate actions is not negligible. Otherwise, the corporate sector may not waste valuable resources on lobbying. Our results should be interpreted as the impact of the perceived threat of litigation brought by the adoption of UD laws on corporate workplace safety investments.

Donelson et al. (2021) also show that UD law effects discovered in some other studies lose statistical significance once the sample period is extended past 2010 and includes the UD law changes made in Washington DC in 2011 and Louisiana in 2015. Their finding is unlikely to significantly impact our findings because our sample period ended in 2011, and the last UD law adoption in our sample occurred in 2005.

7. Conclusions

In this paper, we conduct a comprehensive study of the causal relationship between the threat of shareholder litigation and the level of workplace safety based on establishment-level injury data collected by OSHA from 1996 to 2011. Using the staggered adoption of the Universal Demand (UD) laws across US states as a plausibly exogenous shock to the perceived risk of shareholder litigation, we find that reducing the threat of shareholder litigation increases workplace injury rates. The impact is stronger for firms with weak governance, in less competitive, low union coverage, or low skilled industries. The impact is also stronger when institutional investors relax their monitoring due to exogenous distractions. We further show that a direct cause of the increase in injury rate is a decrease in safety inputs. Our results survive a battery of robustness checks.

Our finding that the threat of shareholder litigation can play an economically significant role in improving workplace safety has important implications for shareholders and policymakers. Recently, shareholders have been increasingly active in putting pressure on their portfolio firms to improve ES performance. While large institutional investors such as the "Big Three" can use their voting power to push for changes, this is typically not an option for smaller investors. Our finding suggests that smaller investors can potentially use the threat of litigation as a strategy to exert their influence on their portfolio firms. Our finding also contributes to the design of efficient regulatory and legal regimes for workplace safety for policymakers. Finally, OSHA may use our findings to allocate its inspection resources more efficiently. For example, they can spend more resources on firms that are more prone to neglect workplace safety and thus increase the overall compliance with OSHA standards under the same budget.

Appendix

Table A1

The Chronology of Universal Demand Laws Adoption

This table presents the chronology of adopting the Universal Demand laws by 24 states from 1989 to 2011. Source: Appel (2019)

Adoption Year	State
1989	GA
1989	MI
1990	FL
1991	WI
1992	MT
1992	UT
1992	VA
1993	MS
1993	NH
1995	NC
1996	AZ
1996	NE
1997	CT
1997	ME
1997	PA
1997	TX
1997	WY
1998	ID
2001	HI
2003	IA
2004	MA
2005	RI
2005	SD
2011	DC

Table A2
Injuries and Illnesses by Cause and Nature

This table presents the distribution of injuries and illnesses in the U.S. private sector in 2011 by cause (Panel A) and nature (Panel B). The percentages are based on the workplace incident rates from the BLS at https://www.bls.gov/news.release/archives/osh2_11082012.pdf.

Panel A: Injuries and Illnesses by Cause	
Cause of Injury and Illness	Percent
Contact with objects	29.30
Fall on same level	19.83
Overexertion in lifting/lowering	14.81
Violence and other injuries by persons or animal	7.95
Transportation incidents	6.32
Fall to lower level	6.10
Exposure to harmful substances or environments	5.23
Slips or trips without fall	5.23
Repetitive motion	3.70
Fires and explosions	0.22
All other events	1.31
Panel B: Injuries and Illnesses by Nature	
Nature of Injury and Illness	Percent
Sprains, strains, tears	38.44
Soreness, pain, including back	12.55
Bruises, contusions	8.83
Fractures	7.88
Cuts, lacerations	6.84
Multiple traumatic injuries and disorders	3.72
Heat (thermal) burns	1.30
Carpal tunnel syndrome	0.87
Amputations	0.43
Chemical burns	0.35
Tendonitis (other or unspecified)	0.26
All other natures	18.53

Table A3
Variable Definitions

Universal Demand Laws	
UD Law	An indicator variable that equals one if a firm is incorporated in a state that adopted a UD Law by the given year and zero otherwise.
Establishment Characteristics	
TCR	The number of injuries and illnesses over the number of hours worked by all employees at an establishment in a year and multiplied by 200,000. https://www.bls.gov/iif/osheval.htm.
DART	The number of injuries and illnesses resulting in days away from work and with job restriction or transfer over the number of hours worked by all employees at an establishment in a year and multiplied by 200,000.
DAFWII	The number of injuries and illnesses resulting in days away from work over the number of hours worked by all employees at an establishment in a year and multiplied by 200,000.
Total Case	The number of injuries and illnesses at an establishment in a year.
Ln(Number of Employees)	The natural logarithm of total number of employees at an establishment.
Hours Per Employee	The number of total annual hours worked at an establishment divided by the number of employees
Strike	An indicator variable that equals one if there was a strike/lockout in the establishment during the year and zero otherwise.
Shutdown	An indicator variable that equals one if there was a shutdown/layoff in the establishment during the year and zero otherwise.
Seasonal	An indicator variable that equals one if the establishment employs seasonal workers during the year and zero otherwise.
Disaster	An indicator variable that equals one if the establishment is affected by adverse weather conditions/natural disasters during the year and zero otherwise.
Union Membership	The percentage of union membership in an establishment's industry.
Skilled Labor	The level of industry-level occupation-weighted average of required skills of an establishment.
Violation	An indicator variable that equals one if the establishment has any safety violations under OSHA inspection during the year and zero otherwise.
Serious Violation	An indicator variable that equals one if the establishment has any fines-associated safety violations under OSHA inspection during the year and zero otherwise.
Firm Characteristics	
Ln(Assets)	The natural logarithm of book value of total assets.
Cash/Assets	The ratio of cash and short-term investment over total assets.
Leverage	The ratio of long-term and short-term debt over total assets.
PPE/Assets	The ratio of net property, plant, and equipment over total assets.
Sales/Assets	The ratio of total sales over total assets.

CapEx/Assets	The ratio of capital expenditures over total assets.
Market-to-Book	The ratio of market value of assets (the sum of market value of equity, book value of total liabilities, and liquidation value of preferred stock minus deferred tax liabilities) over book value of total assets.
ROA	The ratio of a firm's operating income over lagged total assets.
R&D/Assets	The ratio of research and development spending over lagged total assets.
Return Volatility	The variance of daily stock return in a year.
E Index	The count of six shareholder rights: classified board, limits to shareholder bylaw amendments, poison pill, golden parachute, supermajority requirements for mergers, and charter amendments (Bebchuk, Cohen, and Ferrell, 2009).
Institutional Ownership	The percentage of outstanding shares owned by institutions in a year.
Analyst Coverage	The number of analyst earnings forecasts for a firm in a year.
PIN	The probability of information-based trading. Data is from Stephen Brown.
FOG	Gunning Fog Readability Index is computed as 0.4((Number of words/Number of sentences) + 100(Number of complex words/ Number of words)). Data is from WRDS SEC Analytics.
Shareholder Distraction	The aggregated shareholder-level distraction score at the firm level, computed in Kempf et al. (2017).
Board Independence	The percentage of independent directors on the board in a year.
Product Similarity	The value of the product similarity index defined in Hoberg and Phillips (2016) at the firm level.
SGA/Employee	The ratio of selling, general, administrative expense over the number of employees.
Abnormal SGA/Employee	The residual from a regressions of the SG&A expenses divided by the beginning number of employees [$xsga_t/emp_{t-1}$] on the beginning sales divided by the beginning number of employees [$sale_{t-1}/emp_{t-1}$] and inverse beginning number of employees [$1/emp_{t-1}$] for each year and 2-digit sic industry, based on Caskey and Ozel (2017).

Table A4
Individual State Effects of Universal Demand Laws

This table presents results from difference-in-differences regressions of establishment incident rate on UD law adoption at the individual state level. *UD Law (State of Incorporation)* is an indicator variable that equals one if a firm is incorporated in a specific state that adopted a UD Law by the given year and zero otherwise. *TCR* is the number of injuries and illnesses over the number of hours worked by all employees at an establishment in a year and multiplied by 200,000. All columns include the same control variables as in Column (4) of Table 3. All variables are defined in Table A3. The sample consists of establishments in the ODI survey data for the period 1996–2011. The number of establishments affected by the adoption of UD laws for each individual state within the sample period is stated in the right Column. Robust standard errors are clustered at the state of incorporation level and are shown in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

Dependent Variable	TCR
	(1)
UD Law (CT)	0.917***
	(0.238)
UD Law (PA)	0.862***
	(0.292)
UD Law (TX)	0.729
	(0.487)
UD Law (IA)	1.036*
	(0.567)
UD Law (MA)	1.423***
	(0.138)
UD Law (RI)	0.806
	(1.348)
UD Law (SD)	-0.508
	(1.146)
Establishment FE	Y
Industry × Year FE	Y
State × Year FE	Y
Adjusted R^2	0.581
Observations	76,297

Table A5
Robustness: Alternative Measure and Model

This table presents results from difference-in-differences regressions of establishment incident rate on UD law adoption using alternative incident measures and a Poisson regression model. *UD Law* is an indicator variable that equals one if a firm is incorporated in a state that has adopted a UD Law and zero otherwise. *DART* is the number of injuries and illnesses with days away from work and with job restriction or transfer divided by the number of hours worked by all employees at an establishment in a year and multiplied by 200,000. *DAFWII* is the number of injuries and illnesses with days away from work divided by the number of hours worked by all employees at an establishment in a year and multiplied by 200,000. *Total Case* is the number of total injuries and illnesses at an establishment in a year. Columns (1)-(2) are the OLS regressions, while Column (3) is the Poisson regression. All columns include the same control variables as Column (4) of Table 3. All variables are defined in Table A3. The sample consists of establishments in the ODI survey data for the period 1996–2011. Robust standard errors are clustered at the state of incorporation level and are shown in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

	Alternative Measures		Alternative Model
Dependent Variable	DART	DAFWII	Total Case
	(1)	(2)	(3)
UD Law	0.832***	0.577**	0.097***
	(0.267)	(0.263)	(0.037)
Model	OLS	OLS	Poisson
Controls	Y	Y	Y
Establishment FE	Y	Y	Y
Industry × Year FE	Y	Y	Y
State × Year FE	Y	Y	Y
Adjusted (Pseudo) R^2	0.554	0.539	0.893
Observations	76,297	76,297	75,406

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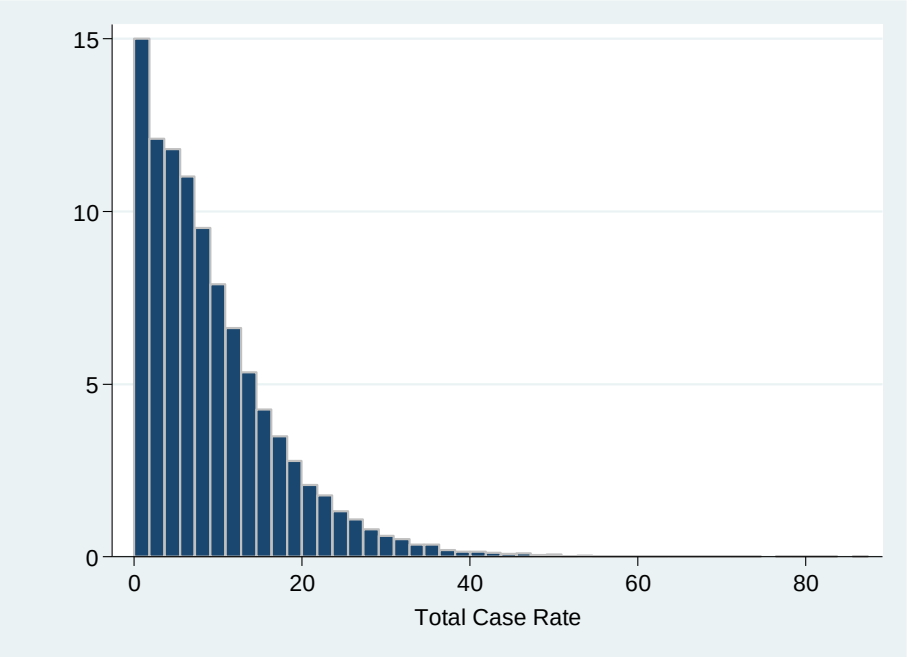
Figure 1
Distribution of Establishment-Level Total Case Rate (TCR)

Panel A presents the distribution of total case rate (TCR) for each establishment-year observation in our sample for the period 1996–2011. TCR equals the equivalent number of workplace incidents in a year for an establishment with 100 full-time workers working 40 hours per week for 50 weeks in a year.



Panel B presents the distribution of the average total case rate by Fama-French 48 industry codes for each establishment observation in our sample for the period 1996–2011.

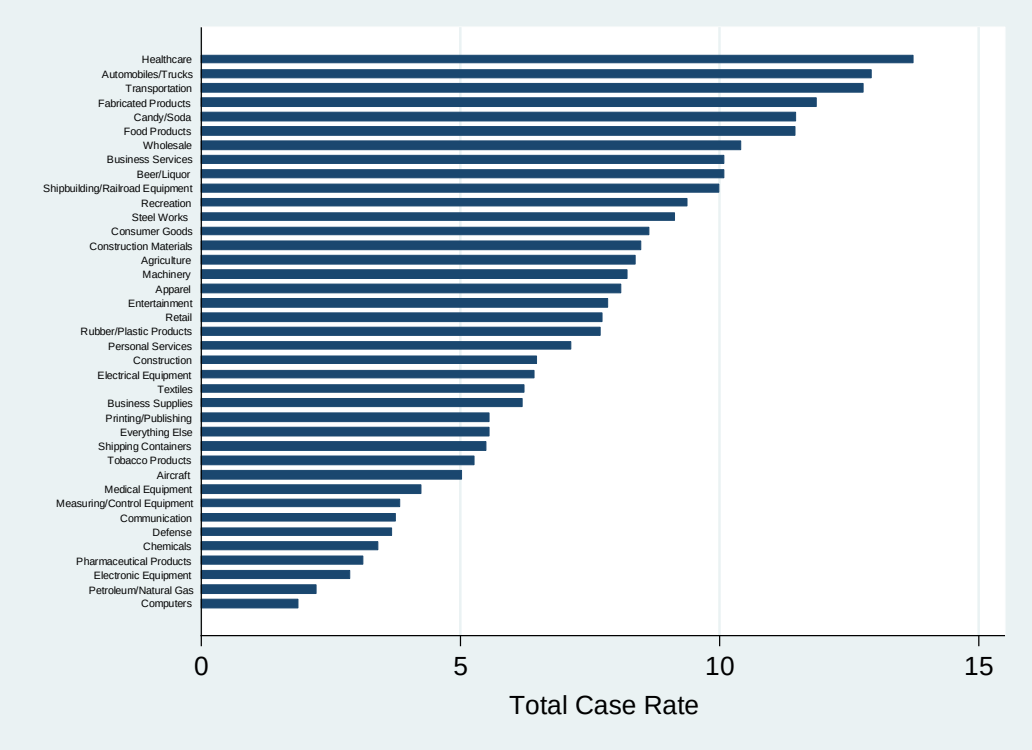
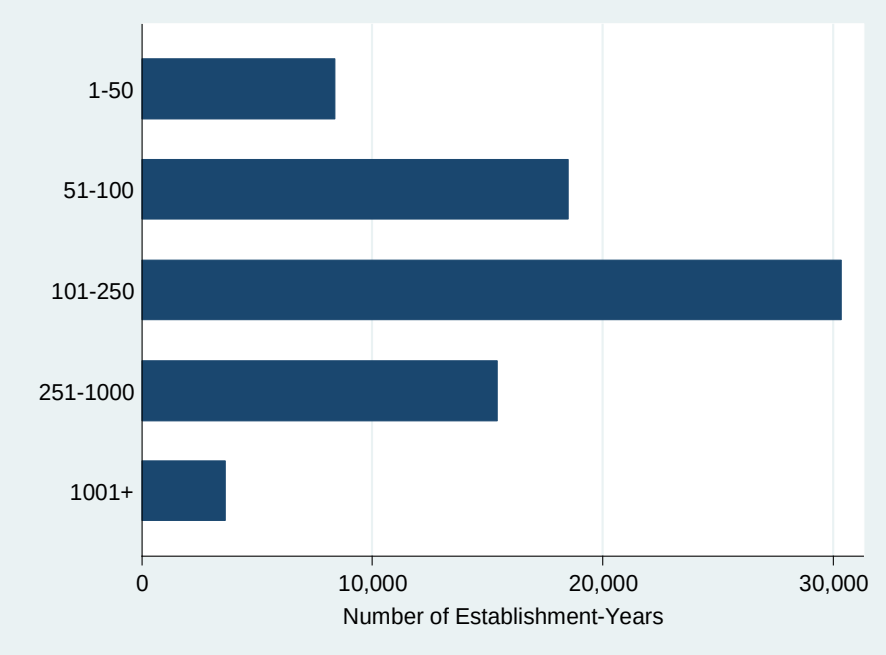


Figure 2
Distribution of Sample Establishments by Size and Industry

Panel A presents the distribution of establishments by the number of employees for each establishment observation in our sample for the period 1996–2011. Establishments are grouped into five bins by the number of employees: 1-50, 51-100, 101-250, 251-1000, and 1001+ employees, respectively.



Panel B presents the distribution of establishments by Fama-French 48 industry codes for each establishment observation in our sample for the period 1996–2011.

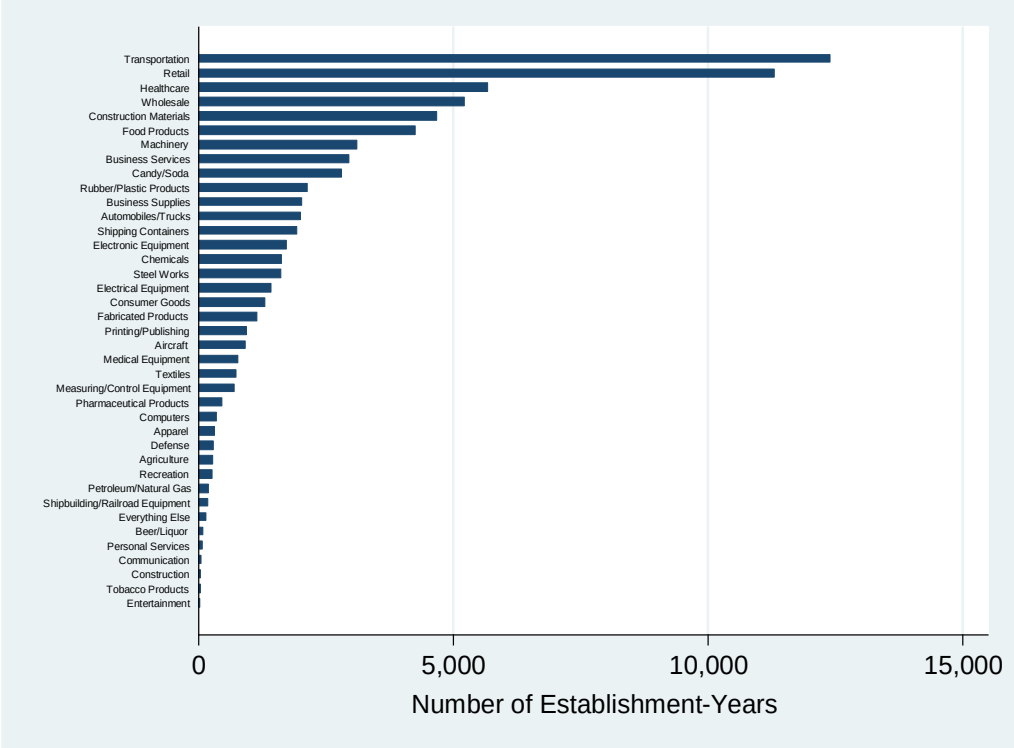


Figure 3. Dynamic Effects of Universal Demand Laws

This figure plots the dynamic effects of the UD law adoptions on establishment incident rate around the adoption from 1996 to 2011. The dashed lines refer to 95% confidence intervals of estimated coefficients. Specifically, we estimate the following model:

$$TCR_{i,j,l,k,s,t} = \beta_0 + \sum_{t=-2}^{t=+3+} \beta_t * UD\ Law_{k,t+n} + \gamma X_{j,t-1} + \delta Y_{i,t-1} + \theta_i + \mu_{lt} + \pi_{st} + \epsilon_{i,j,l,k,s,t}$$

$UD\ Law_{k,t+n}$ is an indicator variable that equals one for the *n*-th year relative to the UD law adoption year *t*. $UD\ Law_{-3-}$, which equals one for years that are three or more years before the year of UD law adoption, is excluded from the regression. $TCR_{i,j,l,k,s,t}$ is the total case rate for an establishment-year; $X_{j,t-1}$ is a vector of firm control variables, $Y_{i,t-1}$ is a vector of establishment control variables. θ_i is establishment fixed effects, μ_{lt} is establishment industry by year fixed effects, π_{st} is the establishment state by year fixed effects, and $\epsilon_{i,j,l,k,s,t}$ is the error term.

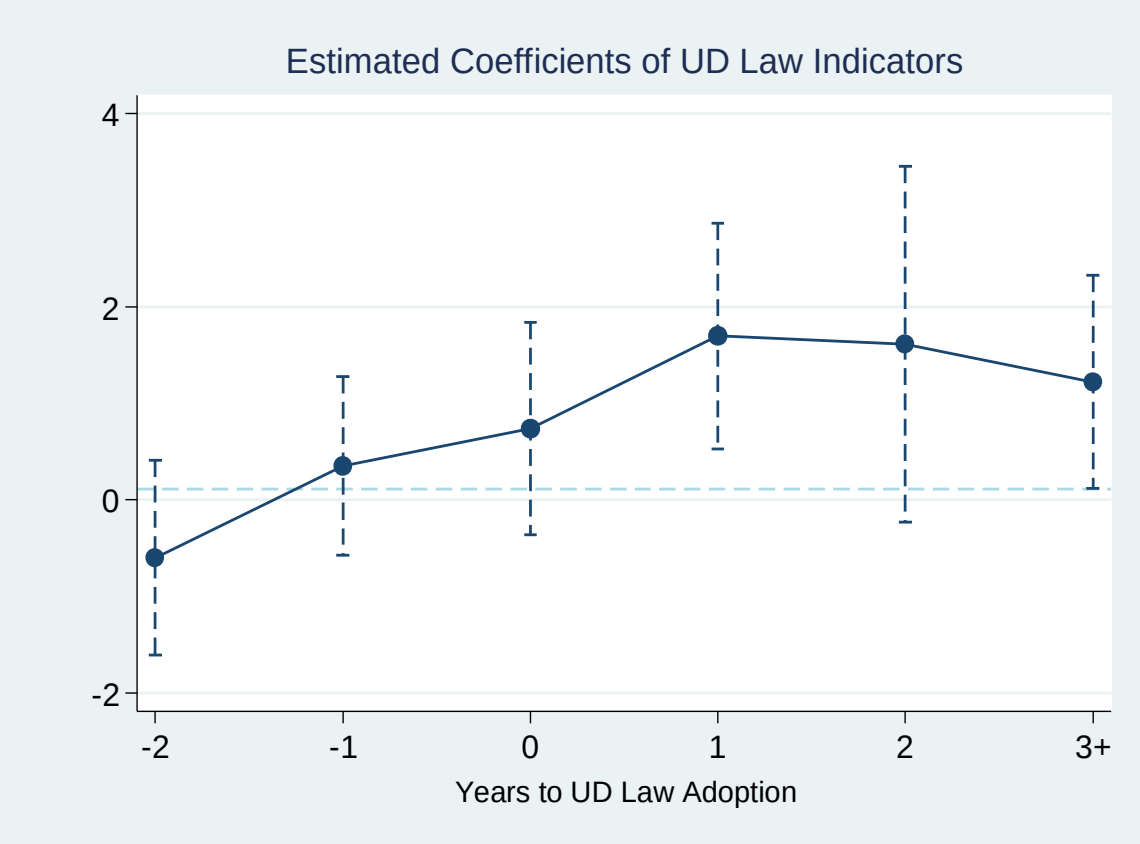


Table 1
Summary Statistics

This table displays summary statistics of establishment injury/illness rates and other establishment-level or firm-level characteristics. Establishment injury/illness data are from the OSHA ODI database between 1996 and 2011. Accounting data are from the Compustat database. All continuous variables are winsorized at 1% and 99%. All variables are defined in Table A3.

Variable	N	Mean	S.D.	25%	Median	75%
Establishment Characteristics						
TCR	76297	9.387	8.528	3.330	7.298	13.053
DART	76297	5.869	5.858	1.491	4.259	8.496
DAFWII	76297	2.845	3.747	0.182	1.558	3.847
Number of Employees (000s)	76297	0.275	0.479	0.088	0.135	0.250
Ln(Number of Employees)	76297	2.180	0.426	1.903	2.130	2.398
Hours Per Employee (000s)	76297	1.947	0.324	1.765	1.994	2.123
Strike	76297	0.002	0.050	0.000	0.000	0.000
Shutdown	76297	0.076	0.264	0.000	0.000	0.000
Seasonal	76297	0.029	0.169	0.000	0.000	0.000
Disaster	76297	0.005	0.072	0.000	0.000	0.000
Firm Characteristics						
Ln(Assets)	9272	6.686	2.016	5.348	6.651	7.978
Cash/Assets	9272	0.108	0.140	0.018	0.055	0.141
Leverage	9272	0.255	0.245	0.102	0.231	0.358
PPE/Assets	9272	0.292	0.180	0.153	0.258	0.397
Sales/Assets	9272	1.302	0.713	0.834	1.151	1.603
CapEx/Assets	9272	0.058	0.054	0.024	0.042	0.074
Market-to-Book	9272	1.714	1.012	1.094	1.407	1.964

Table 2
Validity Tests: The Timing of Adopting Universal Demand Laws

This table presents the results from Weibull hazard models where the "failure" event is enacting UD law by a state in a year. The dependent variable is the natural logarithm of the number of years to the adoption of UD law. The sample is at the state of incorporation level, and a state is dropped from the sample once it adopted UD law, which occurred to 24 states before or during the 1996-2011 period. Our main explanatory variable is *State Injury Rate* at the state of incorporation level and computed from both the OSHA ODI survey and BLS SOII survey. *State Real GDP* is the annual inflation-adjusted GDP in a state. *State GDP Growth* is the annual GDP growth rate in a state. *State Unemployment Rate* is the annual unemployment rate in a state. *State HPI Change* is the annual housing price index change in a state. *State Stock Return* is the annualized value-weighted monthly stock returns of all firms incorporated in a state. *Ln(Number of Firms)* is the logarithm of the annual number of Compustat firms in a state. *State Republican Governor* is an indicator variable if a state has a Republican governor in a year. *State Median Income* is the annual household median income in a state. Robust standard errors are clustered at the state of incorporation level and are shown in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

	OSHA ODI Survey		BLS SOII Survey	
Dependent Variable	Ln(Number of years to adopting UD law)			
	(1)	(2)	(3)	(4)
State Injury Rate	-0.002	-0.003	-0.029	-0.001
	(0.005)	(0.004)	(0.357)	(0.358)
State Real GDP		-0.005		-0.005
		(0.004)		(0.005)
State GDP Growth		-0.029		-0.051
		(0.042)		(0.060)
State Unemployment Rate		0.066		0.006
		(0.289)		(0.326)
State HPI Change		0.031		0.031
		(0.035)		(0.045)
State Stock Return		-0.482		-0.396
		(0.314)		(0.245)
Ln(Number of Firms)		0.072		0.266
		(0.380)		(0.466)
State Republican Governor		1.013*		0.755
		(0.560)		(0.715)
State Median Income		0.000		0.000
		(0.000)		(0.000)
Observations	439	439	393	393

Table 3
Universal Demand Laws and Workplace Safety

This table presents results from difference-in-differences regressions of establishment incident rate on UD law adoption. *UD Law* is an indicator variable that equals one if a firm is incorporated in a state that adopted a UD Law by the given year and zero otherwise. *TCR* is the number of injuries and illnesses over the number of hours worked by all employees at an establishment in a year and multiplied by 200,000. All variables are defined in Table A3. The sample consists of establishments in the ODI survey data for the period 1996–2011. Robust standard errors are clustered at the state of incorporation level and are shown in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

Dependent Variable	TCR			
	(1)	(2)	(3)	(4)
UD Law	1.167***	0.980***	0.898***	0.922***
	(0.247)	(0.222)	(0.230)	(0.216)
Ln(Number of Employees)			-0.447	-0.354
			(0.456)	(0.372)
Hours Per Employee			-0.003***	-0.003***
			(0.000)	(0.000)
Strike			1.447**	1.418**
			(0.542)	(0.548)
Shutdown			0.186	0.198
			(0.127)	(0.123)
Seasonal			0.141	0.141
			(0.173)	(0.165)
Disaster			0.495**	0.464**
			(0.240)	(0.225)
Ln(Assets)				-0.365
				(0.384)
Cash/Assets				1.536
				(1.491)
Leverage				0.986
				(0.987)
PPE/Assets				-4.215**
				(2.076)
Sales/Assets				-0.385
				(0.347)
CapEx/Assets				-1.355
				(1.357)
Market-to-Book				-0.224
				(0.224)
Establishment FE	Y	Y	Y	Y
Industry × Year FE	Y	Y	Y	Y
State × Year FE	N	Y	Y	Y
Adjusted R^2	0.571	0.574	0.580	0.581
Observations	76,297	76,297	76,297	76,297

Table 4
Dynamic Effects of Universal Demand Laws

This table presents results from dynamic difference-in-differences regressions of establishment injury rate on UD law adoption. *UD Law*$_n$ is an indicator equal to one for the *n-th* year relative to the year of UD law adoption and zero otherwise. For example, *UD Law*$_{+3+}$ equals one for the third year and beyond the year of UD law adoption and zero otherwise. *UD Law*$_{-3-}$, which equals one for years that are three or more years before the year of UD law adoption, is excluded from the regression. *TCR* is the number of injuries and illnesses over the number of hours worked by all employees at an establishment in a year and multiplied by 200,000. Column (2) includes the same control variables as in Column (4) of Table 3. All variables are defined in Table A3. The sample consists of establishments in the ODI survey data for the period 1996–2011. Robust standard errors are clustered at the state of incorporation level and are shown in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

Dependent Variable	TCR	
	(1)	(2)
UD Law -2	-0.848	-0.598
	(0.549)	(0.513)
UD Law -1	0.432	0.354
	(0.526)	(0.473)
UD Law 0	0.600	0.739
	(0.460)	(0.562)
UD Law +1	1.741**	1.699***
	(0.644)	(0.596)
UD Law +2	1.432	1.614*
	(0.982)	(0.942)
UD Law +3+	1.277**	1.223**
	(0.584)	(0.563)
Controls	N	Y
Establishment FE	Y	Y
Industry × Year FE	Y	Y
State × Year FE	Y	Y
Adjusted R^2	0.574	0.581
Observations	76,297	76,297

Table 5
Governance and Workplace Safety

This table presents results from difference-in-differences regressions of establishment incident rate on UD law adoption conditional on governance metrics. *UD Law* is an indicator variable that equals one if a firm is incorporated in a state that adopted a UD Law by the given year and zero otherwise. *TCR* is the number of injuries and illnesses over the number of hours worked by all employees at an establishment in a year and multiplied by 200,000. *Institutional Ownership* is the percentage of outstanding shares owned by institutions in a year. *Shareholder Distraction* is the level of aggregated shareholder-level distraction score in a year, computed in Kempf et al. (2017). *Board Independence* is the percentage of independent directors on the board in a year. *Product Similarity* is a firm's product similarity index relative to its competitors (Hoberg and Phillips, 2016). *High (Low)* subsample is above (below) the top tercile of a year. All columns include the same control variables as Column (4) of Table 3. All variables are defined in Table A3. The sample consists of establishments in the ODI survey data for the period 1996–2011. Robust standard errors are clustered at the state of incorporation level and are shown in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

Governance Variable	Institutional Ownership		Shareholder Distraction		Board Independence		Product Similarity	
	High	Low	High	Low	High	Low	High	Low
Dependent Variable	TCR							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
UD Law	0.501	1.868***	2.761**	0.044	0.996	1.658**	0.333	0.737**
	(0.318)	(0.678)	(1.152)	(0.385)	(0.965)	(0.679)	(0.761)	(0.273)
Controls	Y	Y	Y	Y	Y	Y	Y	Y
Establishment FE	Y	Y	Y	Y	Y	Y	Y	Y
Industry × Year FE	Y	Y	Y	Y	Y	Y	Y	Y
State × Year FE	Y	Y	Y	Y	Y	Y	Y	Y
Adjusted R^2	0.593	0.607	0.624	0.606	0.613	0.605	0.585	0.602
Observations	19,634	47,132	22,139	32,832	16,009	34,463	21,626	50,784

Table 6
Labor Constraints and Workplace Safety

This table presents results from difference-in-differences regressions of establishment incident rate on UD law adoption conditional on union power and labor skill. *UD Law* is an indicator variable that equals one if a firm is incorporated in a state that adopted a UD Law by the given year and zero otherwise. *TCR* is the number of injuries and illnesses over the number of hours worked by all employees at an establishment in a year and multiplied by 200,000. *Union Membership* is the percentage of workers who are unionized in an industry in a year. *Skilled Labor* is the level of an industry-level occupation-weighted average of required skills of an establishment in a year. *High (Low)* group is above (below) the top tercile of an industry-year. All columns include the same control variables as Column (4) of Table 3. All variables are defined in Table A3. The sample consists of establishments in the ODI survey data for the period 1996–2011. Robust standard errors are clustered at the state of incorporation level and are shown in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

Labor Variable	Union Membership		Skilled Labor	
	High	Low	High	Low
Dependent Variable	TCR			
	(1)	(2)	(3)	(4)
UD Law	-0.249	1.257**	0.358	1.919***
	(1.275)	(0.484)	(0.252)	(0.551)
Controls	Y	Y	Y	Y
Establishment FE	Y	Y	Y	Y
Industry × Year FE	Y	Y	Y	Y
State × Year FE	Y	Y	Y	Y
Adjusted R^2	0.615	0.585	0.648	0.571
Observations	25,177	46,753	23,652	48,761

Table 7
Universal Demand Laws and OSHA Safety Violations

This table presents results from difference-in-differences regressions of OSHA inspected violation incidences on UD law adoption. *UD Law* is an indicator variable that equals one if a firm is incorporated in a state that has adopted a UD Law and zero otherwise. *Violation* is an indicator variable that equals one if an establishment has any safety violations under OSHA inspection during the year, zero otherwise. *Serious Violation* is an indicator variable that equals one if an establishment has any fines-associated safety violations under OSHA inspection during the year, zero otherwise. All variables are defined in Table A3. The sample consists of establishments in the OSHA Enforcement database for the period 1996–2011. Robust standard errors are clustered at the state of incorporation level and are shown in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

Dependent Variable	Violation (0/1)	Serious Violation (0/1)
	(1)	(2)
UD Law	0.178**	0.171**
	(0.085)	(0.073)
Ln(Number of Employees)	0.002	0.013***
	(0.002)	(0.002)
Unionized Establishment	0.020*	0.014
	(0.011)	(0.017)
Ln(Assets)	-0.001	-0.022
	(0.026)	(0.021)
Cash/Assets	-0.114*	-0.187**
	(0.059)	(0.078)
Leverage	0.145**	0.192***
	(0.056)	(0.053)
PPE/Assets	-0.018	-0.177***
	(0.078)	(0.054)
Sales/Assets	0.000	0.035**
	(0.024)	(0.015)
CapEx/Assets	-0.066	0.035
	(0.108)	(0.100)
Market-to-Book	-0.005	-0.004
	(0.011)	(0.011)
Firm FE	Y	Y
Industry × Year FE	Y	Y
State × Year FE	Y	Y
Adjusted R^2	0.085	0.132
Observations	10,221	10,221

Table 8
Universal Demand Laws and Safety Investments

This table presents results from difference-in-differences regressions of firm safety expenses on UD law adoption. *UD Law* is an indicator variable that equals one if a firm is incorporated in a state that adopted a UD Law by the given year and zero otherwise. *SGA/Employee* is the selling, general and administrative expense divided by the number of employees in a firm. *Abnormal SGA/Employee* is the residual from regressions of the SG&A expenses divided by the beginning number of employees on the beginning sales divided by the beginning number of employees and inverse beginning number of employees for each year and 2-digit sic industry. All columns include the same firm-level control variables as Column (4) of Table 3. All variables are defined in Table A3. The sample consists of parent firms of establishments in the ODI survey data for the period 1996–2011. Robust standard errors are clustered at the state of incorporation level and are shown in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

Dependent Variable	SGA/Employee	Abnormal SGA/Employee
	(1)	(2)
UD Law	-6.829**	-4.423**
	(3.142)	(1.949)
Controls	Y	Y
Firm FE	Y	Y
Industry × Year FE	Y	Y
State × Year FE	Y	Y
Adjusted R^2	0.642	0.829
Observations	8,243	8,123

Table 9

Controlling for Profitability, Risk-taking, Governance, and Information Environment

This table presents results from difference-in-differences regressions of establishment incident rate on UD law adoption controlling for other simultaneous changes. *UD Law* is an indicator variable that equals one if a firm is incorporated in a state that adopted a UD Law by the given year and zero otherwise. *TCR* is the number of injuries and illnesses over the number of hours worked by all employees at an establishment in a year and multiplied by 200,000. All columns include the same control variables as in Column (4) of Table 3. All variables are defined in Table A3. The sample consists of establishments in the ODI survey data for the period 1996–2011. Robust standard errors are clustered at the state of incorporation level and are shown in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

	Profitability	Risk-taking	Governance	Information Environment	All
Dependent Variable			TCR		
	(1)	(2)	(3)	(4)	(5)
UD Law	0.904***	0.737**	1.126***	1.169***	0.973**
	(0.221)	(0.278)	(0.369)	(0.271)	(0.474)
ROA	-1.300				0.186
	(1.340)				(1.707)
R&D/Assets		-6.672			-9.785
		(9.809)			(6.875)
Return Volatility		-5.946			-42.306**
		(10.610)			(19.064)
E Index			-0.456***		-0.475**
			(0.151)		(0.199)
Institutional Ownership			-1.046*		-2.266***
			(0.526)		(0.545)
Analyst Coverage				-0.027	-0.009
				(0.018)	(0.022)
PIN				-1.599	-0.890
				(2.037)	(2.390)
FOG				0.008	0.006
				(0.043)	(0.043)
Controls	Y	Y	Y	Y	Y
Establishment FE	Y	Y	Y	Y	Y
Industry × Year FE	Y	Y	Y	Y	Y
State × Year FE	Y	Y	Y	Y	Y
Adjusted R^2	0.581	0.592	0.612	0.602	0.621
Observations	76,297	68,767	48,456	58,100	40,907