Financing and Workplace Safety*

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Abstract

We present evidence that financing frictions adversely impact investment in workplace safety, with implications for worker welfare and firm value. Using several identification strategies, we find that injury rates increase with leverage and negative cash flow shocks, and decrease with positive cash flow shocks. We then show that firm value decreases substantially with injury rates. Our findings suggest that investment in worker safety is another, economically important margin on which firms respond to financing constraints.
Workplace safety is a major determinant of employee well-being and has been studied extensively by researchers in areas as diverse as industrial relations, operations management, and industrial-organizational psychology. This paper examines the sensitivity of workplace injury risk to the availability of financial resources within a firm. This investigation is motivated by considerable evidence in the corporate finance literature that firms’ investment decisions can be highly sensitive to the availability of financial resources. Firms invest in workplace safety, just as they do in capital assets, research and development, inventory, and advertising, and this investment can have a significant impact on employee injury risk. Investment in safety may be especially vulnerable to cuts in the face of a financing constraint, as its payoffs are difficult to evaluate and accrue slowly over time. Financing constraints then could adversely impact workplace safety, with implications for worker welfare and firm value.

We study the effects of financial resources on workplace injury risk using establishment-level data from the Bureau of Labor Statistics’ (BLS’) Survey of Occupational Injuries and Illnesses (SOII). If financing constraints limit investment in workplace safety, then an increase in available financial resources (i.e., cash or external financing capacity) should lead to more investment in safety and hence fewer injuries. As we lack exogenous variation in financial resources with which to completely isolate this effect, we use a variety of empirical approaches, each of which provides evidence pointing towards more financial resources leading to fewer injuries. While any one piece of evidence is open to alternative interpretations, the evidence collectively is difficult to reconcile with any specific alternative.

We first examine the empirical relation between injury rates and firm-level determinants of capacity to finance investment, including cash flow, cash balances, and financial leverage. Cash balances and cash flow are sources of internal financing. Debt reduces cash flow through interest payments, and existing debt claims can make it difficult to raise additional external financial resources.

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1 According to Bureau of Labor Statistics estimates, 3.7 million workplace injuries and illnesses were reported in the U.S. in 2012. Leigh (2011) estimates the total annual cost of on-the-job injuries and illnesses in the U.S. at $250 billion, more than the cost of all forms of cancer combined.
capital (Myers [1977]). Prior research shows that investment in general tends to increase with available cash (e.g., Fazzari, Hubbard, and Petersen [1988], Lamont [1997], Rauh [2006]) and decrease with leverage (e.g., Denis and Denis [1993], Lang, Ofek, and Stulz [1996]). If investment in safety is sensitive to a firm’s financial resources, then injury rates should decrease with cash flow and cash balances and increase with leverage.

We find a robust positive relation between injury rates and leverage, controlling for establishment and firm characteristics as well as establishment, industry-year, and state-year fixed effects. A one standard deviation increase in a firm’s debt-to-assets ratio is associated with a 9.2 to 11.5 percentage point increase in workplace injuries the following year, larger than estimates of the impact of penalty-imposing OSHA inspections or plant unionization (Mendelhoff and Gray [2005]). This translates into 68.5 to 85.7 extra injuries in the average-sized firm in our sample. Injury rates are not related to future leverage, partly alleviating concerns about reverse causality.

In addition, the relation between injury rates and leverage is stronger when investment in safety is likely to have a bigger impact (when production depends more on physical assets). Injury rates are negatively related to cash balances in the cross-section but not in the time series within establishment, and there is no clear pattern in the relation between injury rates and cash flow. We also find some evidence that injury rates are related to characteristics such as dividend payout and firm size that may proxy for the severity of financing constraints. Overall, the results from this analysis provide some evidence consistent with injury rates being sensitive to financial resources, but this evidence is far from conclusive.

To better isolate the effect of financial resources on injury rates, we next study three quasi-natural experiments involving cash flow shocks. These include a repatriation tax holiday in 2004, the onset of the financial crisis in 2007-2008, and large oil price fluctuations during the 2000s. Variants of each have been used in prior papers to study the effect of cash flow
on capital investment.\footnote{Dharmapala, Foley, and Forbes (2011) and Faulkender and Petersen (2011) examine the effect of the repatriation tax holiday; Almeida, Campello, Laranjeira, and Weisbenner (2012) study the effect of the onset of the financial crisis, and Lamont (1997) studies the effect of an oil price shock in 1985.} The cash flow shocks involved are large, plausibly exogenous with respect to injury rates, uncorrelated with each other, and affect some firms but not others. We exploit this last feature to conduct difference-in-differences analysis, which mitigates though does not eliminate concerns about unobserved counterfactual changes in injury rates absent a shock. The results of these tests broadly support a negative (positive) response of injury rates to a positive (negative) cash flow shock, especially in firms with higher leverage. The estimates imply a reduction of 80.4 to 156.5 injuries in the average-sized firm following a one standard deviation increase in cash flow in a given year.

While the cash flow shocks involved are plausibly exogenous, identification of a treatment effect in a difference-in-differences setting also requires that assignment to treatment and control groups be as if random with respect to the outcome variable, conditional on observables. We attempt to mitigate concerns about non-random assignment by using matching to minimize differences in observable characteristics between treated and untreated establishments in each experiment. We also take steps to verify that the results are unlikely to be driven by differential pre-existing trends in injury rates. While we cannot rule out the possibility that unobserved factors correlated with future trends in injury risk impact assignment, they would have to do so in ways that coincidentally produce consistent results across three independent experiments in order to explain the results.

We also consider several mechanisms other than financing constraints that could produce a relation between injury rates and financial resources. These include mechanisms based on the existence of omitted characteristics, such as managerial skill or production technology, as well as reverse causality. It is difficult, however, to reconcile any of these explanations with the full range of results in the paper. The weight of the evidence then appears to favor financing constraints as the most likely mechanism.
Our results have important implications for optimal financing policy if firms bear substantial costs from increased injury risk. While there is evidence that firms bear costs through decreased productivity (Danna and Griffin [1999]) and compensating wage differentials (Pouliakas and Theodossiou [2013]), estimates of the overall effect of injuries on firm value are lacking. In the last part of the analysis, we show that firm value is negatively related to lagged injury rate, with a one-standard deviation increase in injury rates associated with a 6.1% decrease in firm value. This translates into a considerable though plausible fall in value of $466,746 per extra injured employee. While we cannot rule out alternative explanations for the relation, its magnitude is large enough to suggest that firms should consider consequences for future injury risk when setting financial policies, in line with the stakeholder theory of capital structure (Titman [1984]).

Our paper adds to a small set of papers examining the impact of financing on risks faced by non-financial stakeholders in a firm. Rose (1990) and Dionne, Gagné, Gagnon, and Vanasse (1997) find that the likelihood of serious accidents in the airline industry is negatively correlated with operating margins. Dionne, Gagné, Gagnon, and Vanasse (1997) find some evidence that leverage impacts the likelihood of airline accidents, but only for carriers with negative equity. Beard (1992) studies a small sample of trucking companies and finds that roadside inspection violations decrease in equity valuation. These studies are limited to small numbers of firms in specific industries and do not focus on employee safety. The closest work to ours is a study by Filer and Golbe (2003). They find that firms with more debt have fewer Occupational Safety and Health Administration (OSHA) safety violations, a conclusion seemingly at odds with ours. However, their sample is small and they do not control for establishment or firm fixed effects. Moreover, they measure inspection violations rather than actual injuries, and constrained firms may cut spending on safety in ways that affect injury risk but do not trigger OSHA violations.

Our paper also contributes to a small literature studying the effects of financing on
employee welfare more generally. Gordon (1998) shows that higher firm debt levels are associated with reductions in employment that are not fully attributable to performance.

Benmelech, Bergman, and Seru (2011) show that employment levels are sensitive to cash flow and that this sensitivity is greater for firms with higher leverage. Agrawal and Matsa (2013) present evidence that firms increase leverage in response to exogenous increases in unemployment benefits, suggesting that they at least partly internalize the cost of unemployment risk. Bronars and Deere (1991) and Matsa (2010) find that firms use financial leverage to gain bargaining power over their unions, suggesting that financing may impact employee wages. Ours is the first study we are aware of to provide evidence that financing impacts employee welfare through channels other than employment and compensation.

1 Financing Constraints and Workplace Safety

In this section, we discuss how firms invest in workplace safety and how financing constraints potentially impact this investment. This discussion is based largely on conversations with industrial safety practitioners and a case study on safety at Alcoa by Clark and Margolis (2000). We also discuss the ideal experiment for testing the impact of financing constraints on injury rates as well as the main challenge in approximating this ideal experiment with actual data.

1.1 Financial resources and investment in workplace safety

Workplace safety is instrumental to employee well-being. Poor safety conditions were a major driver of the spread of unions in the U.S. in the early 1900s and ultimately led to major labor reforms (Brody 1960). Yet many jobs remain inherently risky. Table 1 shows

\[\text{In other related papers, Bae, Kang, and Wang (2011) find that firms with more debt score lower on a third party rating of employee friendliness, and Brown and Matsa (2013) show that firms in financial distress have fewer and lower quality job applicants.}\]
the percentage of injuries in the U.S. in 2012 by different causes (Panel A) and types (Panel B) as reported in the BLS’s annual news release on employer-related workplace injuries and illnesses. The leading causes of workplace injuries are contact with objects, falls, and physical over-exertion, while the most common injury types are sprains, strains or tears, soreness and pain, bruises and contusions, cuts and lacerations, and fractures.

— Insert Table 1 here —

Firms invest in a number of different activities that reduce the risk of on-the-job injury. Some of these activities involve direct expenditures on the acquisition and upkeep of physical assets. These include maintaining existing equipment, replacing old and worn parts and machines, buying equipment with better safety features, and automating dangerous tasks. The physical assets involved can include both sophisticated machinery as well as simpler equipment. As an example of the latter, replacing steel cable used for hoisting objects with (more expensive) synthetic fiber cable can reduce injury risk by decreasing recoil and the incidence of sharp edges upon breakage.

Firms also expend considerable resources on less tangible activities that impact safety, including work flow organization, policies and procedures, training, and supervision. For example, lockout-tagout procedures prevent faulty machinery from being used until properly repaired. Alcoa introduced a forklift speed limit of four miles per hour on a production floor to reduce collisions (Clark and Margolis, 2000). While such a policy may seem mundane, the leading source of workplace injuries in 2012 was floors, walkways, and ground surfaces. Many plants establish safety committees to devise safety improvements. Perhaps the biggest innovation in safety management in the last few decades is the real-time, automated collection of data on a firm’s production processes, which expedites mitigation of potential hazards.

4Lockout-tagout procedures involve isolating and disabling power sources in dangerous machinery in a systematic, step-by-step way. Tagout procedures ensure that only specific employees can unlock and untag a machine, ensuring that malfunctioning equipment is not accidentally brought back online before it is repaired.

Like investment in physical assets, these organizational and policy activities consume financial resources. Allocating employee time to work on safety committees requires hiring more employees or paying overtime to maintain a given level of production. The same holds for training employees. Moreover, policies are only effective if they are actively enforced. Thus firms must devote time to monitoring and auditing to ensure that employees follow prescribed practices. In addition, practices such as lockout-tagout for broken equipment may lengthen the time that productive equipment is out of operation.

Systematic estimates of the amount that companies spend on workplace safety are not available, as companies do not generally track such spending. However, anecdotes suggest that this spending can be substantial. Patterson-UTI Drilling Co., an oil and gas drilling company, estimates that it spent $150 million on training and safety improvements between 2001 and 2010, 7% of its total income and 32% of its SG&A expense over the period. Following three fatal accidents at its Mission Valley Plant between 1971 and 1988, Alcoa spent $4 million making safety improvements in 1988 at that plant alone (Clark and Margolis, 2000). While these examples may not be representative, safety experts with whom we spoke indicated that safety-related expenditures at their companies are substantial.

While safety-related activities are implemented at the establishment level, they are driven by firm-level decisions through budgetary and policy initiatives. An establishment may cut spending on safety in order to meet short-run budgeted cost targets. Safety practitioners with whom we spoke repeatedly mentioned that budget constraints were an important impediment to implementing workplace safety measures. Anecdotally, the Chemical Safety Board (CSB) blamed a catastrophic explosion at BP’s Texas City Refinery in 2005 that killed 15 employees at least partly on an explicit decision not to replace a worn valve due to cost-cutting pressures. Firm-level policy initiatives include hiring safety consultants to

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7 Source: [http://www.csb.gov/assets/1/19/CSBFinalReportBP.pdf](http://www.csb.gov/assets/1/19/CSBFinalReportBP.pdf)
help improve safety practices, setting safety targets and holding managers accountable for achieving them, and implementing a safety culture.\(^8\)

A lack of financial resources at the firm level can impact both tangible and intangible investments in safety at the establishment level. Improved safety generates returns to a firm over time in the form of reduced downtime, increased productivity, fewer lawsuits, and a lower compensating wage differential. However, a financially constrained firm may turn down even positive NPV projects in order to conserve resources in the short run. The long-run nature of returns to investment in safety may make it especially vulnerable to cuts in the face of financing constraints.\(^9\) In this sense, a high level of workplace safety may be a luxury that a resource-constrained firm cannot afford. Moreover, serious workplace accidents are infrequent events, making the benefits of spending to improve safety difficult to quantify and hence to justify to investors.\(^10\)

1.2 Financing and workplace safety: the identification challenge

The ideal experiment for studying the effect of financing constraints on workplace safety would involve taking two identical firms, randomly shocking one with additional financial resources (e.g., cash or borrowing capacity), and then observing subsequent changes in injury rates in both. If financing constraints impede investment in safety, the injury rate should fall in the firm receiving the shock relative to the firm not receiving the shock. The main challenge in approximating this ideal experiment using actual data is that observed variation in financial resources is not exogenous, and firms with differing levels of resources are likely to differ on other dimensions, some of which are unobserved. This raises the concern that any


\(^9\)While regulatory safety inspections and penalties could force firms to bear more of the cost of workplace hazards in the short run, OSHA and its state affiliates inspected less than 1.2% of U.S. worksites in the U.S. in 2012, according to OSHA’s website. Firms with high safety standard may also cut spending on safety in ways that do not trigger formal violations of safety rules when financially constrained.

observed relation between measures of financial resources and injury rates could be driven by an omitted variable or reverse causality.

We consider four specific alternative mechanisms that could induce a negative relation between injury rates and measures of financial resources, similar to the effect that financing constraints should produce. First, employees working with heavy manufacturing equipment may face an especially high injury risk. This equipment also tends to make good collateral because of its redeployability. Firms using such equipment may therefore lever up, reducing cash flow and creating the appearance of low remaining borrowing capacity. Second, poor operational management can increase injury risk while also depleting financial resources. Third, a fast-growing firm may experience temporarily high injury rates due to employee inexperience or excess workloads, and growth tends to consume financial resources in the short run. The fourth mechanism is reverse causality. Costs associated with the actual incidence of injuries deplete financial resources.

Still other mechanisms could produce a positive relation between injury rates and financial resources. For example, the existential threat created by a persistent lack of financial resources may force a firm to operate with a high degree of efficiency, which could in turn lead to lower injury risk. This is consistent with Jensen’s (1986) argument that debt promotes operational efficiency by disciplining management. In addition, expenditures on safety consume resources in the short run, which could induce a quasi-mechanical positive relation between measures of financial resources and injury rates. These mechanisms would make the effects of financing constraints on injury rates more difficult to detect.

2 Data

In this section, we describe the data that we use in the paper. We also present summary statistics for our sample.
2.1 Description

Our data on workplace injuries comes from the BLS’s Survey of Occupational Injuries and Illnesses (SOII). Through a joint effort with OSHA, the BLS gathers data for hundreds of thousands of establishments each year in a stratified sampling process to produce aggregate statistics on the state of occupational risk in various industries in the U.S. Employers covered under the Occupational Safety and Health Act and employers selected to be part of the BLS survey are required to maintain a log recording any injuries “that result in death, loss of consciousness, days away from work, restricted work activity or job transfer, or medical treatment beyond first aid.” These employers must make their injury logs available to OSHA inspectors and supply the data contained in the log to the BLS.

Each establishment in the data has a unique identifier. Each establishment-year record contains establishment name, location, SIC code, number of injuries, number of injuries resulting in days away from work (“DAFW” injuries), average number of employees, and total number of hours worked. It also includes, for the period 2002-2009, the employer identification number (EIN) of the establishment’s parent company. We use the EIN to match the establishment level data to firm level data in Compustat. Thus our sample period is 2002-2009. Each firm in Compustat may contain multiple establishments.

We calculate several firm-level financial variables using the Compustat data. Debt/Assets is book debt (the sum of Compustat items dlc and dltt) divided by total assets (at). Cash/Assets is total cash and equivalents (ceq) divided by total assets. CashFlow/Assets is the sum of income before extraordinary items (ib) and depreciation and amortization (dp), divided by lagged total assets. Dividends/Assets is common dividends (dvc) divided by lagged total assets. Log(Assets) is the natural log of total book assets. AssetTurnover is total sales (sale) divided by lagged total book assets. MarketToBook is the market value of assets divided by total book assets. Market value is the sum of the market value of com-

\footnote{We obtain similar results throughout if we measure firm size using total sales or total employees.}
mon equity (the product of shares outstanding, \( cshpri \), and the firm’s stock price, \( prcc\_f \)), preferred stock (\( pstkl \)), and book debt, minus the book value of deferred taxes (\( txdb \)). We set the value of preferred stock or deferred taxes to zero if the relevant item is missing in Compustat. \( TangibleAssetRatio \) is net property, plant and equipment (\( ppent \)) divided by total book assets. \( Capex/Assets \) is capital expenditures (\( capx \)) divided by lagged total book assets. We winsorize all of these variables at the 1st and 99th percentiles to reduce the possible influence of outliers, and lag the balance sheet variables by one year.

### 2.2 Sample

We exclude from our sample any observations for which any of the firm-level Compustat variables described above is missing. We also exclude all establishments belonging to financial firms (SIC code 6000-6999) or regulated utilities (4900-4999) from our sample. This leaves us with a primary sample consisting of 43,721 establishment-year observations for 25,380 unique establishments, which belong to 2,251 unique firms. The median number of times an establishment appears in the sample is one, reflecting the fact that most establishments are sampled by the BLS only once during the sample period. However, 7,918 establishments appear multiple times in the sample, associated collectively with 25,053 establishment-year observations (3.16 per establishment). For this subsample, we can account for establishment fixed effects in our regression analysis.

Table 2 presents summary statistics for the sample. Panel A shows the number of establishment-level observations in the sample by year. The number of observations is fairly stable across years.

—— Insert Table 2 here ——

Panel B presents establishment-level summary statistics calculated from the BLS data. Consistent with the BLS’s confidentiality policy, we show only means and standard deviations.
and do not show statistics such as medians and individual percentiles that would present data for individual establishments. The average establishment in our sample has 353 employees, though this number varies widely across the sample. The average employee works 1,718 hours in a year, or approximately 43 forty-hour work-weeks. The average injury rate is 4.13%, in line with an average annual injury rate of 4.55% over our sample period as reported by the BLS in its aggregate statistics. Slightly less than one in three injuries results in days away from work. Panel C presents firm-level summary statistics for our sample. The mean values of the variables are in line with those for Compustat firms as a whole.

Table 3 shows a matrix of variable correlations. Overall, these correlations are modest. Only the correlation between Capex/Assets and TangibleAssetRatio exceeds 0.3 in absolute value. That this correlation is relatively high is unsurprising, as capital expenditures increment tangible assets by definition. The lack of strong correlations overall suggests that when we use these as explanatory variables in regressions, our estimates should not be excessively sensitive to small changes in the values of the variables.

— Insert Table 3 here —

An interesting and useful feature of the data is the identification of industry at the establishment level rather than the firm level. This allows us to assign each establishment a unique industry rather than pooling them over a coarse and potentially inapplicable firm-level industry classification. Table 4 shows injury rates (per hour worked and per average number of employees) for our sample across establishments in different industries. We define industries using the 48 industry classifications of Fama and French (1997), and assign each establishment to one of these industries based on its SIC code as reported in the BLS data. Two industries, Tobacco Products and Non-metallic and Industrial Metal Mining, are omitted because the relatively small number of establishments in our sample in these industries risks revealing the identity of individual establishments. Injury rates are highest in the
Candy & Soda, Fabricated Products, and Transportation industries. Not surprisingly, they are lowest in white collar industries such as Banking, Insurance, Trading, and Computers.\footnote{Note that Banking, Insurance, and Trading are largely excluded after we drop financial firms.}

Figure 1 shows the relative distribution of establishment size, which varies widely from a minimum size of ten full-time employees to well over 1,000 employees. Half of the establishments in the sample have fewer than 100 employees.

Figure 2 shows the distributions of injury counts and rates for the sample. Almost 30% of establishment-years in the sample have zero injuries. This is not surprising given the relatively low overall injury rate of 4.13% and the small size of many establishments.

To get a sense of the relative variation of injury occurrence in our sample, we report the between and within variation for three groupings. Table 5 shows the variance breakdown of injury rates grouped by establishment, firm, and industry.

One takeaway from this table is that injury rates are not simply an industry specific effect. They actually vary more within industry than across industry, though we note that our industry definitions are fairly coarse. As Table 4 shows, there is considerable variation across industries as well. Another takeaway is that, while there is more variation in injury rates across establishment than within establishment, there is considerable variation within establishment over time. The standard deviation of injuries per employee within establishment is 2.0% (vs. mean injuries per employee in the sample of 4.13%). This gives us power to identify the determinants of injuries even after controlling for establishment fixed effects.
3 Empirical determinants of injury rates

In this section, we present analysis of the drivers of workplace injury rates, with a focus on those relating to a firm’s ability to finance investment.

3.1 Estimation methodology

We rely primarily on multivariate regression analysis to explore the determinants of injury rates. We estimate three different types of empirical model. The injury data takes the form of count data, with a non-negative number of injuries (possibly zero) at each establishment in each year. We estimate two generalized linear count models: negative binomial and Poisson. The negative binomial, the more general of the two, is written:

\[ y_{it} \sim \text{Poisson}(\lambda_{it}^*) \]

\[ \lambda_{it}^* = \exp(x_{it}\beta + \text{exposure}_{it} + \epsilon_{it}) \]

\[ e^{\epsilon_{it}} \sim \text{Gamma}(1/\alpha, \alpha), \]

The dependent variable \( y_{it} \) is the number of injuries at establishment \( i \) in year \( t \). The Poisson model has the same form as the negative binomial model but restricts the mean and variance of the arrival rate to be equal - i.e., \( \lambda_{it} = \text{E}(\lambda_{it}) = \text{Var}(\lambda_{it}) \). Both models admit an exposure variable, which accounts for different durations of exposure to the underlying hazard in different establishment-years. We set \( \text{exposure}_{it} \) to the number of hours worked collectively at establishment \( i \) in year \( t \), as this is the natural measure of the collective exposure employees face to injury risk.

The third type of model we estimate is an OLS model, where the dependent variable is \( \text{InjuryRate}_{it} = \log[(\text{Injuries}_{it} + 1)/\text{Hours}_{it}] \). We log-transform the injury rate because of
the skewness of the injury distribution (see Figure 2). The OLS model takes the form:

\[ InjuryRate_{it} = \beta x_{it} + f_i + \epsilon_{it}. \]

Because the OLS dependent variable is log-transformed and the count models assume an exponential arrival rate, the coefficients from the three models can be compared.

Each of these three models has advantages and disadvantages. The negative binomial model is more efficient than the Poisson model when the mean and variance of the arrival rate are not equal. The Poisson model is less efficient in this case, but can accommodate fixed effects, which the negative binomial model cannot. That is, we can allow each establishment \( i \) to have a separate baseline injury rate:

\[ \lambda_{it} = \exp(\beta x_{it} + f_i + exposure_{it} + \epsilon_{it}). \]

It is important to note that a violation of the mean-variance equality assumption does not cause the Poisson model to produce biased estimates ([Wooldridge (2002), ch. 19]).

We generally control for industry-year and state-year dummies to account for time-varying industry factors such as technology and geographic factors such as unionization. However, the Poisson model fails to converge if we include both establishment fixed effects and industry-year dummies, and we are limited to industry dummies in this case (we continue to include state-year dummies, which account for year effects). OLS is the only model that can accommodate establishment, industry-year, and state-year fixed effects. However, OLS estimation using a log-transformed rate dependent variable can produce biased and inconsistent estimates, and the direction of the bias cannot signed a priori ([King, 1988]). As each of these models has different strengths and weaknesses, we rely on a combination of the three to learn about the determinants of injury rates.

The primary explanatory variables are \( Debt/Assets, CashFlow/Assets, \) and \( Cash/Assets. \)
If additional financial resources reduce injury rates, then injury rates should vary positively with Debt/Assets and negatively with CashFlow/Assets and Cash/Assets. We are also interested in the signs of the coefficients on Dividends/Assets and Log(Assets), as dividend payout and firm size have been used as proxies for the likelihood a firm is financially constrained (e.g., Fazzari, Hubbard, and Petersen (1988), Hadlock and Pierce (2010)).

Appendix A explores the statistical properties of the negative binomial, Poisson, and OLS estimators in our setting using simulations. It focuses on estimates of the relation between injuries and Debt/Assets, as this is the most robust relation we document in this section. Simulated injury data is generated using a negative binomial model to allow for differences in the mean and variance of the arrival process. The simulations confirm that Poisson estimates remain unbiased even if the the mean and variance of the arrival process differ. They also suggest that OLS estimates of the sensitivity of injury rates to Debt/Assets are likely to be biased downward (towards zero from the predicted relation) by 35% or more. A statistically significant positive OLS coefficient then would allow us to reject the null hypothesis that injury rates are unrelated to Debt/Assets.

3.2 Injury rate regression results

Table 6 presents results from estimation of the models just described. Standard errors adjusted for clustering at the firm level are shown in parentheses below each point estimate. The first four columns present results from negative binomial, Poisson, establishment fixed effects Poisson, and establishment fixed effects OLS models.

| Insert Table 6 here |

All four columns show a positive and statistically significant relation between injury rates and leverage, consistent with debt causing a reduction in safety-related investment. Because the simulations suggest that the OLS coefficient on Debt/Assets is likely to be downward
biased, we focus on the count models in assessing the implied economic magnitude of the relation. The expected percentage point change in injury count per unit change in an explanatory variable in the count models (first three columns) is given by $e^\beta - 1$, which ranges from 0.422 to 0.523 for Debt/Assets. A one standard deviation increase in Debt/Assets (0.219) then is associated with an 9.2 to 11.5 percentage point increase in expected injuries in the following year. This translates into 68.5 to 85.7 extra injuries the following year in the average firm in our sample based on an estimated mean of 745 injuries per firm-year.

The coefficient on Cash/Assets is negative in all of the count models but is only statistically significant in the negative binomial and non-fixed effects Poisson models. The coefficients from these two models imply that a one-standard deviation increase in cash balances is associated with a 6.0 to 6.9 percentage point decrease in injuries. The coefficient on CashFlow/Assets shows no clear pattern across the regressions. Providing some support for firms predicted to be more constrained on a priori measures investing less in safety, the coefficient on Dividends/Assets is negative and statistically significant in two of the four regressions and on Log(Assets) is negative and statistically significant in three of the four.

While the results do not provide overwhelming evidence that financing constraints result in higher injury rates, they are suggestive. The positive association of injury rates with leverage, in particular, appears robust to different models. Controlling for Capex/Assets and TangibleAssetRatio and industry dummies partly, though not fully, accounts for differences in growth and production technology across establishments. The inclusion of establishment, industry-year, and state-year fixed effects requires that any omitted variable driving the

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13 The difference in the OLS and establishment fixed effects Poisson model estimates is not due to the inclusion of only non-time varying industry dummies in the latter. The OLS estimates are virtually unchanged if we include non-time varying instead of time-varying industry fixed effects.

14 For perspective, the estimated effect is larger than existing estimates of the impact of either penalty-imposing OSHA inspections or plant unionization on injury rates (Mendelhoff and Gray, 2005).

15 This is calculated as the mean number of employees in our sample as reported by Compustat (16,739) times the mean annual U.S. injury rate per the BLS over our sample period (4.55 injuries per 100 employees). Note that we are implicitly assuming here that the sensitivity of injury rates to Debt/Assets in a firm’s establishments in the sample applies to other establishments owned by the firm that are not in our sample.
relationship be time-varying within establishment, and not purely through industry- or state-
level time variation. Ultimately, however, given the potentially endogenous nature of all of
the explanatory variables with respect to injury rates, we cannot draw strong conclusions
about causality from these regression results.

The positive coefficient on AssetTurnover is consistent with higher injury rates at “bus-
ier” firms (those that produce more per factor unit). The positive coefficient on TangibleAssetRatio
is consistent with higher injury rates when production relies more on physical assets. The
negative coefficient on Capex/Assets is consistent with injury rates declining as firms replace
old production equipment with newer equipment that must meet higher safety standards.
It could also be produced by tighter financing constraints leading to both fewer capital in-
vestments and less spending on safety. The negative coefficient on Log(employees) could
imply economies of scope in safety investment. The negative coefficient on Hours/Employee
could indicate that injury rates are higher when a firm has more part-time and temporary
employees, who are likely to have received less training than full-time employees.

In the final four columns of Table 6, we examine the determinants of DAFW and non-
DAFW injuries separately. Columns (5) and (6) show estimates from Poisson models and
columns (7) and (8) show estimates from OLS models using the log-transform of the relevant
rate (e.g., DAFW injuries per hour) as the dependent variable. The Poisson model coefficient
on Debt/Assets is approximately twice as large in the non-DAFW injury regression as in
the DAFW injury regression, and is only statistically significant in the former. This raises
questions about the economic importance of the results, as DAFW injuries are likely to be
more serious and costly than non-DAFW injuries. However, power may be an issue in the
DAFW injuries regression, as the median number of DAFW injuries in the sample is one,
and the number is zero 49% of the time. The OLS coefficients on Debt/Assets are similar
in magnitude in the DAFW and non-DAFW injury regressions, and both are statistically
significant at the five percent level.\footnote{16}

One cautionary note in interpreting the results of these regressions is that correlation among the explanatory variables combined with possible measurement error could produce biases. $\log(\text{Employees})$ and $\text{Hours/Employee}$ are most subject to this concern, as average employment and hours worked are self-reported by the establishments in the BLS survey and, unlike the firm-level variables, are unaudited. As Table 3 shows, these variables are somewhat correlated with a few of the firm-level variables (e.g., both have correlations with $\text{AssetTurnover}$ of greater than 0.2 in absolute value). However, they are fairly uncorrelated with $\text{Debt/Assets}$, $\text{Cash/Assets}$, and $\text{CashFlow/Assets}$ (no correlation greater than 0.086 in absolute value), the variables that most directly relate to financial resources.

### 3.3 Further analysis of the relation between injury rates and leverage

We further explore the apparent relation between injury rates and leverage in three ways. First, we examine the bi-variate relation between injury rates and leverage non-parametrically. Figure 3 shows a kernel-weighted local polynomial smooth of the bi-variate relation between $\text{Injuries/Hour}$ and $\text{Debt/Assets}$ using the epanechnikov kernel and a bandwidth of 0.1.

--- Insert Figure 3 here ---

Figure 3 shows that the injury rate at an establishment changes little with parent firm $\text{Debt/Assets}$ up a level of about 0.35, and then increases steadily with $\text{Debt/Assets}$ beyond this level. This is consistent with what one would expect if leverage imposes a potential

\footnote{16Even non-DAFW injuries can be serious. It is common to keep an employee working on restricted duty or reduced hours after an injury. Clark and Margolis (2000) document 13 specific accidents at Alcoa, of which only one (involving a broken hip) resulted in days away from work, even though others involved a fractured foot, fractured wrist, dislocated shoulder, second degree burns, and facial lacerations.}
constraint on investment in safety that only becomes binding beyond a certain point, as seems plausible. Note that, while the shape of this relation is intriguing, the kernel regression does not control for other variables that might alter this shape.

Second, we examine lead-lag patterns in the relation between injury rates and leverage by adding \( t + 1 \) (i.e., the following year’s) ending Debt/Assets to the first four regressions in Table 6 and re-estimating them. We refer to this variable as LeadDebt/Assets, and for clarity refer to \( t - 1 \) Debt/Assets as LaggedDebt/Assets. Table 7 shows the results.

— Insert Table 7 here —

Injury rates and prior year ending leverage continue to exhibit a strong and consistent positive relation. Even the OLS coefficient becomes statistically significant at the one percent level when we control for future leverage. We observe no relation between injury rates and next year’s ending leverage in these regressions. This partly addresses concerns about reverse causality. If a higher injury rate caused higher leverage, perhaps through its effect on financial performance, one would expect injury rates to lead leverage rather than the converse.

Finally, we consider differences in the nature of workplace safety across different industries. Discussions with industry safety experts suggest that firms have more control over injury risk in settings where production relies more on physical assets such as heavy machinery, as it is easier to identify and mitigate hazards due to improperly-functioning machinery than hazards due to the interaction of multiple employees. If this is the case, then limitations on the ability to finance investment in safety then should be more important in firms with more tangible assets. We test this hypothesis by estimating the fixed effects models in columns (3) and (4) of Table 6 separately for establishments in industries with above and below median TangibleAssetRatio (0.276). Table 8 presents the results.

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17 Ideally, we would construct measures based only on the representation of physical production equipment in a firm’s asset base and exclude other forms of tangible assets such as buildings and land. However, Compustat stopped reporting the breakdown of property, plant, and equipment in the mid-1990s.
Consistent with the argument, an establishment’s injury rate is much more sensitive to Debt/Assets if it is in an industry characterized by high asset tangibility. This does not necessarily help to rule out any specific alternative explanation for the relation between injury rates and leverage, but does provide further support for the financing constraints explanation. One concern with this test is that injuries might simply be less common in low-asset tangibility industries, giving our tests less power in these industries. However, the mean injuries per hour (times 1,000) of 0.036 in low-asset tangibility industries is only slightly smaller than the mean of 0.043 in high-asset tangibility industries. Leverage is also fairly similar between the two groups, with mean Debt/Assets in high- and low-asset tangibility industries of 0.233 and 0.222, respectively.

4 Injury Rates and Cash Flow - Three Quasi-Natural Experiments

In this section, we further explore the effect of financing constraints on injury rates using three quasi-natural experiments involving cash flow shocks. The first quasi-natural experiment exploits a provision in the American Jobs Creation Act (AJCA) of 2004 allowing firms to pay a tax rate of 5.25% on repatriated foreign income on a one-time basis instead of the standard corporate tax rate of 35%. This shock represented a significant windfall for the domestic coffers of firms with profitable foreign subsidiaries. Firms collectively repatriated $312 billion in response to the AJCA according to IRS estimates. Dharmapala, Foley.

\footnote{The larger number of observations for establishments with above median industry asset tangibility is consistent with the BLS injury survey oversampling establishments in industries with more physical production processes. We obtain similar results if we split the sample so that the number of establishments in high- and low-asset tangibility industries is similar. We also obtain similar results if we use parent firm-level variation in asset tangibility to split the sample.}
and Forbes (2011) and Faulkender and Petersen (2011) study the effects of this shock on investment levels in general.

The second experiment exploits the maturity structure of firms’ debt at the onset of the financial crisis in late 2007. Credit markets seized up in the U.S. starting in August 2007 and remained tight through 2008, making it difficult for firms to roll over maturing debt. A firm with a lot of debt maturing during this period effectively faced a negative cash flow shock. A firm’s maturity structure as of the beginning of the crisis is plausibly exogenous with respect to factors that might affect injury risk, as it was unlikely that firms anticipated the crisis when setting maturity schedules in the preceding years. Almeida, Campello, Laranjeira, and Weisbenner (2012) study the effect of this shock on investment levels in 2008.

The third experiment exploits substantial fluctuations in oil prices during our sample period. Higher oil prices increase the cash flow generated by oil producers. Because firms can reallocate capital internally, this increases the cash flow available to any non-oil establishments owned by oil producers. Assuming that oil price movements do not impact these non-oil establishments for other reasons, these shocks can be treated as exogenous with respect to injury rates in these non-oil establishments. Following this logic, Lamont (1997) studies the effect of a 1985 drop in oil prices on investment.

One useful feature of the three experiments is that they differentially impacted different groups of firms. The AJCA represented a cash flow shock only for firms with previously unrepatriated foreign profits. The financial crisis represented a larger shock for firms with high levels of debt maturing in 2008 than for firms with less maturing debt in 2008. Oil price movements only impact cash flow available via internal capital markets for establishments of firms with oil-producing subsidiaries. We exploit these differences in impact to conduct difference-in-differences analysis, comparing changes in injury rates at establishments.

\[^{19}\] Oil prices increased from around $25 per barrel in 2002 to over $130 per barrel in 2008, before falling to the $40s in 2009.
ments of firms experiencing a shock ("treated" establishments) with those not experiencing the shock ("untreated" establishments) in response to "treatment" (i.e., the shock).

For the AJCA experiment, we restrict the sample to the two years before and after implementation of the AJCA (2002-2003 and 2005-2006) to focus on changes right around the shock. Treatment is captured by Post04, which is one for observations in 2005 and 2006 (i.e., post-treatment) and zero for observations in 2002 and 2003. Exposure to treatment is captured by PosFP, which is one if the sum of an establishment’s parent firm’s foreign profits (Compustat variable pifo) from 2001 through 2003 is positive and zero otherwise.\(^{20}\)

For the financial crisis experiment, we restrict the sample to 2006-2008 to focus on the period right around the onset of the crisis.\(^{21}\) Treatment is captured by Crisis, which is one for observations in 2008 (i.e., post-treatment) and zero for observations in 2006 and 2007. Following the approach of Almeida, Campello, Laranjeira, and Weisbenner (2012), we constrain our sample to firms with 2007 fiscal year ends between September 2007 and January 2008, as firms with earlier 2007 fiscal year ends could have altered their maturity structures before the crisis began.\(^{22}\) For each firm, we define DebtDueIn1Year/Assets as debt maturing within one year (Compustat dd1) as of fiscal year end 2007 divided by total assets. Exposure to treatment is captured by HighDebtDue, which is one if the parent firm’s DebtDueIn1Year/Assets is at or above the 75th percentile for the sample (0.0304) and zero otherwise. This cutoff is arbitrary, but the results are not sensitive to the choice of cutoff.

Unlike the other two experiments, treatment in the oil experiment is not a discrete event, as oil prices move throughout the sample period. Treatment is captured by OilPrice, the

\(^{20}\)We choose a three-year window because it is long enough to reliably measure recent foreign profitability while avoiding foreign profits from the distant past that may no longer reside in a foreign subsidiary. Our results are robust to alternative windows for cumulating foreign profits. Establishments for which PosFP = 0 include establishments of firms with foreign losses over the 2001-2003 period and those with no foreign subsidiaries, with approximately 95% being comprised of the latter. We obtain similar results in our tests if we exclude firms with foreign losses over 2001-2003 from our sample.

\(^{21}\)We obtain similar results if we extend the sample period back to include 2005.

\(^{22}\)Approximately 80% of firms have 2007 fiscal year ends between September 2007 and January 2008.
natural log of the average oil price in a given year as reported by the US Energy Information Agency. Exposure to treatment is captured by $OilExposed$, which is one if an establishment’s parent firm is involved in oil and gas extraction and zero otherwise. We classify a firm as being in the oil and gas extraction business if it either has an establishment in 2-digit SIC code 13 (Oil and Gas Extraction) in the SOII at any time during the sample period or is classified by Capital IQ as being in the oil, gas, and consumable fuels business, excluding coal mining. We then remove establishments with a 2-digit SIC code 13 from the sample.

We implement difference-in-differences tests in each experiment using establishment fixed effects Poisson and OLS models. The Poisson models are specified generally as:

$$\lambda_{it} = \exp(\beta Treated_{it} \ast Treatment_{it} + f_i + Controls + \epsilon_{it})$$

while the OLS models are specified as:

$$InjuryRate_{it} = \beta Treated_{it} \ast Treatment_{it} + f_i + Controls + \epsilon_{it}.$$ 

We control for the variables in Table 6 as well as industry-year and state-year dummies in all of the regressions. Controlling for state-year dummies is especially important in the oil experiment, as the non-oil establishments of oil firms tend to be concentrated in oil-producing states such as Texas. In each regression, the coefficient on the interaction of $Treated$ and $Treatment$ captures the differential variation in injury rates with treatment for treated vs. untreated establishments. The main effects of $Treated$ and $Treatment$ are excluded, as $Treated$ is fully absorbed by the establishment fixed effects and $Treatment$ is fully absorbed by the interacted year dummies. If more cash flow results in fewer injuries, $\beta$ should be negative in the AJCA and oil experiments and positive in the financial crisis experiment, as treatment in that experiment involves a negative cash flow shock.

Motivated by the relation between injury rates and leverage documented in the previous
section, we also run regressions where we add the interactions of Debt/Assets with Treated, Treatment, and the interaction of Treated and Treatment in the AJCA and oil experiments. The coefficient on the final triple interaction captures differences in the response of injury rates to a positive cash flow shock with leverage. If the presence of debt constrains investment in safety, then additional cash flow should have a bigger impact on safety in firms with more leverage. We do not run this test for the financial crisis experiment, as exposure to treatment itself is based on a firm’s capital structure.

Panel A of Table 9 summarizes the characteristics of treated and untreated establishments prior to treatment (as their is no pre-treatment period in the oil experiment, the characteristics for the first year an establishment appears in the sample are shown instead). Two features are worth noting. First, while the treated group is reasonably large in the AJCA and financial crisis experiments, there are only 150 oil-exposed establishments (belonging to only 19 firms). This raises concerns about the external validity of the oil experiment. Second, in all three experiments, treated and untreated establishments differ substantially on many observable dimensions. For a difference-in-differences test to be valid, assignment to treated and untreated groups must be as if random with respect to the outcome variable, conditional on observables. Differences on observable dimensions raises concerns about whether this assumption is satisfied.

To address these concerns, we construct propensity score-matched samples of treated and untreated establishments in each experiment. In the case of the AJCA and financial crisis experiments, we estimate a probit model where the dependent variable is the treatment variable and the explanatory variables are the regressors from Table 6, using only the last observation for each establishment prior to treatment. We then fit the probit regression to estimate the propensity to be treated, and match each treated establishment to the untreated
establishment with the closest propensity. We do the same in the case of the oil experiment, except that we use the first observation for each establishment in the sample period for matching because of the lack of a pre-treatment period.

Panel B of Table 9 shows summary statistics for treated and matched untreated establishments in each experiment. The matching process is successful at eliminating differences in observable characteristics in the AJCA and oil experiments. In the AJCA experiment, only the mean values of Dividends/Assets and MarketToBook differ at a statistically significant level across the treated and untreated groups, and even those differences are small and only significant at the ten percent level. Differences in the means in the oil experiment are all small and statistically insignificant. Of course, this does not completely eliminate concerns about treatment being non-random, as unobservable characteristics could still differ between treated and untreated establishments. Matching is less successful at eliminating differences in the financial crisis experiment, raising concerns about non-random assignment in this experiment. We return to this issue later.

Another assumption required for a valid difference-in-differences exercise is that there are no differences in pre-treatment trends in the outcome variable in treated and untreated establishments. For the AJCA and financial crisis experiments, we assess the validity of the “parallel trends” assumption by plotting the portion of injury rates not explained by other observable variables for treated and untreated establishments over time. To do so, we estimate a negative binomial regression of injuries on the control variables in Table 6 with total hours worked as the exposure variable. The residuals from this regression represent unexplained injury counts. We scale these by total hours worked to compute unexplained injury rates. We then compute the mean unexplained injury rate for treated and untreated establishments in each year. For the AJCA experiment, we backfill the sample to 2001 so that we can observe the trends for a slightly longer period pre-AJCA.

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23 If multiple potential matches have the same propensity score, we randomly choose one.
24 For each 2001 establishment observation in the BLS data, we find the next year that it appears again in
plots in each experiment for the full sample of establishments available and for the matched samples. Tables 4 through 7 show these plots.

— Insert Figure 4 through 7 here —

Pre-treatment (2004) trends in treated and untreated establishments in the AJCA experiment are almost identical. On the other hand, pre-treatment trends in the treated and untreated establishments in the financial crisis experiment differ markedly, raising further concerns about the validity of this experiment (we return to this issue as well shortly). While there is no pre-treatment period in the oil experiment with which to assess validity of the parallel trends assumption (oil prices change every year), oil prices changed little from 2001 ($21.84 per barrel) to 2002 ($22.51 per barrel), the first year of our sample period. We find that the residual injury rate changes from -0.0048 in 2001 to -0.0047 in 2002 for treated establishments and from -0.0014 to -0.0016 for untreated establishments. The difference in change across the two groups is 0.000212. This is less than 1/10 of the mean absolute difference in annual change of 0.002356, providing support for satisfaction of the parallel trends assumption in the oil experiment.

As with the tests in the previous section, we conduct simulations to get a sense of the properties of the estimates from these difference-in-differences tests in each experiment. Appendix A describes these simulations and the results. In most though not all cases, OLS model estimates appear to be biased towards zero relative to the predicted effect.

4.1 Results from the experiments

We now present results from each of the three experiments. Table 10 presents estimates from the regression analysis in the AJCA experiment. The first four regressions show esti-
mates from Poisson and OLS regressions for the full and matched samples. The final four columns show results where Debt/Assets is interacted with the variables of interest.

— Insert Table 10 here —

The coefficient on the interaction of PosFP and Post04 is negative and statistically significant at the ten percent or better level in three of the first four columns. It is only statistically insignificant in the OLS regressions conducted on the matched sample. These results generally support the conclusion that a positive cash flow shock leads to lower injury rates. The coefficient on the triple interaction of Debt/Assets, PosFP, and Post04 is negative and statistically significant at the ten percent or better level in each of the last four columns, consistent with more leveraged firms being more constrained. We defer a discussion of the economic magnitudes implied by the estimates in this section to the end.

One concern is that firms may have invested repatriated cash disproportionately in safer activities. We would ideally like to measure the effect of a cash windfall on an employee’s injury risk, holding fixed the activities in which the employee is engaged. While we do not observe the mix of activities within an establishment, we show in Appendix B that firms with foreign profits do not shift employment towards establishments in safer industries after 2004. This provides some comfort that shifts in activities do not drive the results.

Table 11 presents estimates from our regression analysis in the financial crisis experiment. The coefficient on the interaction of HighDebtDue and Crisis is positive and statistically significant at the one and ten percent levels in the two Poisson regressions but is insignificant in the OLS regressions. The Poisson model estimates support an increase in injury rates in response to a negative cash flow shock, consistent with a reduction in cash flow reducing a firm’s investment in safety.

— Insert Table 11 here —
As noted above, both establishment characteristics and pre-treatment trends differ significantly between firms with and without high debt due entering the crisis, raising concerns about the validity of this experiment. We address these concerns as best we can with an alternative matching exercise. Specifically, we match on observable characteristics one-at-a-time as well as on pre-treatment injury rate trend separately, and re-estimate the Poisson model for each resulting matched sample. Table 12 shows the results. Panel A shows the results from matching on observable characteristics.

--- Insert Table 12 here ---

The first three columns show that the matching exercise is successful at eliminating differences in each given characteristic. The final two columns show that the coefficient on the interaction of Crisis and HighDebtDue is positive in all of the regressions (coefficients on the control variables are omitted from the table for brevity), and is statistically significant in all but two - the ones where we match on TangibleAssetRatio and Capex/Assets. While this raises concerns that differences in these two characteristics could conceivably drive the differential change in injury rates around treatment, we note that when we match on all characteristics, differences in these two are small and statistically significant (see Table 9). This provides some comfort that the Poisson regression results in Table 11 are not driven by differences in observable characteristics.

To match on pre-treatment trends, we compute pre-treatment annualized change in each establishment’s unexplained injury rate as the change in its unexplained injury rate the last two years it appears in the sample pre-2008, divided by the number of years between those two observations. We then match each establishment of a high debt due firm to the one from a non-high debt due firm with the closest pre-treatment change. The requirement of two years rather than one year of pre-2008 data reduces the sample size from 575 to 379 matched pairs. Panel B shows that this exercise is effective at eliminating differences in pre-treatment
trends, and that the coefficient on the interaction of Crisis and HighDebtDue continues to be positive and statistically significant in the resulting matched sample.

Table 13 presents estimates from our regression analysis in the oil experiment. The coefficient on the interaction of OilExposed and OilPrice is negative and statistically significant in each of the first four columns, consistent with injury rates decreasing (increasing) in response to a positive (negative) cash flow shock. The coefficient on the triple interaction of Debt/Assets, OilExposed, and OilPrice is negative and statistically significant at the ten percent level in the full sample Poisson regression (column 5), but not in the other three regressions. Thus we find less support for differential injury rate-cash flow sensitivities with leverage here than in the AJCA experiment.

The fact that we find reasonably consistent evidence across all three experiments is helpful, as none of the experiments is perfect. The major concern is that, despite our efforts to minimize differences in observable characteristics between treated and untreated establishments, unobserved characteristics such as production technology, operational skill, and growth might predict future changes in injury rates and be correlated with treatment. One factor mitigating such concerns is that the set of establishments forming the treatment groups is independent across the three experiments. Pairwise correlations in being treated are -0.0639 for the AJCA and financial crisis experiments, 0.1112 for the AJCA and oil experiments, and -0.0991 for the financial crisis and oil experiments. Thus, an unobserved factor affecting treatment would have to coincidentally produce results directionally consistent with the effects of financing constraints in three independent cases. In addition, it would have to account for the concentration of the effects in firms with more leverage in the AJCA experiment and, to a lesser degree, in the oil experiment.
Recall that the expected percentage point change in injury count per unit change in an explanatory variable in the Poisson model is given by $e^\beta - 1$. The interaction coefficients in the first column of Tables 10 and 11 imply a 6.8 percentage point decrease and a 9.0 percentage point increase in injuries following treatment in the AJCA and financial crisis experiments, respectively. Using the estimate of 745 injuries per year at the average-sized firm in the sample, treatment in the AJCA experiment is associated with a predicted decrease of 51.1 injuries in the average firm, while treatment in the financial crisis experiment is associated with 66.9 more predicted injuries.

To assess the implied effect of additional cash flow on injury rates quantitatively, we estimate the size of the cash flow shock as the average three-year cumulative profit of treated firms in the AJCA experiment, which is $1.140 billion, and the average debt maturing within a year of treated firms in the financial crisis experiment, which is $1.254 billion. As the standard deviation of total cash flow in our sample is $1.795 billion, the estimates from the two experiments suggest 80.4 and 95.7 fewer injuries per one standard deviation increase in cash flow. In reality, not all profits could be repatriated after the AJCA and not all maturing debt had to be repaid during the financial crisis. Thus these estimates are best seen as lower bounds on the predicted effect of a one standard deviation shock to cash flow.

The interaction coefficient in the first column of Table 13 implies that a one unit increase in log oil price translates into a 30.4 percentage point decreases in injuries in firms with oil establishments, or 226.2 fewer injuries in the average firm. To assess the effect of a price increase on the cash flows of the treated firms, we regress $\text{CashFlow}/\text{Assets}$ on log oil price using this sample of firms, controlling for firm fixed effects. The coefficient on log oil price is 0.056, with a standard error clustered at the firm level of 0.023. As the average firm with oil exposure has assets of $46.3$ billion, this coefficient implies that a one unit increase in log oil price is associated with a $2.595$ billion increase in cash flow. Thus the oil experiment estimate implies one fewer injury the next year for each additional $11.5$ million
of cash flow, or 156.5 fewer injuries following a one standard deviation increase in cash flow. The magnitudes of the effects implied by the estimates from the Poisson regressions, then, are reasonably consistent across the three experiments, though the OLS estimates are less consistent and imply smaller effects.

Appendix C shows results from additional analysis omitted from the body of the paper primarily for the sake of brevity. Appendix Tables C.1 through C.3 show results where we require propensity-based matches to be in the same industry as the treated establishment (differences in other observable characteristics are much greater in this case). Appendix Table C.4 shows that the results of the oil test are similar if we assign oil exposure only based on presence in the BLS data (i.e., if we don’t also use Capital IQ), while Appendix Table C.5 shows that these results are similar if we exclude the financial crisis period (2008 and 2009). All of these results are similar to those shown in Tables 10 through 13.

In Appendix Tables C.6 through C.8 we examine the effects of cash flow shocks on only DAFW injuries. Because of the small number of DAFW injuries (median of one per establishment-year, with zero DAFW injuries reported 49% of the time) and the small sample sizes in the experiments, we expect power to be limited in these tests. Nevertheless, the estimates are directionally similar to those when we use all injuries in the AJCA and oil experiments (though not in the financial crisis experiment), and are statistically significant in at least some cases.

5 Firm value and injury rates

In this section, we consider the implications of our results for optimal financial policy by investigating the sensitivity of firm value to injury risk. Employees bear costs of workplace injuries in the form of medical bills, suffering, and lost human capital. Workmen’s compensation insurance generally covers at least part of these costs, though the potential for
moral hazard generally precludes full insurance. Companies also bear costs from workplace injuries in the form of increased downtime, lower productivity, compensating wage differentials, and lawsuit payouts. While there is evidence that injuries depress productivity (Danna and Griffin 1999) and that employees demand a substantial compensating wage differential for injury risk (see Pouliakas and Theodossiou 2013 for a survey), evidence on the overall loss of firm value due to injuries is lacking. If a higher injury rate reduces firm value, then firms should take into account the impact of possible future financing constraints on injury risk when establishing financial policy.

To shed light on this issue, we regress firm value (Tobin’s Q) on a firm-level measure of the previous year’s injury rate, controlling for a number of firm-level observable characteristics as well as firm and year fixed effects. To compute a firm-level injury rate for a given year, we simply add up injuries at all establishments in the BLS data belonging to a firm during the year, and divide this by the sum of hours worked at those establishments during the year. We multiply this quotient by 1,000 to make the numbers easier to interpret. We call the resulting variable, measured in the prior year, $\text{LaggedInjuries/Hour}$. This is a crude measure of firm-level injury rate, as establishments participating in the BLS’s survey change from year to year. We exclude any establishment appearing in the data only once during our sample period to reduce this noise. Any remaining pure noise in the explanatory variable should produce attenuation bias, causing underestimation of the variable’s effect.

Table 14 presents the regression results. Columns (1) and (2) show estimates of the sensitivity of firm value to lagged injury rate without and with firm-level control variables. The coefficients on $\text{LaggedInjuries/Hour}$ are both negative and statistically significant at the five percent level. The mean and standard deviation of the firm-level measure of $\text{LaggedInjuries/Hour}$ are 0.041 and 0.0225, respectively. The coefficient on $\text{LaggedInjuries/Hour}$ of -2.715 in column (2) implies that a one standard deviation increase in injury rate is associated with a 6.1% decrease in firm value. For a firm with average market capitalization
and average number of employees as reported by Compustat, the coefficient implies a fall in firm value of $490,931 per additional injury.\footnote{This is calculated as $\beta \times \frac{\text{MarketCap}}{\text{HoursWorked}}$. \text{MarketCap} is $5.2$ billion, the average market capitalization of firms in our sample. \text{HoursWorked} is average employment for firms in our sample of $16,739$ as reported by Compustat times $1,718$, the average hours worked per employee (see Table 2).} This estimate is large but plausible. Existing estimates of compensating wage differentials alone are around $70,000 per expected injury (Pouliakas and Theodossiou 2013), and the costs of extra downtime and reduced productivity are likely significantly higher (Karasek and Theorell 1990).

While this result coheres with the combination of the results in sections 3 and 4 and existing evidence on specific costs to firms of injuries, it is difficult to rule out other explanations. For example, poor operational management may lead to both depressed firm value and higher injury rates. If investors are perfectly aware of management quality, then firm value should drop before poor management affects injuries. We therefore examine lead-lag patterns in injury rates and Tobin’s Q. To do so, we compute LeadInjuries/\text{Hour} as next year’s firm-level injury rate, and include that in the regressions. The inclusion of LaggedInjuries/\text{Hour} and LeadInjuries/\text{Hour} in a regression requires that a firm be present three consecutive years in the data to be included in the sample, reducing the sample size from 4,469 to 2,843. Columns (3) and (4) present the results from the augmented regressions. Firm value continues to be negatively related to LaggedInjuries/\text{Hour}, and the magnitudes of these relations are similar to those shown in the first two columns. Firm value appears to be unrelated to future injury rates (LeadInjuries/\text{Hour}). While these lead-lag patterns cannot be taken as strong evidence that higher injury rates cause a decrease in firm value, they represent additional evidence consistent with such an effect.
6 Conclusion

In summary, this paper provides new evidence that injury rates increase with leverage and decrease with operating cash flow. We contribute to the literature studying the effect of financing on employee welfare by uncovering evidence of a novel and important channel through which financing can affect the well-being of employees. Our results also have implications for optimal financial policy, as firm value appears to decline with injury rates. Further research in this area should yield additional insights into how firms internalize these costs and how the organizational form of the firm affects worker welfare.
References


Brown, Jennifer, and David Matsa, 2013, Boarding a Sinking Ship? An Investigation of Job Applications to Distressed Firms, *working paper*.


Table 1: Injuries by cause and type

This table shows the percentage of private sector U.S. on-the-job injuries in 2012 by nature (Panel A) and cause (Panel B), as reported by the BLS. These percentages were computed from incident rates available at http://www.bls.gov/news.release/pdf/osh2.pdf.

Panel A: Percent injuries by nature

<table>
<thead>
<tr>
<th>Nature of injury</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sprains, strains, tears</td>
<td>38.16</td>
</tr>
<tr>
<td>Soreness, pain, including back</td>
<td>14.67</td>
</tr>
<tr>
<td>Bruises, contusions</td>
<td>8.33</td>
</tr>
<tr>
<td>Fractures</td>
<td>8.03</td>
</tr>
<tr>
<td>Cuts, lacerations</td>
<td>8.03</td>
</tr>
<tr>
<td>Multipl traumatic injuries and disorders</td>
<td>3.07</td>
</tr>
<tr>
<td>Heat (thermal) burns</td>
<td>1.49</td>
</tr>
<tr>
<td>Carpal tunnel syndrome</td>
<td>0.89</td>
</tr>
<tr>
<td>Amuptations</td>
<td>0.59</td>
</tr>
<tr>
<td>Chemical burns</td>
<td>0.40</td>
</tr>
<tr>
<td>Tendonitis (other or unspecified)</td>
<td>0.30</td>
</tr>
<tr>
<td>All other natures</td>
<td>16.06</td>
</tr>
</tbody>
</table>

Panel B: Percent injuries by cause

<table>
<thead>
<tr>
<th>Cause of injury</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact with objects</td>
<td>29.69</td>
</tr>
<tr>
<td>Fall on same level</td>
<td>19.56</td>
</tr>
<tr>
<td>Over-exertion in lifting/lowering</td>
<td>14.44</td>
</tr>
<tr>
<td>Violence and other injuries by persons or animal</td>
<td>8.38</td>
</tr>
<tr>
<td>Transportation incidents</td>
<td>6.64</td>
</tr>
<tr>
<td>Fall to lower level</td>
<td>6.29</td>
</tr>
<tr>
<td>Exposure to harmful substances or environments</td>
<td>5.82</td>
</tr>
<tr>
<td>Slips or trips without fall</td>
<td>5.47</td>
</tr>
<tr>
<td>Repetitive motion</td>
<td>3.49</td>
</tr>
<tr>
<td>Fires and explosions</td>
<td>0.23</td>
</tr>
</tbody>
</table>
Table 2: Summary statistics

This table presents summary statistics for the data used in this study. Panel A shows the number of establishment-year observations by year, where an establishment refers to a single location of a company as identified by the BLS. Panel B shows summary statistics for the 43,731 establishment-year observations that we study. \( HoursWorked \) is the number of hours worked by employees of an establishment during a year. \( AverageEmployment \) is the average number of employees working at an establishment during a year. \( Injuries \) is the number of recorded injuries for an establishment in a year. \( DAFWInjuries \) is the number of days away from work injuries recorded for an establishment in a year. Each of these injury counts is also reported per hour worked and per average number of employees. The per hour rates are multiplied by 1,000 to make them easier to read. Panel C shows summary statistics for the parent-level firm-year observations in our sample. \( Debt/Assets \) is book debt divided by book assets. \( Cash/Assets \) is cash and equivalents divided by assets. \( CashFlow/Assets \) is the sum of income before extraordinary items and depreciation, divided by lagged assets. \( Dividends/Assets \) is common dividends divided by lagged assets. \( Assets \) are total reported assets. \( AssetTurnover \) is sales divided by lagged assets. \( MarketToBook \) is the ratio of the market value of equity to the book value of equity. \( TangibleAssetRatio \) is net plant, property and equipment divided by total assets. \( Capex/Assets \) is capital expenditures divided by lagged assets.

### Panel A: Observations by year

<table>
<thead>
<tr>
<th>Year</th>
<th>Observations</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>5,383</td>
<td>12.31</td>
</tr>
<tr>
<td>2003</td>
<td>5,554</td>
<td>12.70</td>
</tr>
<tr>
<td>2004</td>
<td>5,191</td>
<td>11.87</td>
</tr>
<tr>
<td>2005</td>
<td>5,112</td>
<td>11.69</td>
</tr>
<tr>
<td>2006</td>
<td>6,064</td>
<td>13.87</td>
</tr>
<tr>
<td>2007</td>
<td>5,802</td>
<td>13.27</td>
</tr>
<tr>
<td>2008</td>
<td>5,698</td>
<td>13.03</td>
</tr>
<tr>
<td>2009</td>
<td>4,927</td>
<td>11.27</td>
</tr>
</tbody>
</table>

### Panel B: Establishment summary statistics

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>( HoursWorked )</td>
<td>651.985</td>
<td>2,429.613</td>
</tr>
<tr>
<td>( AverageEmployment )</td>
<td>353</td>
<td>1,260</td>
</tr>
<tr>
<td>( Hours/Employee )</td>
<td>1,718</td>
<td>418</td>
</tr>
<tr>
<td>( 1,000 \times \text{Injuries/Hour} )</td>
<td>0.0247</td>
<td>0.0322</td>
</tr>
<tr>
<td>( Injuries/Employee )</td>
<td>0.0413</td>
<td>0.0529</td>
</tr>
<tr>
<td>( 1,000 \times \text{DAFWInjuries/Hour} )</td>
<td>0.0077</td>
<td>0.0153</td>
</tr>
<tr>
<td>( DAFWInjuries/Employee )</td>
<td>0.0128</td>
<td>0.0249</td>
</tr>
</tbody>
</table>

### Panel C: Firm summary statistics

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>10th percentile</th>
<th>Median</th>
<th>90th percentile</th>
</tr>
</thead>
<tbody>
<tr>
<td>( Debt/Assets )</td>
<td>0.230</td>
<td>0.219</td>
<td>0.001</td>
<td>0.206</td>
<td>0.445</td>
</tr>
<tr>
<td>( Cash/Assets )</td>
<td>0.121</td>
<td>0.152</td>
<td>0.013</td>
<td>0.069</td>
<td>0.300</td>
</tr>
<tr>
<td>( CashFlow/Assets )</td>
<td>0.102</td>
<td>0.146</td>
<td>-0.012</td>
<td>0.112</td>
<td>0.195</td>
</tr>
<tr>
<td>( Dividends/Assets )</td>
<td>0.014</td>
<td>0.025</td>
<td>0.000</td>
<td>0.007</td>
<td>0.035</td>
</tr>
<tr>
<td>( Assets )</td>
<td>12,457</td>
<td>23,804</td>
<td>260</td>
<td>4,252</td>
<td>27,723</td>
</tr>
<tr>
<td>( Log(Assets) )</td>
<td>8.140</td>
<td>1.864</td>
<td>5.562</td>
<td>8.355</td>
<td>10.230</td>
</tr>
<tr>
<td>( AssetTurnover )</td>
<td>1.690</td>
<td>0.948</td>
<td>0.663</td>
<td>1.512</td>
<td>3.163</td>
</tr>
<tr>
<td>( MarketToBook )</td>
<td>1.675</td>
<td>1.266</td>
<td>0.650</td>
<td>1.380</td>
<td>2.935</td>
</tr>
<tr>
<td>( TangibleAssetRatio )</td>
<td>0.353</td>
<td>0.200</td>
<td>0.110</td>
<td>0.330</td>
<td>0.614</td>
</tr>
<tr>
<td>( Capex/Assets )</td>
<td>0.055</td>
<td>0.068</td>
<td>0.010</td>
<td>0.035</td>
<td>0.113</td>
</tr>
</tbody>
</table>
Table 3: Correlation matrix

This table shows the matrix of correlations among the different explanatory variables used in the paper. The variables are all measured at the establishment’s parent firm level except for $\log(\text{Employees})$ and $\text{Hours/Employee}$, which are measured at the establishment level. See Table 2 for definitions of these variables.

<table>
<thead>
<tr>
<th></th>
<th>Debt/Assets</th>
<th>Cash/Assets</th>
<th>CashFlow/Assets</th>
<th>Dividends/Assets</th>
<th>Log (Assets)</th>
<th>Asset Turnover</th>
<th>Market ToBook</th>
<th>Tangible AssetRatio</th>
<th>Capex/Assets</th>
<th>Log (Employees)</th>
<th>Hours/Employee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Debt/Assets</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cash/Assets</td>
<td>-0.261</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CashFlow/Assets</td>
<td>-0.155</td>
<td>-0.051</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dividends/Assets</td>
<td>-0.095</td>
<td>-0.066</td>
<td>0.146</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Log (Assets)</td>
<td>0.031</td>
<td>-0.181</td>
<td>0.123</td>
<td>0.188</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asset Turnover</td>
<td>-0.257</td>
<td>-0.054</td>
<td>0.180</td>
<td>-0.065</td>
<td>-0.077</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Market ToBook</td>
<td>-0.170</td>
<td>0.218</td>
<td>0.127</td>
<td>0.212</td>
<td>0.026</td>
<td>0.098</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tangible AssetRatio</td>
<td>0.201</td>
<td>-0.251</td>
<td>0.107</td>
<td>0.058</td>
<td>0.184</td>
<td>0.092</td>
<td>0.006</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capex/Assets</td>
<td>-0.095</td>
<td>-0.071</td>
<td>0.219</td>
<td>-0.018</td>
<td>-0.026</td>
<td>0.194</td>
<td>0.163</td>
<td>0.432</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Log (Employees)</td>
<td>0.063</td>
<td>0.014</td>
<td>-0.051</td>
<td>0.045</td>
<td>0.200</td>
<td>-0.218</td>
<td>-0.016</td>
<td>-0.061</td>
<td>-0.168</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>Hours/Employee</td>
<td>0.081</td>
<td>-0.066</td>
<td>-0.086</td>
<td>0.085</td>
<td>0.066</td>
<td>-0.265</td>
<td>0.017</td>
<td>-0.150</td>
<td>-0.200</td>
<td>0.266</td>
<td>1.000</td>
</tr>
</tbody>
</table>
Table 4: Injury rates by industry

This table shows various mean annual establishment-level injury rates across different industries from 2002 through 2009. An establishment refers to a single location of a company as identified by the Bureau of Labor Statistics. Each industry depicted represents one of the Fama-French 48 industries. Two industries (Tobacco Products and Non-Metallic and Industrial Metal Mining) are omitted because the small number of establishments in these industries risks revealing the identity of an individual establishment or firm. Industries are sorted from highest Injuries/Employee to lowest. See Table 2 for definitions of the injury rate variables.

<table>
<thead>
<tr>
<th>Industry</th>
<th>Injuries/Employee</th>
<th>Injuries/Hour</th>
<th>DAFWInjuries/Employee</th>
<th>DAFWInjuries/Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Candy &amp; Soda</td>
<td>0.0829</td>
<td>0.0418</td>
<td>0.0219</td>
<td>0.0111</td>
</tr>
<tr>
<td>Fabricated Products</td>
<td>0.0822</td>
<td>0.0405</td>
<td>0.0214</td>
<td>0.0106</td>
</tr>
<tr>
<td>Transportation</td>
<td>0.0771</td>
<td>0.0454</td>
<td>0.0456</td>
<td>0.0271</td>
</tr>
<tr>
<td>Automobiles and Trucks</td>
<td>0.0685</td>
<td>0.0353</td>
<td>0.0154</td>
<td>0.0081</td>
</tr>
<tr>
<td>Steel Works Etc</td>
<td>0.0656</td>
<td>0.0313</td>
<td>0.0153</td>
<td>0.0074</td>
</tr>
<tr>
<td>Food Products</td>
<td>0.0613</td>
<td>0.0298</td>
<td>0.0137</td>
<td>0.0065</td>
</tr>
<tr>
<td>Construction Materials</td>
<td>0.0567</td>
<td>0.0280</td>
<td>0.0125</td>
<td>0.0062</td>
</tr>
<tr>
<td>Real Estate</td>
<td>0.0549</td>
<td>0.0272</td>
<td>0.0174</td>
<td>0.0090</td>
</tr>
<tr>
<td>Rubber and Plastic Products</td>
<td>0.0535</td>
<td>0.0267</td>
<td>0.0133</td>
<td>0.0066</td>
</tr>
<tr>
<td>Almost Nothing</td>
<td>0.0533</td>
<td>0.0283</td>
<td>0.0184</td>
<td>0.0095</td>
</tr>
<tr>
<td>Electrical Equipment</td>
<td>0.0515</td>
<td>0.0256</td>
<td>0.0097</td>
<td>0.0048</td>
</tr>
<tr>
<td>Machinery</td>
<td>0.0506</td>
<td>0.0253</td>
<td>0.0105</td>
<td>0.0053</td>
</tr>
<tr>
<td>Apparel</td>
<td>0.0501</td>
<td>0.0305</td>
<td>0.0110</td>
<td>0.0072</td>
</tr>
<tr>
<td>Consumer Goods</td>
<td>0.0494</td>
<td>0.0255</td>
<td>0.0094</td>
<td>0.0048</td>
</tr>
<tr>
<td>Agriculture</td>
<td>0.0491</td>
<td>0.0251</td>
<td>0.0120</td>
<td>0.0064</td>
</tr>
<tr>
<td>Recreation</td>
<td>0.0465</td>
<td>0.0248</td>
<td>0.0085</td>
<td>0.0043</td>
</tr>
<tr>
<td>Beer &amp; Liquor</td>
<td>0.0447</td>
<td>0.0248</td>
<td>0.0118</td>
<td>0.0064</td>
</tr>
<tr>
<td>Restaraunts, Hotels, Motels</td>
<td>0.0431</td>
<td>0.0313</td>
<td>0.0099</td>
<td>0.0074</td>
</tr>
<tr>
<td>Shipbuilding, Railroad Equipment</td>
<td>0.0429</td>
<td>0.0216</td>
<td>0.0103</td>
<td>0.0053</td>
</tr>
<tr>
<td>Business Supplies</td>
<td>0.0415</td>
<td>0.0205</td>
<td>0.0118</td>
<td>0.0059</td>
</tr>
<tr>
<td>Personal Services</td>
<td>0.0408</td>
<td>0.0252</td>
<td>0.0133</td>
<td>0.0081</td>
</tr>
<tr>
<td>Healthcare</td>
<td>0.0406</td>
<td>0.0251</td>
<td>0.0108</td>
<td>0.0065</td>
</tr>
<tr>
<td>Retail</td>
<td>0.0403</td>
<td>0.0286</td>
<td>0.0113</td>
<td>0.0081</td>
</tr>
<tr>
<td>Shipping Containers</td>
<td>0.0380</td>
<td>0.0184</td>
<td>0.0068</td>
<td>0.0033</td>
</tr>
<tr>
<td>Wholesale</td>
<td>0.0374</td>
<td>0.0235</td>
<td>0.0103</td>
<td>0.0064</td>
</tr>
<tr>
<td>Construction</td>
<td>0.0352</td>
<td>0.0173</td>
<td>0.0112</td>
<td>0.0056</td>
</tr>
<tr>
<td>Textiles</td>
<td>0.0336</td>
<td>0.0172</td>
<td>0.0054</td>
<td>0.0026</td>
</tr>
<tr>
<td>Business Services</td>
<td>0.0329</td>
<td>0.0179</td>
<td>0.0098</td>
<td>0.0054</td>
</tr>
<tr>
<td>Medical Equipment</td>
<td>0.0323</td>
<td>0.0166</td>
<td>0.0085</td>
<td>0.0043</td>
</tr>
<tr>
<td>Printing and Publishing</td>
<td>0.0316</td>
<td>0.0183</td>
<td>0.0090</td>
<td>0.0052</td>
</tr>
<tr>
<td>Utilities</td>
<td>0.0309</td>
<td>0.0152</td>
<td>0.0090</td>
<td>0.0042</td>
</tr>
<tr>
<td>Communication</td>
<td>0.0308</td>
<td>0.0162</td>
<td>0.0143</td>
<td>0.0076</td>
</tr>
<tr>
<td>Pharmaceutical Products</td>
<td>0.0301</td>
<td>0.0150</td>
<td>0.0072</td>
<td>0.0036</td>
</tr>
<tr>
<td>Aircraft</td>
<td>0.0242</td>
<td>0.0120</td>
<td>0.0048</td>
<td>0.0024</td>
</tr>
<tr>
<td>Petroleum and Natural Gas</td>
<td>0.0239</td>
<td>0.0118</td>
<td>0.0077</td>
<td>0.0038</td>
</tr>
<tr>
<td>Measuring and Control Equipment</td>
<td>0.0219</td>
<td>0.0112</td>
<td>0.0053</td>
<td>0.0027</td>
</tr>
<tr>
<td>Defense</td>
<td>0.0213</td>
<td>0.0106</td>
<td>0.0050</td>
<td>0.0025</td>
</tr>
<tr>
<td>Chemicals</td>
<td>0.0201</td>
<td>0.0097</td>
<td>0.0047</td>
<td>0.0022</td>
</tr>
<tr>
<td>Electronic Equipment</td>
<td>0.0183</td>
<td>0.0093</td>
<td>0.0043</td>
<td>0.0022</td>
</tr>
<tr>
<td>Insurance</td>
<td>0.0151</td>
<td>0.0090</td>
<td>0.0018</td>
<td>0.0010</td>
</tr>
<tr>
<td>Entertainment</td>
<td>0.0140</td>
<td>0.0120</td>
<td>0.0031</td>
<td>0.0025</td>
</tr>
<tr>
<td>Computers</td>
<td>0.0119</td>
<td>0.0060</td>
<td>0.0031</td>
<td>0.0016</td>
</tr>
<tr>
<td>Trading</td>
<td>0.0116</td>
<td>0.0062</td>
<td>0.0010</td>
<td>0.0005</td>
</tr>
<tr>
<td>Banking</td>
<td>0.0110</td>
<td>0.0055</td>
<td>0.0027</td>
<td>0.0014</td>
</tr>
</tbody>
</table>
Table 5: Panel Variance Statistics

This table presents a summary of the relative variation between and within the establishment, firm, and industry groups. The first two rows report the mean and standard deviation of the variable for the full sample. The second two rows report the standard deviation across different establishments controlling for the time series mean and within each establishment controlling for the establishment mean. The third two rows report the standard deviation between and within different firms. The fourth two rows report the standard deviation between and within each of 48 Fama-French industry categories.

<table>
<thead>
<tr>
<th></th>
<th>Injuries/Hour x 1,000</th>
<th>Injuries/Employee</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Overall Mean</strong></td>
<td>0.024</td>
<td>0.041</td>
</tr>
<tr>
<td><strong>Overall Std. Dev.</strong></td>
<td>0.032</td>
<td>0.053</td>
</tr>
<tr>
<td><strong>Between Establishment</strong></td>
<td>0.033</td>
<td>0.053</td>
</tr>
<tr>
<td><strong>Within Establishment</strong></td>
<td>0.013</td>
<td>0.020</td>
</tr>
<tr>
<td><strong>Between Firm</strong></td>
<td>0.021</td>
<td>0.037</td>
</tr>
<tr>
<td><strong>Within Firm</strong></td>
<td>0.027</td>
<td>0.044</td>
</tr>
<tr>
<td><strong>Between Industry</strong></td>
<td>0.010</td>
<td>0.019</td>
</tr>
<tr>
<td><strong>Within Industry</strong></td>
<td>0.031</td>
<td>0.050</td>
</tr>
</tbody>
</table>
Table 6: Firm- and establishment-level determinants of injury rates

This table presents estimates of the relation between establishment-level injury rates and firm and establishment characteristics from a series of regressions. Columns (1) through (4) show results from estimating negative binomial, Poisson, establishment fixed effects Poisson, and establishment fixed effects OLS models, respectively. The dependent variable in columns (1) through (3) is the number of injuries reported at an establishment in a given year. The exposure variable in these regressions is HoursWorked. The dependent variable in column (4) is \( \log(\text{Injuries} + 1) / \text{HoursWorked} \). Columns (5) through (6) show estimates from Poisson models where \( \log(\text{DAFWInjuries}) \) and \( \log(\text{NonDAFWInjuries}) \) are the dependent variables. Columns (7) and (8) estimates from OLS models where \( \log(\text{DAFWInjuries} + 1) / \text{HoursWorked} \) and \( \log(\text{NonDAFWInjuries} + 1) / \text{HoursWorked} \) are the dependent variables. The explanatory variables are all measured at the establishment’s parent firm level except for Log(Employees) and Hours/Employee, which are measured at the establishment level. Debt/Assets, Cash/Assets, Log(Assets), MarketToBook, and TangibleAssetRatio are lagged one year, while CashFlow/Assets, Dividends/Assets, AssetTurnover, Capex/Assets, Log(Employees), and Hours/Employee are measured contemporaneously. See Table 2 for definitions of these variables. Standard errors clustered at the firm level are reported in parentheses below each point estimate. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively, based on a two-tailed z-test.

<table>
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<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
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<td></td>
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<td>All</td>
<td>All</td>
<td>All</td>
<td>DAFW</td>
<td>DAFW</td>
<td>DAFW</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Debt/Assets</td>
<td>0.421***</td>
<td>0.367***</td>
<td>0.352***</td>
<td>0.097*</td>
<td>0.203</td>
<td>0.432***</td>
<td>0.114**</td>
<td>0.138**</td>
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<td></td>
<td>(0.137)</td>
<td>(0.140)</td>
<td>(0.128)</td>
<td>(0.058)</td>
<td>(0.162)</td>
<td>(0.135)</td>
<td>(0.054)</td>
<td>(0.062)</td>
</tr>
<tr>
<td>Cash/Assets</td>
<td>-0.599***</td>
<td>-0.500**</td>
<td>-0.148</td>
<td>0.015</td>
<td>-0.126</td>
<td>-0.141</td>
<td>0.041</td>
<td>0.011</td>
</tr>
<tr>
<td></td>
<td>(0.151)</td>
<td>(0.226)</td>
<td>(0.163)</td>
<td>(0.058)</td>
<td>(0.317)</td>
<td>(0.142)</td>
<td>(0.050)</td>
<td>(0.060)</td>
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<tr>
<td>CashFlow/Assets</td>
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<td>-0.138</td>
<td>0.074</td>
<td>0.047</td>
<td>-0.027</td>
<td>0.126</td>
<td>0.109**</td>
<td>0.287***</td>
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<td></td>
<td>(0.100)</td>
<td>(0.086)</td>
<td>(0.064)</td>
<td>(0.051)</td>
<td>(0.067)</td>
<td>(0.086)</td>
<td>(0.045)</td>
<td>(0.053)</td>
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<tr>
<td>Dividends/Assets</td>
<td>0.837</td>
<td>-1.814***</td>
<td>0.120</td>
<td>-0.614***</td>
<td>0.378</td>
<td>-0.022</td>
<td>-0.338*</td>
<td>-0.730***</td>
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<td>(0.453)</td>
<td>(0.177)</td>
<td>(0.195)</td>
</tr>
<tr>
<td>Log(Assets)</td>
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<td>-0.066***</td>
<td>0.032</td>
<td>-0.155***</td>
<td>0.117</td>
<td>0.014</td>
<td>-0.095***</td>
<td>-0.148***</td>
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<tr>
<td></td>
<td>(0.022)</td>
<td>(0.018)</td>
<td>(0.046)</td>
<td>(0.022)</td>
<td>(0.077)</td>
<td>(0.047)</td>
<td>(0.021)</td>
<td>(0.024)</td>
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<tr>
<td>AssetTurnover</td>
<td>0.177***</td>
<td>0.214***</td>
<td>0.092**</td>
<td>-0.003</td>
<td>0.210***</td>
<td>0.038</td>
<td>-0.001</td>
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<td>(0.050)</td>
<td>(0.041)</td>
<td>(0.019)</td>
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<td>MarketToBook</td>
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<td>0.000</td>
<td>-0.030**</td>
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<td>(0.014)</td>
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<td>(0.015)</td>
<td>(0.007)</td>
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<tr>
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<td>0.470***</td>
<td>0.044</td>
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<td>0.636***</td>
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<td>(0.190)</td>
<td>(0.226)</td>
<td>(0.099)</td>
<td>(0.267)</td>
<td>(0.247)</td>
<td>(0.097)</td>
<td>(0.108)</td>
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<td>Capex/Assets</td>
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<td>-0.555**</td>
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<td>-0.996***</td>
<td>-0.228</td>
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<td>(0.151)</td>
<td>(0.432)</td>
<td>(0.340)</td>
<td>(0.124)</td>
<td>(0.173)</td>
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<td>-0.077**</td>
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<td>-0.001***</td>
<td>-0.000***</td>
<td>-0.000***</td>
<td>-0.001***</td>
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<td>Poisson</td>
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<td>Poisson</td>
<td>Poisson</td>
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<td>No</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>State-year dummies</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>Indus-year dummies</td>
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</table>
Table 7: Injury rates and lagged and future leverage

This table presents estimates of the relation between establishment-level injury rates and lead and lagged Debt/Assets from a series of regressions. Columns (1) through (4) show results from estimating negative binomial, Poisson, establishment fixed effects Poisson, and establishment fixed effects OLS models, respectively. The dependent variable in columns (1) through (3) is the number of injuries reported at an establishment in a given year. The number of hours worked at the establishment during the year is specified as an exposure variable in these regressions. The dependent variable in column (4) is log[(Injuries + 1)/HoursWorked]. The explanatory variables are all measured at the establishment’s parent firm level except for Log(Employee) and Hours/Employee, which are measured at the establishment level. LaggedDebt/Assets is Debt/Assets at the end of the year prior to the observation, while LeadDebt/Assets is Debt/Assets at the end of the year following the observation. Cash/Assets, Log(Assets), MarketToBook, and TangibleAssetRatio are lagged one year, while CashFlow/Assets, Dividends/Assets, AssetTurnover, Capex/Assets, Log(Employee), and Hours/Employee are measured contemporaneously. See Table 2 for definitions of these variables. Standard errors clustered at the firm level are reported in parentheses below each point estimate. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively, based on a two-tailed z-test.

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<th>(4)</th>
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<td>LaggedDebt/Assets</td>
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<td>0.345**</td>
<td>0.358***</td>
<td>0.192***</td>
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<td>(0.200)</td>
<td>(0.158)</td>
<td>(0.119)</td>
<td>(0.067)</td>
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<td>LeadDebt/Assets</td>
<td>-0.052</td>
<td>0.086</td>
<td>-0.032</td>
<td>-0.058</td>
</tr>
<tr>
<td></td>
<td>(0.156)</td>
<td>(0.112)</td>
<td>(0.105)</td>
<td>(0.055)</td>
</tr>
<tr>
<td>Cash/Assets</td>
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<td>-0.434**</td>
<td>-0.209</td>
<td>0.033</td>
</tr>
<tr>
<td></td>
<td>(0.153)</td>
<td>(0.216)</td>
<td>(0.158)</td>
<td>(0.066)</td>
</tr>
<tr>
<td>CashFlow/Assets</td>
<td>-0.048</td>
<td>-0.133</td>
<td>0.068</td>
<td>0.212***</td>
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<td>(0.087)</td>
<td>(0.082)</td>
<td>(0.060)</td>
<td>(0.054)</td>
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<td>Dividends/Assets</td>
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<td>-1.905**</td>
<td>0.084</td>
<td>-0.853***</td>
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<tr>
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<td>(1.148)</td>
<td>(0.890)</td>
<td>(0.409)</td>
<td>(0.186)</td>
</tr>
<tr>
<td>Log(Assets)</td>
<td>-0.071***</td>
<td>-0.073***</td>
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<td>-0.136***</td>
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<tr>
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<td>(0.022)</td>
<td>(0.018)</td>
<td>(0.045)</td>
<td>(0.025)</td>
</tr>
<tr>
<td>AssetTurnover</td>
<td>0.168***</td>
<td>0.218***</td>
<td>0.054</td>
<td>-0.059***</td>
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<td>(0.050)</td>
<td>(0.050)</td>
<td>(0.045)</td>
<td>(0.022)</td>
</tr>
<tr>
<td>MarketToBook</td>
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<td>-0.015</td>
<td>-0.033***</td>
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<td>(0.026)</td>
<td>(0.028)</td>
<td>(0.016)</td>
<td>(0.007)</td>
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<tr>
<td>TangibleAssetRatio</td>
<td>0.809***</td>
<td>0.927***</td>
<td>-0.272</td>
<td>0.709***</td>
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<tr>
<td></td>
<td>(0.225)</td>
<td>(0.197)</td>
<td>(0.233)</td>
<td>(0.115)</td>
</tr>
<tr>
<td>Capex/Assets</td>
<td>-0.565</td>
<td>-0.203***</td>
<td>-0.499</td>
<td>0.116</td>
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<td>(0.458)</td>
<td>(0.484)</td>
<td>(0.310)</td>
<td>(0.165)</td>
</tr>
<tr>
<td>Log(Employee)</td>
<td>-0.021</td>
<td>-0.033**</td>
<td>-0.159***</td>
<td>-0.340***</td>
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<td>(0.017)</td>
<td>(0.017)</td>
<td>(0.052)</td>
<td>(0.022)</td>
</tr>
<tr>
<td>Hours/Employee</td>
<td>-0.000***</td>
<td>-0.001***</td>
<td>-0.007***</td>
<td>-0.000***</td>
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<td></td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
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<td>Poisson</td>
<td>OLS</td>
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<td>Yes</td>
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<td>Yes</td>
<td>Yes</td>
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<td>No</td>
<td>Yes</td>
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<tr>
<td>Neg Bin α</td>
<td>0.726***</td>
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</table>
This table presents estimates from Poisson models with establishment fixed effects in which the dependent variable is the number of injuries reported at an establishment in a given year. The number of hours worked at the establishment during the year is specified as an exposure variable. The explanatory variables are all measured at the establishment’s parent firm level except for Log(Employees) and Hours/Employee, which are measured at the establishment level. Debt/Assets, Cash/Assets, Log(Assets), MarketToBook, and TangibleAssetRatio are lagged one year, while CashFlow/Assets, Dividends/Assets, AssetTurnover, Capex/Assets, Log(Employees), and Hours/Employee are measured contemporaneously. See Table 2 for definitions of these variables. All regressions include year dummies. A firm is classified as having low (high) asset tangibility if its industry mean tangible asset ratio (net plant, property and equipment divided by total assets) is below (above) the median for the sample. Standard errors clustered at the firm level are reported in parentheses below each point estimate. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively, based on a two-tailed z-test.

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<td>OLS</td>
</tr>
<tr>
<td>Debt/Assets</td>
<td>0.461***</td>
<td>0.142**</td>
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<td>(0.144)</td>
<td>(0.070)</td>
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<tr>
<td>Cash/Assets</td>
<td>-0.331</td>
<td>-0.066</td>
</tr>
<tr>
<td></td>
<td>(0.294)</td>
<td>(0.090)</td>
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<tr>
<td>CashFlow/Assets</td>
<td>0.079</td>
<td>0.220</td>
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<td>(0.067)</td>
<td>(0.161)</td>
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<tr>
<td>Dividends/Assets</td>
<td>0.043</td>
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<td></td>
<td>(0.336)</td>
<td>(0.176)</td>
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<td>Log (assets)</td>
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<td>(0.029)</td>
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<td>(0.043)</td>
<td>(0.021)</td>
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<tr>
<td>Market-to-Book</td>
<td>-0.015</td>
<td>0.025***</td>
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<td>(0.014)</td>
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<tr>
<td>Tangible asset ratio</td>
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<td>Capex/Assets</td>
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<td>Log (Employees)</td>
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<td>-0.299***</td>
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<td>(0.023)</td>
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<td>Hours/Employee</td>
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<td>-0.000***</td>
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<td>(0.000)</td>
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This table shows the mean values of different firm and establishment characteristics for treated and untreated establishments in each of the three quasi-natural experiments. Panel A shows means for the full sample of available establishments. Panel B shows means for samples matched on observable characteristics. An establishment is in the treated group in the AJCA experiment if it reported positive cumulative foreign profits over the three years prior to 2004 (the year of the AJCA), and in the untreated group otherwise. An establishment is in the treated group in the financial crisis experiment if its parent firm had debt due in the next year as of fiscal year end 2007 in the top quartile in the sample, and zero otherwise. An establishment is in the treated group in the oil experiment if its parent firm is in the oil production business and zero otherwise. Oil-producing establishments themselves are omitted from the sample. ***, **, and * indicate that a characteristic differs between treated and untreated establishments at the 1%, 5%, and 10% level, respectively, based on a t-test.

### Panel A: Full Sample

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<th>Financial Crisis Treated</th>
<th>Untreated</th>
<th>Oil Treated</th>
<th>Untreated</th>
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<tr>
<td>Debt/Assets</td>
<td>0.252</td>
<td>0.241</td>
<td>0.317***</td>
<td>0.207</td>
<td>0.207*</td>
<td>0.236</td>
</tr>
<tr>
<td>Cash/Assets</td>
<td>0.089***</td>
<td>0.122</td>
<td>0.076***</td>
<td>0.123</td>
<td>0.090</td>
<td>0.110</td>
</tr>
<tr>
<td>CashFlow/Assets</td>
<td>0.100</td>
<td>0.099</td>
<td>0.118</td>
<td>0.121</td>
<td>0.112</td>
<td>0.106</td>
</tr>
<tr>
<td>Dividends/Assets</td>
<td>0.014***</td>
<td>0.010</td>
<td>0.013***</td>
<td>0.021</td>
<td>0.022***</td>
<td>0.012</td>
</tr>
<tr>
<td>AssetTurnover</td>
<td>1.354***</td>
<td>1.706</td>
<td>1.636***</td>
<td>1.496</td>
<td>0.986***</td>
<td>1.706</td>
</tr>
<tr>
<td>MarketToBook</td>
<td>1.617</td>
<td>1.646</td>
<td>1.508***</td>
<td>1.810</td>
<td>1.279***</td>
<td>1.765</td>
</tr>
<tr>
<td>TangibleAssetRatio</td>
<td>0.317***</td>
<td>0.387</td>
<td>0.443***</td>
<td>0.306</td>
<td>0.384</td>
<td>0.367</td>
</tr>
<tr>
<td>Capex/Assets</td>
<td>0.048***</td>
<td>0.060</td>
<td>0.076***</td>
<td>0.062</td>
<td>0.067</td>
<td>0.065</td>
</tr>
<tr>
<td>Log(Employees)</td>
<td>5.765***</td>
<td>5.200</td>
<td>5.350***</td>
<td>5.656</td>
<td>5.308***</td>
<td>5.044</td>
</tr>
<tr>
<td>Hours/Employee</td>
<td>1.919***</td>
<td>1.716</td>
<td>1.757***</td>
<td>1.906</td>
<td>2.084***</td>
<td>1.756</td>
</tr>
</tbody>
</table>

### Panel B: Matched Sample

<table>
<thead>
<tr>
<th></th>
<th>AJCA Treated</th>
<th>Untreated</th>
<th>Debt Maturity Treated</th>
<th>Untreated</th>
<th>Oil Treated</th>
<th>Untreated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Establishments</td>
<td>949</td>
<td>949</td>
<td>575</td>
<td>575</td>
<td>150</td>
<td>150</td>
</tr>
<tr>
<td>Debt/Assets</td>
<td>0.252</td>
<td>0.263</td>
<td>0.317***</td>
<td>0.413</td>
<td>0.201</td>
<td>0.186</td>
</tr>
<tr>
<td>Cash/Assets</td>
<td>0.088</td>
<td>0.083</td>
<td>0.076***</td>
<td>0.122</td>
<td>0.108</td>
<td>0.113</td>
</tr>
<tr>
<td>CashFlow/Assets</td>
<td>0.100</td>
<td>0.093</td>
<td>0.118***</td>
<td>0.091</td>
<td>0.119</td>
<td>0.114</td>
</tr>
<tr>
<td>Dividends/Assets</td>
<td>0.014*</td>
<td>0.012</td>
<td>0.013***</td>
<td>0.010</td>
<td>0.022</td>
<td>0.018</td>
</tr>
<tr>
<td>MarketToBook</td>
<td>1.617*</td>
<td>1.493</td>
<td>1.508***</td>
<td>1.965</td>
<td>1.322</td>
<td>1.327</td>
</tr>
<tr>
<td>TangibleAssetRatio</td>
<td>0.317</td>
<td>0.319</td>
<td>0.443</td>
<td>0.454</td>
<td>0.367</td>
<td>0.342</td>
</tr>
<tr>
<td>Capex/Assets</td>
<td>0.048</td>
<td>0.049</td>
<td>0.076</td>
<td>0.079</td>
<td>0.068</td>
<td>0.064</td>
</tr>
<tr>
<td>Log(Employees)</td>
<td>5.765</td>
<td>5.971</td>
<td>5.349*</td>
<td>5.554</td>
<td>5.251</td>
<td>5.257</td>
</tr>
<tr>
<td>Hours/Employee</td>
<td>1.919</td>
<td>1.924</td>
<td>1.757</td>
<td>1.741</td>
<td>2.107</td>
<td>2.083</td>
</tr>
</tbody>
</table>
Table 10: Workplace injuries and the American Jobs Creation Act

This table presents estimates of the effect of the American Jobs Creation Act of 2004 on injury rates. Odd-numbered columns show results from establishment fixed effects Poisson regressions, where the dependent variable is the number of injuries reported at an establishment in a given year, and the number of hours worked at the establishment during the year is specified as an exposure variable. Even-numbered columns show results from establishment fixed effects OLS regressions, where the dependent variable is \( \log(\text{Injuries} + 1) / \text{Hours Worked} \). All regressions include industry-year and state-year dummies. Only observations in 2002, 2003, 2005 and 2006 are used in the regressions. Regressions shown in columns (1), (2), (5), and (6) use all establishments appearing in the sample at least once before and after 2004 during this period. Regressions in columns (3), (4), (7), and (8) use a propensity score-matched sample.

Post04 is an indicator variable taking a value of one in years 2005 and 2006 and zero in years 2002 and 2003. PosFP is an indicator taking a value of one if the parent firm’s cumulative reported foreign profits in 2001-2003 were positive, and zero otherwise. Debt/Assets, Cash/Assets, Log(Assets), MarketToBook, and TangibleAssetRatio are lagged one year, while CashFlow/Assets, Dividends/Assets, AssetTurnover, Capex/Assets, Log(Employees), and Hours/Employee are measured contemporaneously. See Table 2 for definitions of these variables. Standard errors clustered at the firm level are reported in parentheses below each point estimate. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively, based on a two-tailed z-test.

<table>
<thead>
<tr>
<th>Sample</th>
<th>Full sample Poisson</th>
<th>OLS</th>
<th>Propensity-matched Poisson</th>
<th>OLS</th>
<th>Full sample Poisson</th>
<th>OLS</th>
<th>Propensity-matched Poisson</th>
<th>OLS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post04 * PosFP</td>
<td>-0.071** (0.034)</td>
<td>-0.065** (0.028)</td>
<td>-0.072** (0.034)</td>
<td>-0.032 (0.071)</td>
<td>0.190** (0.078)</td>
<td>-0.010 (0.050)</td>
<td>0.225*** (0.077)</td>
<td>0.087 (0.064)</td>
</tr>
<tr>
<td>Debt/Assets * Post04</td>
<td>0.465*** (0.178)</td>
<td>0.028 (0.093)</td>
<td>0.204* (0.115)</td>
<td>0.106 (0.142)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Debt/Assets * PosFP</td>
<td>0.016 (0.328)</td>
<td>-0.295 (0.258)</td>
<td>0.983** (0.444)</td>
<td>-0.038 (0.390)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Debt/Assets * Post04 * PosFP</td>
<td>-1.126*** (0.284)</td>
<td>-0.303* (0.183)</td>
<td>-0.826*** (0.251)</td>
<td>-0.392* (0.225)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Debt/Assets</td>
<td>0.521*** (0.110)</td>
<td>0.149 (0.113)</td>
<td>-0.161 (0.181)</td>
<td>0.031 (0.287)</td>
<td>0.328** (0.159)</td>
<td>0.221 (0.138)</td>
<td>-0.910*** (0.223)</td>
<td>-0.045 (0.261)</td>
</tr>
<tr>
<td>Cash/Assets</td>
<td>-0.159 (0.189)</td>
<td>-0.20 (0.113)</td>
<td>-0.26 (0.233)</td>
<td>-0.041 (0.298)</td>
<td>-0.129 (0.187)</td>
<td>-0.017 (0.114)</td>
<td>-0.156 (0.246)</td>
<td>0.084 (0.207)</td>
</tr>
<tr>
<td>CashFlow/Assets</td>
<td>0.029 (0.049)</td>
<td>0.054 (0.064)</td>
<td>0.049 (0.057)</td>
<td>0.153 (0.232)</td>
<td>0.011 (0.045)</td>
<td>0.058 (0.063)</td>
<td>-0.089 (0.062)</td>
<td>-0.180 (0.200)</td>
</tr>
<tr>
<td>Dividends/Assets</td>
<td>1.174 (1.108)</td>
<td>0.610 (0.695)</td>
<td>3.710** (1.495)</td>
<td>-0.420 (1.439)</td>
<td>1.201 (0.991)</td>
<td>0.593 (0.702)</td>
<td>3.420** (1.550)</td>
<td>-0.533 (1.200)</td>
</tr>
<tr>
<td>Log(Assets)</td>
<td>0.025 (0.065)</td>
<td>0.110*** (0.042)</td>
<td>0.017 (0.097)</td>
<td>0.031 (0.108)</td>
<td>0.068 (0.070)</td>
<td>0.108** (0.043)</td>
<td>-0.013 (0.103)</td>
<td>0.233** (0.068)</td>
</tr>
<tr>
<td>AssetTurnover</td>
<td>0.036 (0.073)</td>
<td>-0.025 (0.038)</td>
<td>0.101 (0.076)</td>
<td>0.034 (0.093)</td>
<td>0.000 (0.061)</td>
<td>-0.022 (0.038)</td>
<td>-0.077 (0.078)</td>
<td>0.051 (0.068)</td>
</tr>
<tr>
<td>MarketToBook</td>
<td>-0.016 (0.017)</td>
<td>-0.010 (0.011)</td>
<td>-0.023 (0.025)</td>
<td>-0.006 (0.038)</td>
<td>-0.028 (0.018)</td>
<td>-0.006 (0.011)</td>
<td>-0.032 (0.026)</td>
<td>0.003 (0.030)</td>
</tr>
<tr>
<td>TangibleAssetRatio</td>
<td>-0.641*** (0.239)</td>
<td>-0.118 (0.161)</td>
<td>0.622 (0.291)</td>
<td>0.089 (0.327)</td>
<td>-0.589*** (0.222)</td>
<td>-0.124 (0.162)</td>
<td>0.608** (0.307)</td>
<td>0.047 (0.253)</td>
</tr>
<tr>
<td>Capex/Assets</td>
<td>-0.310 (0.405)</td>
<td>-0.406 (0.257)</td>
<td>-0.272 (0.384)</td>
<td>-0.089 (0.586)</td>
<td>-0.329 (0.409)</td>
<td>-0.389 (0.256)</td>
<td>-0.148 (0.392)</td>
<td>-0.029 (0.473)</td>
</tr>
<tr>
<td>Log(Employees)</td>
<td>-0.193*** (0.048)</td>
<td>-0.366*** (0.031)</td>
<td>-0.213*** (0.062)</td>
<td>-0.264*** (0.080)</td>
<td>-0.193*** (0.047)</td>
<td>-0.364*** (0.031)</td>
<td>-0.212 (0.062)</td>
<td>-0.262*** (0.042)</td>
</tr>
<tr>
<td>Hours/Employee</td>
<td>-0.000*** (0.000)</td>
<td>-0.001*** (0.000)</td>
<td>-0.000*** (0.000)</td>
<td>-0.000*** (0.000)</td>
<td>-0.001*** (0.000)</td>
<td>-0.000*** (0.000)</td>
<td>-0.000*** (0.000)</td>
<td>-0.000*** (0.000)</td>
</tr>
<tr>
<td>Observations</td>
<td>8,785</td>
<td>8,785</td>
<td>3,796</td>
<td>3,796</td>
<td>8,785</td>
<td>8,785</td>
<td>3,796</td>
<td>3,796</td>
</tr>
<tr>
<td>Log Likelihood</td>
<td>-18,169</td>
<td>8,785</td>
<td>-6,238</td>
<td>3,796</td>
<td>-17,989</td>
<td>8,785</td>
<td>12,233</td>
<td>8,785</td>
</tr>
<tr>
<td>Adjusted R2</td>
<td>-0.150</td>
<td>-6,238</td>
<td>0.0828</td>
<td>3,796</td>
<td>-17,989</td>
<td>8,785</td>
<td>0.1223</td>
<td>8,785</td>
</tr>
</tbody>
</table>
Table 11: Workplace injuries and debt maturity during the financial crisis

This table presents estimates of the effect of having a large quantity of debt maturing at the onset of the financial crisis on injury rates. The first and third columns show results from establishment fixed effects Poisson regressions, where the dependent variable is the number of injuries reported at an establishment in a given year, and the number of hours worked at the establishment during the year is specified as an exposure variable. The second and fourth columns show results from establishment fixed effects OLS regressions, where the dependent variable is $\log([\text{Injuries} + 1]/\text{HoursWorked})$. All regressions include industry-year and state-year dummies. The sample period is 2006-2008. Regressions shown in columns (1) and (2) use all establishments appearing in the sample at least once in 2006-2007 and also appearing in 2008. Regressions in columns (3) and (4) use a propensity score-matched sample. Crisis is defined as an indicator variable taking a value of one in 2008 and zero in preceding years. HighDebtDue is an indicator variable taking a value of one if a firm’s debt maturing within one year as of fiscal year end 2007 as a percentage of assets exceeds the 75th percentile for the sample (3.064%) and zero otherwise. Only firms whose 2007 fiscal year end fell between August 2007 and January 2008 are included in the sample. Debt/Assets, Cash/Assets, Log(Assets), MarketToBook, and TangibleAssetRatio are lagged one year, while CashFlow/Assets, Dividends/Assets, AssetTurnover, Capex/Assets, Log(Employee), and Hours/Employee are measured contemporaneously. See Table 2 for definitions of these variables. Standard errors clustered at the firm level are reported in parentheses below each point estimate. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively, based on a two-tailed z-test.

<table>
<thead>
<tr>
<th>Sample</th>
<th>Poisson</th>
<th>Full sample</th>
<th>OLS</th>
<th>Poisson</th>
<th>OLS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crisis * HighDebtDue</td>
<td>0.086**</td>
<td>0.014</td>
<td>0.068***</td>
<td>0.075*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.037)</td>
<td>(0.031)</td>
<td>(0.035)</td>
<td>(0.043)</td>
<td></td>
</tr>
<tr>
<td>Debt/Assets</td>
<td>-0.036</td>
<td>-0.070</td>
<td>-0.492***</td>
<td>-0.455</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.113)</td>
<td>(0.114)</td>
<td>(0.192)</td>
<td>(0.262)</td>
<td></td>
</tr>
<tr>
<td>Cash/Assets</td>
<td>-0.109</td>
<td>-0.004</td>
<td>-0.914***</td>
<td>0.678</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.155)</td>
<td>(0.094)</td>
<td>(0.304)</td>
<td>(0.426)</td>
<td></td>
</tr>
<tr>
<td>CashFlow/Assets</td>
<td>-0.048</td>
<td>0.095</td>
<td>0.276</td>
<td>0.046</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.099)</td>
<td>(0.091)</td>
<td>(0.181)</td>
<td>(0.364)</td>
<td></td>
</tr>
<tr>
<td>Dividends/Assets</td>
<td>-0.288</td>
<td>-0.889</td>
<td>5.284***</td>
<td>0.122</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.897)</td>
<td>(0.758)</td>
<td>(2.558)</td>
<td>(2.139)</td>
<td></td>
</tr>
<tr>
<td>Log(Assets)</td>
<td>0.078</td>
<td>0.064</td>
<td>-0.314***</td>
<td>0.206</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.051)</td>
<td>(0.060)</td>
<td>(0.103)</td>
<td>(0.172)</td>
<td></td>
</tr>
<tr>
<td>AssetTurnover</td>
<td>0.018</td>
<td>0.054</td>
<td>-0.236***</td>
<td>-0.092</td>
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</tr>
<tr>
<td></td>
<td>(0.044)</td>
<td>(0.041)</td>
<td>(0.062)</td>
<td>(0.143)</td>
<td></td>
</tr>
<tr>
<td>MarketToBook</td>
<td>-0.007</td>
<td>-0.005</td>
<td>0.005</td>
<td>-0.041</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.019)</td>
<td>(0.013)</td>
<td>(0.036)</td>
<td>(0.054)</td>
<td></td>
</tr>
<tr>
<td>TangibleAssetRatio</td>
<td>0.235</td>
<td>0.381</td>
<td>-0.460*</td>
<td>-0.744</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.261)</td>
<td>(0.242)</td>
<td>(0.268)</td>
<td>(0.731)</td>
<td></td>
</tr>
<tr>
<td>Capex/Assets</td>
<td>-0.942</td>
<td>-0.316</td>
<td>-1.269***</td>
<td>-1.649***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.608)</td>
<td>(0.278)</td>
<td>(0.422)</td>
<td>(0.501)</td>
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</tr>
<tr>
<td>Log(Employee)</td>
<td>-0.112</td>
<td>-0.376***</td>
<td>-0.159</td>
<td>-0.309*</td>
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</tr>
<tr>
<td></td>
<td>(0.074)</td>
<td>(0.052)</td>
<td>(0.109)</td>
<td>(0.146)</td>
<td></td>
</tr>
<tr>
<td>Hours/Employee</td>
<td>-0.000***</td>
<td>-0.000***</td>
<td>-0.000***</td>
<td>-0.000***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>6,792</td>
<td>6,792</td>
<td>2,300</td>
<td>2,300</td>
<td></td>
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<tr>
<td>Log Likelihood</td>
<td>-11,052</td>
<td>0.0587</td>
<td>2,896</td>
<td>0.1010</td>
<td></td>
</tr>
<tr>
<td>Adjusted R2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 12: Workplace injuries and debt maturity during the financial crisis: characteristic-by-characteristic matching

This table presents estimates of the effect of having a large quantity of debt maturing at the onset of the financial crisis on injury rates using a series of samples matched on individual firm or establishment characteristics. The first column identifies the matching characteristic. The second shows the mean value of the characteristic for firms in the treated group (\(\text{HighDebtDue} = 1\)). The third shows the mean value of the characteristic for firms in the untreated group (\(\text{HighDebtDue} = 0\)). The third column shows the t-statistic from a t-test of the difference in means. The fourth and fifth columns show the coefficient on \(\text{Crisis} \times \text{HighDebtDue}\) and its standard error clustered at the firm level from estimating the Poisson fixed effects regression used in the odd-numbered columns in Table 11. Injury rate trend is the annualized pre-2008 change in the portion of an establishment’s injury rate not explained by other firm and establishment characteristics. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively, based on a two-tailed z-test.

### Panel A: Matching by establishment/firm characteristic

<table>
<thead>
<tr>
<th>Matched characteristic</th>
<th>Characteristic mean</th>
<th>Crisis (\times) HighDebtDue</th>
<th>(t_{diff})</th>
<th>Coeff</th>
<th>Std Err</th>
</tr>
</thead>
<tbody>
<tr>
<td>Debt/Assets</td>
<td>0.317</td>
<td>0.317</td>
<td>0.041</td>
<td>0.160***</td>
<td>(0.049)</td>
</tr>
<tr>
<td>Cash/Assets</td>
<td>0.076</td>
<td>0.077</td>
<td>0.066</td>
<td>0.150***</td>
<td>(0.045)</td>
</tr>
<tr>
<td>CashFlow/Assets</td>
<td>0.118</td>
<td>0.116</td>
<td>0.407</td>
<td>0.117**</td>
<td>(0.048)</td>
</tr>
<tr>
<td>Dividends/Assets</td>
<td>0.013</td>
<td>0.013</td>
<td>0.031</td>
<td>0.244***</td>
<td>(0.049)</td>
</tr>
<tr>
<td>Log(Assets)</td>
<td>9.187</td>
<td>9.185</td>
<td>0.019</td>
<td>0.204***</td>
<td>(0.038)</td>
</tr>
<tr>
<td>AssetTurnover</td>
<td>1.635</td>
<td>1.634</td>
<td>0.040</td>
<td>0.163***</td>
<td>(0.045)</td>
</tr>
<tr>
<td>MarketToBook</td>
<td>1.508</td>
<td>1.506</td>
<td>0.043</td>
<td>0.088**</td>
<td>(0.037)</td>
</tr>
<tr>
<td>TangibleAssetRatio</td>
<td>0.443</td>
<td>0.442</td>
<td>0.038</td>
<td>0.021</td>
<td>(0.045)</td>
</tr>
<tr>
<td>Capex/Assets</td>
<td>0.075</td>
<td>0.076</td>
<td>0.072</td>
<td>0.073</td>
<td>(0.053)</td>
</tr>
<tr>
<td>Log(Employees)</td>
<td>5.350</td>
<td>5.349</td>
<td>0.008</td>
<td>0.126***</td>
<td>(0.045)</td>
</tr>
<tr>
<td>Hours/Employee</td>
<td>1,757</td>
<td>1,757</td>
<td>0.002</td>
<td>0.142***</td>
<td>(0.036)</td>
</tr>
</tbody>
</table>

### Panel B: Matching on pre-treatment unexplained injury rate

<table>
<thead>
<tr>
<th>Matched characteristic</th>
<th>Characteristic mean</th>
<th>Crisis (\times) HighDebtDue</th>
<th>(t_{diff})</th>
<th>Coeff</th>
<th>Std Err</th>
</tr>
</thead>
<tbody>
<tr>
<td>Injury rate trend</td>
<td>0.0013</td>
<td>0.0013</td>
<td>0.048</td>
<td>0.070**</td>
<td>(0.034)</td>
</tr>
</tbody>
</table>
Table 13: Workplace injuries and oil price shocks

This table presents estimates of the effect of oil price shocks on injury rates. Odd-numbered columns show results from establishment fixed effects Poisson regressions, where the dependent variable is the number of injuries reported at an establishment in a given year, and the number of hours worked at the establishment during the year is specified as an exposure variable. Even-numbered columns show results from establishment fixed effects OLS regressions, where the dependent variable is log((Injuries + 1)/HoursWorked). All regressions include industry-year and state-year dummies. Regressions shown in columns (1), (2), (5), and (6) use all establishments appearing in the sample at least twice. Regressions in columns (3), (4), (7), and (8) use a propensity score-matched sample. Both samples consist only of non-oil producing establishments. \(OilExposed\) is an indicator variable taking a value of one if an establishment’s parent firm is in the oil business (either has an oil-producing establishment in the BLS data in any year in the sample or is identified by Capital IQ as being in the oil, gas, and consumable fuels business, excluding coal mining). \(OilPrice\) is the natural log of the price of oil. \(Debt/Assets, Cash/Assets, Log(Assets), MarketToBook,\) and \(TangibleAssetRatio\) are lagged one year, while \(CashFlow/Assets, Dividends/Assets, AssetTurnover, Capex/Assets, Log(employees),\) and \(Hours/Employee\) are measured contemporaneously. See Table 2 for definitions of these variables. Standard errors clustered at the firm level are reported in parentheses below each point estimate. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively, based on a two-tailed z-test.

<table>
<thead>
<tr>
<th>Sample</th>
<th>Full sample</th>
<th>Propensity-matched</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Poisson</td>
<td>OLS</td>
</tr>
<tr>
<td>OilExposed * OilPrice</td>
<td>-0.362*** (0.098)</td>
<td>-0.175** (0.081)</td>
</tr>
<tr>
<td>Debt/Assets * OilExposed</td>
<td>4.292 (3.572)</td>
<td>-0.998 (2.786)</td>
</tr>
<tr>
<td>Debt/Assets * OilPrice</td>
<td>0.074 (0.058)</td>
<td>0.109** (0.048)</td>
</tr>
<tr>
<td>Debt/Assets * OilExposed</td>
<td>0.047 (0.274)</td>
<td>0.021 (0.048)</td>
</tr>
<tr>
<td>Log(Assets)</td>
<td>0.038 (0.044)</td>
<td>0.059** (0.024)</td>
</tr>
<tr>
<td>AssetTurnover</td>
<td>0.047 (0.031)</td>
<td>0.201 (0.020)</td>
</tr>
<tr>
<td>MarketToBook</td>
<td>-0.036*** (0.013)</td>
<td>-0.012* (0.006)</td>
</tr>
<tr>
<td>TangibleAssetRatio</td>
<td>-0.118 (0.199)</td>
<td>0.222** (0.102)</td>
</tr>
<tr>
<td>Capex/Assets</td>
<td>-0.631*** (0.256)</td>
<td>-0.304* (0.165)</td>
</tr>
<tr>
<td>Log(Employee)</td>
<td>-0.110*** (0.038)</td>
<td>-0.354*** (0.020)</td>
</tr>
<tr>
<td>Hours/Employee</td>
<td>-0.000*** (0.000)</td>
<td>-0.000*** (0.000)</td>
</tr>
<tr>
<td>Observations</td>
<td>24,925 (24,925)</td>
<td>1,096 (1,096)</td>
</tr>
<tr>
<td>Log Likelihood</td>
<td>-52,159 (24,925)</td>
<td>-2,355 (1,096)</td>
</tr>
</tbody>
</table>

Adjusted R2 0.1118 0.4028 0.1123 0.4075
Table 14: Firm value and workplace injuries

This table presents results from OLS regressions of firm value on injury rates. The dependent variable in each model is a firm’s Tobin’s Q for the given year, where Tobin’s Q is calculated as the sum of the market value of equity and book value of debt less deferred taxes, divided by total assets. *LaggedInjuries/Hour* and *LaggedInjuries/Hour* are injuries per hour worked the year before and year after, respectively, across all of a firm’s establishments in the BLS data, multiplied by 1,000. See Table 2 for definitions of all of the other explanatory variables. *Debt/Assets, Cash/Assets, Log(Assets), MarketToBook,* and *TangibleAssetRatio* are lagged one year, while *CashFlow/Assets, Dividends/Assets, AssetTurnover, Capex/Assets, Log(Employees),* and *Hours/Employee* are measured contemporaneously. All regressions include firm and year fixed effects. Standard errors clustered at the firm level are reported in parentheses below each point estimate. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively, based on a two-tailed t-test.

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LaggedInjuries/Hour</td>
<td>-3.190***</td>
<td>-2.715**</td>
<td>-3.524**</td>
<td>-3.079**</td>
</tr>
<tr>
<td></td>
<td>(1.164)</td>
<td>(1.129)</td>
<td>(1.452)</td>
<td>(1.369)</td>
</tr>
<tr>
<td>LeadInjuries/Hours</td>
<td>-0.414</td>
<td>-0.036</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.950)</td>
<td>(0.871)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Debt/Assets</td>
<td>-0.047</td>
<td>0.448*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.438)</td>
<td>(0.251)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cash/Assets</td>
<td>0.511***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.192)</td>
<td>(0.292)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CashFlow/Assets</td>
<td>0.636</td>
<td>1.281***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.501)</td>
<td>(0.319)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dividends/Assets</td>
<td>0.353</td>
<td>0.008</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1.198)</td>
<td>(1.464)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Log(Assets)</td>
<td>-0.476***</td>
<td>-0.383***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.132)</td>
<td>(0.107)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AssetTurnover</td>
<td>0.106</td>
<td>0.025</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.102)</td>
<td>(0.098)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TangibleAssetRatio</td>
<td>-0.891*</td>
<td>-2.032***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.470)</td>
<td>(0.687)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capex/Assets</td>
<td>0.709**</td>
<td>1.312***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.352)</td>
<td>(0.489)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>4,469</td>
<td>4,469</td>
<td>2,843</td>
<td>2,843</td>
</tr>
<tr>
<td>Adjusted R2</td>
<td>0.1000</td>
<td>0.1571</td>
<td>0.1308</td>
<td>0.2021</td>
</tr>
</tbody>
</table>

52
Figure 1: Distribution of Establishment Sizes

This figure presents the distribution of establishments by number of employees or full-time equivalents for each establishment observation.
Figure 2: Distributions of injury rates and injury counts

This figure presents histograms showing the distribution of Injuries/Employee (top portion of the figure) and number of Injuries (bottom portion). To avoid revealing information about specific establishments, the x-axis is left intentionally unlabeled.
Figure 3: Kernel regression of injury rate on leverage

This figure plots kernel-weighted local polynomial smooths of the relation between \( \text{Injuries/Hour} \) and \( \text{Debt/Assets} \) using the epanechnikov kernel and a bandwidth of 0.1. Cases where \( \text{Debt/Assets} \leq 1 \) are excluded for ease of interpretation.
This figure shows the portion of injury rates not explained by other observable firm- and establishment-specific variables over time for the full sample of firms with and without foreign profits as of the AJCA (2004). These unexplained injury rates are the residuals from an OLS regression of Injuries/Hour (times 1,000) on various firm and establishment characteristics. The green line shows the mean unexplained injury rate for establishments belonging to firms reporting positive cumulative foreign profits over the period 2001-2003. The blue line shows the mean unexplained injury rate for establishments belonging to firms reporting zero or negative cumulative foreign profits over this period.
This figure shows the portion of injury rates not explained by other observable firm- and establishment-specific variables over time for the propensity score-matched sample of firms with and without foreign profits as of the AJCA (2004). These unexplained injury rates are the residuals from an OLS regression of $Injuries/\text{Hour}$ (times 1,000) on various firm and establishment characteristics. The green line shows the mean unexplained injury rate for establishments belonging to firms reporting positive cumulative foreign profits over the period 2001-2003. The blue line shows the mean unexplained injury rate for establishments belonging to firms reporting zero or negative cumulative foreign profits over this period.
This figure shows the portion of injury rates not explained by other observable firm- and establishment-specific variables over time for the full sample of firms with and without a large quantity of debt maturing within one year as of fiscal year end 2007. These unexplained injury rates are the residuals from an OLS regression of Injuries/Hour (times 1,000) on various firm and establishment characteristics. A firm is defined as having a large quantity of debt due within the next year if debt due within one year as of fiscal year end 2007 as a percentage of assets exceeds the 75th percentile for the sample (3.064%). The green line shows the mean unexplained injury rate for establishments belonging to firms with a large quantity of debt maturing within the next year. The blue line shows the mean unexplained injury rate for establishments belonging to firms with little debt maturing within the next year.
Figure 7: Injury rates over time by debt maturity status - matched sample

This figure shows the portion of injury rates not explained by other observable firm- and establishment-specific variables over time for the propensity score-matched sample of firms with and without a large quantity of debt maturing within one year as of fiscal year end 2007. These unexplained injury rates are the residuals from an OLS regression of $Injuries/Hour$ (times 1,000) on various firm and establishment characteristics. A firm is defined as having a large quantity of debt due within the next year if debt due within one year as of fiscal year end 2007 as a percentage of assets exceeds the 75th percentile for the sample (3.064%). The green line shows the mean unexplained injury rate for establishments belonging to firms with a large quantity of debt maturing within the next year. The blue line shows the mean unexplained injury rate for establishments belonging to firms with little debt maturing within the next year.
A Appendix: Simulations

This appendix presents results from estimating various models on simulated injury data designed to have similar properties to the injury data we use in our analysis. We conduct this analysis for both the general empirical determinants on injury rates (the subject of Section 3) and the quasi-natural experiments (the subject of Section 4). We simulate injury count data in both cases using a negative binomial model to allow for possible overdispersion in the data.

For the general determinants of injury rates analysis, we focus on the relation between injury rates and leverage, as this is the most robust result from that analysis. We begin by estimating a simple univariate negative binomial model of injuries on lagged Debt/Assets, with HoursWorked as the exposure variable, using the actual data. That is, we estimate:

\[ y_{it} \sim \text{Poisson}(\lambda^*_{it}) \]
\[ \lambda^*_{it} = \exp(\delta + \beta x_{it} + \text{exposure}_{it} + \epsilon_{it}) \]
\[ e^{\epsilon_{it}} \sim \text{Gamma}(1/\alpha, \alpha), \]

The estimates are \( \delta = 10.601, \beta = 0.359, \) and \( \alpha = 1.054. \) We then use these estimates as parameters in the negative binomial data-generating model, which we use to generate 43,731 simulated observations, the same number as we use in the tests in Table 6. Each simulated “observation” consists of a number of hours worked, Debt/Assets, and simulated number of injuries. We construct these observations in two different ways. In the first, we use the combination of hours worked and Debt/Assets from the actual data. In the second, we use the number of hours worked from the data but draw Debt/Assets from an exponential distribution with parameter \( \lambda \) chosen so that the variance of Debt/Assets in the data-generating process matches the variance of Debt/Assets in the actual data. We
refer to these approaches as the "Actual Exposure" and "Simulated Exposure" approaches, respectively. We simulate 10,000 datasets using each of the two approaches.

We then estimate bivariate negative binomial, Poisson, and OLS models using each simulated dataset. The explanatory variable in each is \( \text{Debt/Assets} \). As in the analysis in the paper, the dependent variable in the negative binomial and Poisson models is the number of injuries, and the dependent variable in the OLS model is the log-transformed injury rate, i.e., \( \log[(\text{Injuries}_{it} + 1)/\text{Hours}_{it}] \). We specify hours worked as the exposure variable in the negative binomial and Poisson models. We capture the estimated coefficient on \( \text{Debt/Assets} \) in each of the three models. For each combination of simulation approach and model, this gives us 10,000 coefficient estimates.

The top portion of Table A.1 labeled "Determinants Regressions," presents the mean and standard deviation of each estimate. The left-hand side shows these statistics for the Actual Exposure approach and the right-hand side shows them for the Simulated Exposure approach. The first row shows the "true" coefficient as input into the data-generating model. The second, third, and fourth rows show the mean and standard deviation of the coefficient for the negative binomial, Poisson, and OLS models, respectively.

The remainder of the table shows results from simulations of the three quasi-natural experiments that are the subject of Section 4. We follow a similar approach to the one described above in this simulation analysis. The difference is that the dependent variables in the data-generating model are the treated indicator (positive foreign profits, high debt due, oil price exposure) and the treatment variable (post-AJCA, post-crisis onset, log oil price) from a given experiment, and the interaction of the two. We estimate a negative binomial model using the actual data and these explanatory variables to obtain the parameters that we feed into the data-generating model.

The Actual Exposure approach here entails using the actual treated and treatment status of the observations in the data. The Simulated Exposure approach entails randomly
assigning establishments to the treated and untreated groups with probabilities based on the proportion of treated and untreated establishments in the actual data. For the oil price experiment, when using the Simulated Exposure approach, we assume that the log oil price starts in 2002 at its actual value of 3.263 (actual price of $26.11), and then changes each year by a random amount drawn from a normal distribution with mean and variance equal to the sample mean (0.123) and variance (0.279) over the period. For each experiment, we simulate datasets that are the same size as those used in the analysis in the paper. In each case, we conduct our analysis on both the full dataset and on the propensity score-matched dataset.
Table A.1: Performance of Estimators in Simulations

<table>
<thead>
<tr>
<th>Model</th>
<th>Actual Exposure</th>
<th>Simulated Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Std. Dev.</td>
</tr>
<tr>
<td>Actual</td>
<td>0.3502</td>
<td>Actual</td>
</tr>
<tr>
<td>Negative Binomial</td>
<td>0.3501</td>
<td>0.0300</td>
</tr>
<tr>
<td>Poisson</td>
<td>0.3492</td>
<td>0.0958</td>
</tr>
<tr>
<td>OLS</td>
<td>-0.0259</td>
<td>0.0214</td>
</tr>
</tbody>
</table>

AJCA Full Sample

| Actual | -0.0722 | Actual | -0.0722 |
| Negative Binomial | -0.0720 | 0.0336 | Negative Binomial | -0.0721 | 0.0339 |
| Poisson | -0.0710 | 0.1065 | Poisson | -0.0705 | 0.1026 |
| OLS | -0.1113 | 0.0257 | OLS | -0.0490 | 0.0287 |

AJCA Propensity-Matched

| Actual | -0.0190 | Actual | -0.0190 |
| Negative Binomial | -0.0192 | 0.0661 | Negative Binomial | -0.0188 | 0.0661 |
| Poisson | -0.0179 | 0.1561 | Poisson | -0.0196 | 0.1539 |
| OLS | -0.0219 | 0.0654 | OLS | -0.0110 | 0.0656 |

Financial Crisis Full Sample

| Actual | -0.0244 | Actual | -0.0244 |
| Negative Binomial | -0.0253 | 0.0478 | Negative Binomial | -0.0246 | 0.0496 |
| Poisson | -0.0236 | 0.1436 | Poisson | -0.0217 | 0.1605 |
| OLS | -0.0391 | 0.0395 | OLS | -0.0213 | 0.0430 |

Financial Crisis Propensity-Matched

| Actual | -0.0580 | Actual | -0.0580 |
| Negative Binomial | -0.0587 | 0.0816 | Negative Binomial | -0.0577 | 0.0811 |
| Poisson | -0.0552 | 0.1929 | Poisson | -0.0564 | 0.1832 |
| OLS | -0.0330 | 0.0787 | OLS | -0.0456 | 0.0791 |

Oil Experiment Full Sample

| Actual | -0.2800 | Actual | -0.2800 |
| Negative Binomial | -0.2782 | 0.1082 | Negative Binomial | -0.2802 | 0.1623 |
| Poisson | -0.2751 | 0.1571 | Poisson | -0.2807 | 0.2406 |
| OLS | -0.0291 | 0.0793 | OLS | -0.0946 | 0.1702 |

Oil Experiment Propensity-Matched

| Actual | -0.3028 | Actual | -0.3028 |
| Negative Binomial | -0.3019 | 0.1859 | Negative Binomial | -0.3043 | 0.2728 |
| Poisson | -0.3054 | 0.2961 | Poisson | -0.3070 | 0.4482 |
| OLS | -0.2651 | 0.1687 | OLS | -0.2202 | 0.2739 |
B Appendix: Employment changes around the AJCA

To test whether employment grew in a firm’s establishments in safer industries relative to its establishments in more dangerous industries after 2004 if it had positive foreign profits, we form a sample of all establishments that are in the data at least once in each of the pre- and post-AJCA periods. For each establishment, we compute the annualized percent change in employment from the pre- to post-AJCA period. For pre-AJCA employment, we use an establishment’s 2003 employment if it is available and 2002 if is not. For the post-AJCA period, we use 2005 employment if it is available and 2006 if it is not. We then divide establishments into more or less dangerous establishments depending on whether an establishment’s industry mean injury rate is above or below the median industry mean injury rate for all of the parent firm’s establishments in the sample. Table B.1 presents the mean percent change in employment around the AJCA in more and less dangerous establishments separately for firms with and without cumulative foreign profits over 2001-2003.

— Insert Table B.1 here —

Firms with foreign profits actually appear to reduce employment in safer establishments more than in dangerous establishments after 2004, both in absolute terms and relative to firms without foreign profits, though the differences are not statistically significant. While this does not rule out the possibility of a differential shift in productive activities, such a shift would have to have occurred only within establishments and not (to a detectable degree) across establishments. The lack of an increase in employment overall is consistent with existing conclusions that, despite its intent, the AJCA failed to actually create jobs ()

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26If a firm has an odd number of establishments in the data both before and after the AJCA, we discard the establishment with the median industry median injury rate.
Table B.1: Injury risk profile changes around the American Jobs Creation Act

The table shows the mean percent change in employment in more and less dangerous establishments from 2002-2003 (pre-AJCA) to 2005-2006 (post-AJCA) separately for firms with and without foreign profits at the time of the AJCA. We form a sample of all establishments that are in the data at least once in each of the pre- and post-AJCA periods. For each establishment, we compute the annualized percent change in employment from the pre- to post-AJCA period, using 2003 employment if it is available and 2002 if is not, and using 2005 employment if it is available and 2006 if it is not. We divide establishments into more or less dangerous establishments depending on whether an establishment’s industry mean injury rate is above or below the median industry mean injury rate for all of the parent firm’s establishments in the sample. Those with rates equal to the median of their parent firm are removed from the sample. Differences in percent changes for firms with and without foreign profits are shown to the right. Below them is the difference in these differential changes, with a t-statistic shown in parentheses.

<table>
<thead>
<tr>
<th></th>
<th>Employment change %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>More Dangerous</td>
</tr>
<tr>
<td>ForProf&gt;0</td>
<td>-0.3%</td>
</tr>
<tr>
<td>ForProf≤0</td>
<td>-2.4%</td>
</tr>
<tr>
<td>Difference</td>
<td></td>
</tr>
</tbody>
</table>

(1.52)
C Appendix: Supplemental tables
Table C.1: Workplace injuries and the American Jobs Creation Act - matching within industry

This table presents estimates of the effect of the American Jobs Creation Act of 2004 on injury rates. Odd-numbered columns show results from establishment fixed effects Poisson regressions, where the dependent variable is the number of injuries reported at an establishment in a given year, and the number of hours worked at the establishment during the year is specified as an exposure variable. Even-numbered columns show results from establishment fixed effects OLS regressions, where the dependent variable is $\log((\text{Injuries} + 1)/\text{HoursWorked})$. All regressions include industry-year and state-year dummies. Only observations in 2002, 2003, 2005 and 2006 are used in the regressions. The sample is a propensity score-matched sample, where matches must be from the same industry. Post2004 is an indicator variable taking a value of one in years 2005 and 2006 and zero in years 2002 and 2003. PosFP is an indicator taking a value of one if the parent firm’s cumulative reported foreign profits in 2001-2003 were positive, and zero otherwise. Debt/Assets, Cash/Assets, Log(Assets), MarketToBook, and TangibleAssetRatio are lagged one year, while CashFlow/Assets, Dividends/Assets, AssetTurnover, Capex/Assets, Log(Employees), and Hours/Employee are measured contemporaneously. See Table 2 for definitions of these variables. Standard errors clustered at the firm level are reported in parentheses below each point estimate. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively, based on a two-tailed z-test.

<table>
<thead>
<tr>
<th></th>
<th>Poisson</th>
<th>OLS</th>
<th>Poisson</th>
<th>OLS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Post2004 * PosFP</strong></td>
<td>-0.074**</td>
<td>-0.131*</td>
<td>0.275***</td>
<td>0.022</td>
</tr>
<tr>
<td></td>
<td>(0.034)</td>
<td>(0.075)</td>
<td>(0.076)</td>
<td>(0.144)</td>
</tr>
<tr>
<td><strong>Debt/Assets * Post2004</strong></td>
<td>0.837***</td>
<td>-0.147</td>
<td>-1.536***</td>
<td>-3.343*</td>
</tr>
<tr>
<td></td>
<td>(0.180)</td>
<td>(0.430)</td>
<td>(0.494)</td>
<td>(1.731)</td>
</tr>
<tr>
<td><strong>Debt/Assets * PosFP</strong></td>
<td>-1.726***</td>
<td>-0.305</td>
<td>-1.726***</td>
<td>-0.305</td>
</tr>
<tr>
<td></td>
<td>(0.300)</td>
<td>(0.485)</td>
<td>(0.300)</td>
<td>(0.485)</td>
</tr>
<tr>
<td>Debt/Assets</td>
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<td>1.633***</td>
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<td>(0.907)</td>
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<td>1.302**</td>
<td>1.790***</td>
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<td>(0.507)</td>
<td>(0.238)</td>
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<td>(0.100)</td>
<td>(0.149)</td>
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<td>0.251</td>
<td>0.136*</td>
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<td>(0.074)</td>
<td>(0.160)</td>
<td>(0.075)</td>
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<td>-0.004</td>
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<td>(0.523)</td>
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<td>(0.554)</td>
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<td>Log(Employees)</td>
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<td>-0.001***</td>
<td>-0.000</td>
<td>-0.001***</td>
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</table>

67
Table C.2: Workplace injuries and debt maturity during the financial crisis - matching within industry

This table presents estimates of the effect of having a large quantity of debt maturing at the onset of the financial crisis on injury rates. Odd-numbered columns show results from establishment fixed effects Poisson regressions, where the dependent variable is the number of injuries reported at an establishment in a given year, and the number of hours worked at the establishment during the year is specified as an exposure variable. Even-numbered columns show results from establishment fixed effects OLS regressions, where the dependent variable is $\log((\text{Injuries} + 1)/\text{HoursWorked})$. All regressions include industry-year and state-year dummies. The sample period is 2006-2008. The sample is a propensity score-matched sample, where matches must be from the same industry. \textit{Crisis} is defined as an indicator variable taking a value of one in 2008 and zero in preceding years. \textit{HighDebtDue} is an indicator variable taking a value of one if a firm’s debt maturing within one year as of fiscal year end 2007 as a percentage of assets exceeds the 75th percentile for the sample (3.064%) and zero otherwise. Only firms whose 2007 fiscal year end fell between August 2007 and January 2008 are included in the sample. \textit{Debt/Assets}, \textit{Cash/Assets}, \textit{Log(Assets)}, \textit{MarketToBook}, and \textit{TangibleAssetRatio} are lagged one year, while \textit{CashFlow/Assets}, \textit{Dividends/Assets}, \textit{AssetTurnover}, \textit{Capex/Assets}, \textit{Log(Employees)}, and \textit{Hours/Employee} are measured contemporaneously. See Table 2 for definitions of these variables. Standard errors clustered at the firm level are reported in parentheses below each point estimate. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively, based on a two-tailed z-test.

<table>
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<tr>
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<th>Poisson</th>
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</tr>
</thead>
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<td>Crisis * HighDebtDue</td>
<td>0.140***</td>
<td>0.205</td>
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<tr>
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<td>(0.047)</td>
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<tr>
<td>Debt/Assets</td>
<td>-0.034</td>
<td>-0.292</td>
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<tr>
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<td>(0.273)</td>
<td>(0.406)</td>
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<tr>
<td>Cash/Assets</td>
<td>0.137</td>
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<tr>
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<td>(0.302)</td>
<td>(0.537)</td>
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<td>CashFlow/Assets</td>
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<td>(0.428)</td>
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<td>Dividends/Assets</td>
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<td>(2.032)</td>
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<tr>
<td>AssetTurnover</td>
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<td>0.285*</td>
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<td>(0.157)</td>
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<td>Capex/Assets</td>
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<td>(0.815)</td>
<td>(1.873)</td>
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<tr>
<td>Log(Employees)</td>
<td>0.720***</td>
<td>0.222***</td>
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<tr>
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<td>(0.108)</td>
<td>(0.086)</td>
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<tr>
<td>Hours/Employee</td>
<td>0.000***</td>
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<td>Adjusted R2</td>
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</table>
Table C.3: Workplace injuries and oil price shocks - matching within industry

This table presents estimates of the effect of oil price shocks on injury rates. Odd-numbered columns show results from establishment fixed effects Poisson regressions, where the dependent variable is the number of injuries reported at an establishment in a given year, and the number of hours worked at the establishment during the year is specified as an exposure variable. Even-numbered columns show results from establishment fixed effects OLS regressions, where the dependent variable is $\log((\text{Injuries} + 1)/\text{HoursWorked})$. All regressions include industry-year and state-year dummies. The sample is a propensity score-matched sample, where matches must be from the same industry. Both samples consist only of non-oil producing establishments. $\text{OilExposed}$ is an indicator variable taking a value of one if an establishment’s parent firm is in the oil business (either has an oil-producing establishment in any year in the sample or is identified by Capital IQ as being in the oil, gas, and consumable fuels business, excluding coal mining). $\text{OilPrice}$ is the natural log of the price of oil. $\text{Debt/Assets}$, $\text{Cash/Assets}$, $\text{Log(Assets)}$, $\text{MarketToBook}$, and $\text{TangibleAssetRatio}$ are lagged one year, while $\text{CashFlow/Assets}$, $\text{Dividends/Assets}$, $\text{AssetTurnover}$, $\text{Capex/Assets}$, $\text{Log(employees)}$, and $\text{Hours/Employee}$ are measured contemporaneously. See Table 2 for definitions of these variables. Standard errors clustered at the firm level are reported in parentheses below each point estimate. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively, based on a two-tailed z-test.

<table>
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<th>OLS</th>
<th>Poisson</th>
<th>OLS</th>
</tr>
</thead>
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<td>OilExposed * OilPrice</td>
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<td>-0.365*</td>
<td>-0.187</td>
<td>-0.024</td>
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<td>(0.109)</td>
<td>(0.207)</td>
<td>(0.422)</td>
<td>(0.627)</td>
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<td>Debt/Assets * OilExposed</td>
<td>-5.937</td>
<td>-7.346</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>(6.606)</td>
<td>(9.806)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Debt/Assets * OilPrice</td>
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<td>-1.951</td>
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</tr>
<tr>
<td></td>
<td>(1.286)</td>
<td>(2.435)</td>
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<td></td>
</tr>
<tr>
<td>Debt/Assets * OilExposed * OilPrice</td>
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<td>-1.176</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1.636)</td>
<td>(2.563)</td>
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<td></td>
</tr>
<tr>
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<td>10.380**</td>
<td>9.376</td>
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<td>(0.525)</td>
<td>(0.794)</td>
<td>(5.234)</td>
<td>(9.091)</td>
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<td>(0.486)</td>
<td>(0.870)</td>
<td>(0.543)</td>
<td>(0.887)</td>
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<td>CashFlow/Assets</td>
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<td>-0.202</td>
<td>-0.873</td>
<td>-0.315</td>
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<tr>
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<td>(0.609)</td>
<td>(0.826)</td>
<td>(0.755)</td>
<td>(0.903)</td>
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<tr>
<td>Dividends/Assets</td>
<td>-3.418</td>
<td>3.857</td>
<td>5.768</td>
<td>3.272</td>
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<tr>
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<td>(4.119)</td>
<td>(5.293)</td>
<td>(4.815)</td>
<td>(6.052)</td>
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<td>Log(Assets)</td>
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<td>0.507</td>
<td>0.298</td>
<td>0.537</td>
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<td>(0.237)</td>
<td>(0.341)</td>
<td>(0.238)</td>
<td>(0.351)</td>
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<td>AssetTurnover</td>
<td>0.762***</td>
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<td>0.725***</td>
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<td>(0.376)</td>
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<td>-0.039</td>
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<td>(0.175)</td>
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<td>(1.559)</td>
<td>(1.219)</td>
<td>(1.524)</td>
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<td>(0.765)</td>
<td>(0.902)</td>
<td>(0.759)</td>
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<td>Log(Employees )</td>
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<td>-0.925</td>
<td>-0.661***</td>
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<td>(0.163)</td>
<td>(0.176)</td>
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<td>Hours/Employee</td>
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<td>-0.000***</td>
<td>-0.000***</td>
<td>-0.000***</td>
</tr>
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<td></td>
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</table>
Table C.4: Workplace injuries and oil price shocks - using only BLS data to identify firms with oil establishments

This table presents estimates of the effect of oil price shocks on injury rates. Odd-numbered columns show results from establishment fixed effects Poisson regressions, where the dependent variable is the number of injuries reported at an establishment in a given year, and the number of hours worked at the establishment during the year is specified as an exposure variable. Even-numbered columns show results from establishment fixed effects OLS regressions, where the dependent variable is $\log[(\text{Injuries} + 1)/\text{HoursWorked}]$. All regressions include industry-year and state-year dummies. Regressions shown in columns (1), (2), (5), and (6) use all establishments appearing in the sample at least twice. Regressions in columns (3), (4), (7), and (8) use a propensity score-matched sample. Both samples consist only of non-oil producing establishments. $\text{OilExposed}$ is an indicator variable taking a value of one if an establishment’s parent firm has an oil-producing establishment in the BLS data in any year in the sample. $\text{OilPrice}$ is the natural log of the price of oil. $\text{Debt/Assets}$, $\text{Cash/Assets}$, $\text{Log(Assets)}$, $\text{MarketToBook}$, and $\text{TangibleAssetRatio}$ are lagged one year, while $\text{CashFlow/Assets}$, $\text{Dividends/Assets}$, $\text{AssetTurnover}$, $\text{Capex/Assets}$, $\text{Log(employees)}$, and $\text{Hours/Employee}$ are measured contemporaneously. See Table 2 for definitions of these variables. Standard errors clustered at the firm level are reported in parentheses below each point estimate. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively, based on a two-tailed z-test.

<table>
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<th>Sample</th>
<th>Non-matched Poisson</th>
<th>Propensity-matched Poisson</th>
<th>Non-matched OLS</th>
<th>Propensity-matched OLS</th>
</tr>
</thead>
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<tr>
<td>OilExposed * OilPrice</td>
<td>-0.361*** (0.100)</td>
<td>-0.790*** (0.137)</td>
<td>-0.029 (0.179)</td>
<td>-0.620*** (0.189)</td>
</tr>
<tr>
<td>Debt/Assets * OilExposed</td>
<td>4.528 (3.281)</td>
<td>1.326 (3.469)</td>
<td>-13.994*** (4.826)</td>
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</tr>
<tr>
<td>Debt/Assets * OilPrice</td>
<td>0.274* (0.142)</td>
<td>-0.158** (0.069)</td>
<td>-2.366** (0.432)</td>
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<tr>
<td>Debt/Assets * OilPrice</td>
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<td>0.678** (0.538)</td>
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<tr>
<td>Cash/Assets</td>
<td>0.073 (0.058)</td>
<td>0.161 (0.835)</td>
<td>-0.338 (0.606)</td>
<td>0.104** (0.135)</td>
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<tr>
<td>CashFlow/Assets</td>
<td>-0.222 (0.058)</td>
<td>-1.119 (0.835)</td>
<td>-0.484 (0.606)</td>
<td>-0.054 (0.135)</td>
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<tr>
<td>Dividends/Assets</td>
<td>0.214 (0.048)</td>
<td>5.150** (0.355)</td>
<td>0.161 (0.490)</td>
<td>0.306 (0.056)</td>
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<tr>
<td>Log(Assets)</td>
<td>0.038 (0.012)</td>
<td>-0.338 (0.102)</td>
<td>0.292* (0.842)</td>
<td>0.632*** (0.794)</td>
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<tr>
<td>AssetTurnover</td>
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<td>0.104** (0.172)</td>
<td>0.052** (0.172)</td>
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<td>MarketToBook</td>
<td>0.273 (0.058)</td>
<td>1.875 (0.355)</td>
<td>5.150** (0.490)</td>
<td>0.161 (0.056)</td>
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<tr>
<td>TangibleAssetRatio</td>
<td>0.119 (0.023)</td>
<td>-0.338 (0.102)</td>
<td>0.292* (0.842)</td>
<td>0.632*** (0.794)</td>
</tr>
<tr>
<td>Capex/Assets</td>
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<td>5.150** (0.355)</td>
<td>0.161 (0.490)</td>
<td>0.306 (0.056)</td>
</tr>
<tr>
<td>Log(employees)</td>
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<td>-0.338 (0.842)</td>
<td>-0.094 (0.794)</td>
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<td>Hours/Employee</td>
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<td>-0.000*** (0.000)</td>
<td>-0.000*** (0.000)</td>
<td>-0.000*** (0.000)</td>
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<td>0.4270</td>
<td>0.1124</td>
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</table>
Table C.5: Workplace injuries and oil price shocks - excluding financial crisis period

This table presents estimates of the effect of oil price shocks on injury rates, with the sample restricted to 2002-2007. Odd-numbered columns show results from establishment fixed effects Poisson regressions, where the dependent variable is the number of injuries reported at an establishment in a given year, and the number of hours worked at the establishment during the year is specified as an exposure variable. Even-numbered columns show results from establishment fixed effects OLS regressions, where the dependent variable is $\log(\frac{\text{Injuries} + 1}{\text{HoursWorked}})$. All regressions include industry-year and state-year dummies. Regressions shown in columns (1), (2), (5), and (6) use all establishments appearing in the sample at least twice. Regressions in columns (3), (4), (7), and (8) use a propensity score-matched sample. Both samples consist only of non-oil producing establishments. $\text{OilExposed}$ is an indicator variable taking a value of one if an establishment’s parent firm is in the oil business (either has an oil-producing establishment in the BLS data in any year in the sample or is identified by Capital IQ as being in the oil, gas, and consumable fuels business, excluding coal mining). $\text{OilPrice}$ is the natural log of the price of oil. $\text{Debt/Assets}$, $\text{Cash/Assets}$, $\text{Log(Assets)}$, $\text{MarketToBook}$, and $\text{TangibleAssetRatio}$ are lagged one year, while $\text{CashFlow/Assets}$, $\text{Dividends/Assets}$, $\text{AssetTurnover}$, $\text{Capex/Assets}$, $\text{Log(Employees)}$, and $\text{Hours/Employee}$ are measured contemporaneously. See Table 2 for definitions of these variables. Standard errors clustered at the firm level are reported in parentheses below each point estimate. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively, based on a two-tailed z-test.

<table>
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<tr>
<th>Sample</th>
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<th>OLS</th>
<th>Non-matched Poisson</th>
<th>OLS</th>
<th>Propensity-matched Poisson</th>
<th>OLS</th>
</tr>
</thead>
<tbody>
<tr>
<td>OilExposed * OilPrice</td>
<td>-0.312*** (0.116)</td>
<td>-0.219** (0.106)</td>
<td>-0.381*** (0.101)</td>
<td>-0.250 (0.154)</td>
<td>0.227</td>
<td>-0.353</td>
<td>(0.243)</td>
<td>-0.228</td>
</tr>
<tr>
<td>Debt/Assets * OilExposed</td>
<td>9.018** (4.515)</td>
<td>-2.854 (4.306)</td>
<td>-1.250** (3.111)</td>
<td>-0.630 (4.115)</td>
<td>0.361** (0.179)</td>
<td>-0.154 (0.088)</td>
<td>-1.072 (0.537)</td>
<td>-0.573 (0.494)</td>
</tr>
<tr>
<td>Debt/Assets * OilPrice</td>
<td>-3.049*** (1.166)</td>
<td>0.517 (1.095)</td>
<td>-2.315*** (0.795)</td>
<td>-1.015 (1.073)</td>
<td>0.285*** (0.095)</td>
<td>0.102 (0.074)</td>
<td>0.555** (0.292)</td>
<td>0.231 (0.321)</td>
</tr>
<tr>
<td>Debt/Assets * OilExposed</td>
<td>0.285*** (0.344)</td>
<td>0.089*** (0.206)</td>
<td>-0.036 (0.181)</td>
<td>0.167 (0.948)</td>
<td>0.167 (0.053)</td>
<td>0.108** (0.051)</td>
<td>0.162 (0.173)</td>
<td>0.054 (0.050)</td>
</tr>
<tr>
<td>Debt/Assets</td>
<td>0.183 (0.344)</td>
<td>0.313 (0.206)</td>
<td>-1.286 (1.871)</td>
<td>0.255 (0.948)</td>
<td>0.055 (0.053)</td>
<td>0.051 (0.162)</td>
<td>0.173 (0.050)</td>
<td>0.051 (0.051)</td>
</tr>
<tr>
<td>Cash/Assets</td>
<td>0.037 (0.052)</td>
<td>0.089*** (0.030)</td>
<td>0.103 (0.143)</td>
<td>0.089*** (0.122)</td>
<td>0.056 (0.014)</td>
<td>0.009 (0.009)</td>
<td>0.016 (0.058)</td>
<td>0.015 (0.055)</td>
</tr>
<tr>
<td>AssetTurnover</td>
<td>-0.006 (0.038)</td>
<td>-0.036 (0.024)</td>
<td>0.009 (0.140)</td>
<td>-0.016 (0.175)</td>
<td>-0.023 (0.034)</td>
<td>-0.036 (0.024)</td>
<td>-0.029 (0.024)</td>
<td>-0.035 (0.149)</td>
</tr>
<tr>
<td>MarketToBook</td>
<td>-0.033** (0.014)</td>
<td>-0.010 (0.009)</td>
<td>-0.091 (0.058)</td>
<td>-0.073 (0.055)</td>
<td>-0.035*** (0.014)</td>
<td>-0.010 (0.009)</td>
<td>-0.009 (0.014)</td>
<td>-0.009 (0.058)</td>
</tr>
<tr>
<td>TangibleAssetRatio</td>
<td>-0.151 (0.225)</td>
<td>0.028 (0.128)</td>
<td>-0.175 (0.547)</td>
<td>0.606 (0.611)</td>
<td>-0.138 (0.219)</td>
<td>0.028 (0.128)</td>
<td>0.016 (0.129)</td>
<td>-0.026 (0.563)</td>
</tr>
<tr>
<td>Capex/Assets</td>
<td>-0.285 (0.289)</td>
<td>-0.250 (0.191)</td>
<td>-0.875 (0.533)</td>
<td>-0.672 (0.468)</td>
<td>-0.287 (0.291)</td>
<td>-0.250 (0.191)</td>
<td>-0.576 (0.291)</td>
<td>-0.563 (0.499)</td>
</tr>
<tr>
<td>Log(Employees)</td>
<td>-0.177*** (0.042)</td>
<td>-0.391*** (0.025)</td>
<td>-0.043 (0.092)</td>
<td>-0.432*** (0.096)</td>
<td>-0.176*** (0.042)</td>
<td>-0.391*** (0.025)</td>
<td>-0.000*** (0.025)</td>
<td>-0.000*** (0.093)</td>
</tr>
<tr>
<td>Hours/Employee</td>
<td>-0.000*** (0.000)</td>
<td>-0.000*** (0.000)</td>
<td>-0.000*** (0.000)</td>
<td>-0.000*** (0.000)</td>
<td>-0.000*** (0.000)</td>
<td>-0.000*** (0.000)</td>
<td>-0.000*** (0.000)</td>
<td>-0.000*** (0.000)</td>
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<td>Log Likelihood</td>
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<td>-34,594</td>
<td>-17,010</td>
<td>-17,010</td>
<td>-658</td>
<td>-658</td>
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<td>-658</td>
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<tr>
<td>Adjusted R2</td>
<td>0.1276</td>
<td>0.3174</td>
<td>0.1281</td>
<td>0.3186</td>
<td>0.1276</td>
<td>0.3186</td>
<td>0.1276</td>
<td>0.3186</td>
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</tbody>
</table>

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Table C.6: Workplace injuries and the American Jobs Creation Act - DAFW injuries

This table presents estimates of the effect of the American Jobs Creation Act of 2004 on days away from work (DAFW) injury rates. Odd-numbered columns show results from establishment fixed effects Poisson regressions, where the dependent variable is the number of DAFW injuries reported at an establishment in a given year, and the number of hours worked at the establishment during the year is specified as an exposure variable. Even-numbered columns show results from establishment fixed effects OLS regressions, where the dependent variable is \( \log \left( \frac{DAFW\text{Injuries} + 1}{Hours\text{Worked}} \right) \). All regressions include industry-year and state-year dummies. Only observations in 2002, 2003, 2005 and 2006 are used in the regressions. Regressions shown in columns (1), (2), (5), and (6) use all establishments appearing in the sample at least once before and after 2004 during this period. Regressions in columns (3), (4), (7), and (8) use a propensity score-matched sample. Post2004 is an indicator variable taking a value of one in years 2005 and 2006 and zero in years 2002 and 2003. PosFP is an indicator taking a value of one if the parent firm’s cumulative reported foreign profits in 2001-2003 were positive, and zero otherwise. Debt/Assets, Cash/Assets, Log(Assets), MarketToBook, and TangibleAssetRatio are lagged one year, while CashFlow/Assets, Dividends/Assets, AssetTurnover, Capex/Assets, Log(Employees), and Hours/Employee are measured contemporaneously. See Table 2 for definitions of these variables. Standard errors clustered at the firm level are reported in parentheses below each point estimate. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively, based on a two-tailed z-test.

<table>
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<tr>
<th>Sample</th>
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<th>Full sample OLS</th>
<th>Propensity-matched Poisson</th>
<th>Propensity-matched OLS</th>
</tr>
</thead>
<tbody>
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<td>Post2004 * PosFP</td>
<td>-0.091***</td>
<td>-0.021</td>
<td>-0.116***</td>
<td>0.149</td>
</tr>
<tr>
<td></td>
<td>(0.041)</td>
<td>(0.028)</td>
<td>(0.053)</td>
<td>(0.052)</td>
</tr>
<tr>
<td>Debt/Assets * Post2004</td>
<td>0.305</td>
<td>0.024</td>
<td>-0.300</td>
<td>0.062</td>
</tr>
<tr>
<td></td>
<td>(0.475)</td>
<td>(0.085)</td>
<td>(0.185)</td>
<td>(0.220)</td>
</tr>
<tr>
<td>Debt/Assets * PosFP</td>
<td>0.252</td>
<td>-0.364</td>
<td>2.318***</td>
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</tr>
<tr>
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<td>(0.436)</td>
<td>(0.239)</td>
<td>(0.562)</td>
<td>(0.557)</td>
</tr>
<tr>
<td>Debt/Assets * Post2004</td>
<td>-0.777*</td>
<td>-0.236</td>
<td>-0.190</td>
<td>-0.502*</td>
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<td>(0.451)</td>
<td>(0.173)</td>
<td>(0.323)</td>
<td>(0.295)</td>
</tr>
<tr>
<td>Debt/Assets</td>
<td>0.333**</td>
<td>0.231**</td>
<td>-0.956***</td>
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<tr>
<td></td>
<td>(0.140)</td>
<td>(0.103)</td>
<td>(0.227)</td>
<td>(0.273)</td>
</tr>
<tr>
<td>Cash/Assets</td>
<td>-0.330</td>
<td>-0.037</td>
<td>-0.542</td>
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<tr>
<td></td>
<td>(0.338)</td>
<td>(0.099)</td>
<td>(0.374)</td>
<td>(0.287)</td>
</tr>
<tr>
<td>CashFlow/Assets</td>
<td>-0.073</td>
<td>0.070</td>
<td>-0.013</td>
<td>0.027</td>
</tr>
<tr>
<td></td>
<td>(0.066)</td>
<td>(0.065)</td>
<td>(0.091)</td>
<td>(0.204)</td>
</tr>
<tr>
<td>Dividends/Assets</td>
<td>0.238</td>
<td>0.127</td>
<td>7.532***</td>
<td>0.617</td>
</tr>
<tr>
<td></td>
<td>(1.759)</td>
<td>(0.644)</td>
<td>(2.523)</td>
<td>(2.397)</td>
</tr>
<tr>
<td>Log(Assets)</td>
<td>0.071</td>
<td>0.061</td>
<td>-0.030</td>
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<tr>
<td></td>
<td>(0.082)</td>
<td>(0.043)</td>
<td>(0.118)</td>
<td>(0.099)</td>
</tr>
<tr>
<td>AssetTurnover</td>
<td>0.153</td>
<td>-0.059</td>
<td>0.202**</td>
<td>0.143</td>
</tr>
<tr>
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<td>(0.157)</td>
<td>(0.036)</td>
<td>(0.097)</td>
<td>(0.105)</td>
</tr>
<tr>
<td>MarketToBook</td>
<td>-0.054</td>
<td>0.001</td>
<td>0.047</td>
<td>0.056</td>
</tr>
<tr>
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<td>(0.045)</td>
<td>(0.009)</td>
<td>(0.049)</td>
<td>(0.044)</td>
</tr>
<tr>
<td>TangibleAssetRatio</td>
<td>-0.489</td>
<td>0.082</td>
<td>0.508</td>
<td>0.498</td>
</tr>
<tr>
<td></td>
<td>(0.560)</td>
<td>(0.161)</td>
<td>(0.451)</td>
<td>(0.337)</td>
</tr>
<tr>
<td>Capex/Assets</td>
<td>-0.463</td>
<td>-0.113</td>
<td>0.254</td>
<td>-0.547</td>
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<tr>
<td></td>
<td>(0.609)</td>
<td>(0.239)</td>
<td>(0.773)</td>
<td>(0.651)</td>
</tr>
<tr>
<td>Log(Employees)</td>
<td>-0.276***</td>
<td>-0.575***</td>
<td>-0.241***</td>
<td>-0.475***</td>
</tr>
<tr>
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<td>(0.075)</td>
<td>(0.028)</td>
<td>(0.101)</td>
<td>(0.067)</td>
</tr>
<tr>
<td>Hours/Employee</td>
<td>-0.001***</td>
<td>-0.001***</td>
<td>-0.001***</td>
<td>-0.000***</td>
</tr>
<tr>
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<td>(0.000)</td>
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<td>(0.000)</td>
<td>(0.000)</td>
</tr>
<tr>
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<td>7,504</td>
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<td>3,324</td>
</tr>
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<td>Log Likelihood</td>
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<td>-17,989</td>
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<td>Adjusted R2</td>
<td>0.1150</td>
<td>0.1033</td>
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</table>
Table C.7: Workplace injuries and debt maturity during the financial crisis - DAFW injuries

This table presents estimates of the effect of having a large quantity of debt maturing at the onset of the financial crisis on days away from work (DAFW) injury rates. Odd-numbered columns show results from establishment fixed effects Poisson regressions, where the dependent variable is the number of DAFW injuries reported at an establishment in a given year, and the number of hours worked at the establishment during the year is specified as an exposure variable. Even-numbered columns show results from establishment fixed effects OLS regressions, where the dependent variable is $\log[(\text{DAFW Injuries} + 1)/\text{Hours Worked}]$. All regressions include industry-year and state-year dummies. The sample period is 2006-2008. Regressions shown in columns (1) and (2) use all establishments appearing in the sample at least once in 2006-2007 and also appearing in 2008. Regressions in columns (3) and (4) use a propensity score-matched sample. 

Crisis is defined as an indicator variable taking a value of one in 2008 and zero in preceding years. HighDebtDue is an indicator variable taking a value of one if a firm’s debt maturing within one year as of fiscal year end 2007 as a percentage of assets exceeds the 75th percentile for the sample (3.064%) and zero otherwise. Only firms whose 2007 fiscal year end fell between August 2007 and January 2008 are included in the sample. Debt/Assets, Cash/Assets, Log(Assets), MarketToBook, and TangibleAssetRatio are lagged one year, while CashFlow/Assets, Dividends/Assets, AssetTurnover, Capex/Assets, Log(Employees), and Hours/Employee are measured contemporaneously. See Table 2 for definitions of these variables. Standard errors clustered at the firm level are reported in parentheses below each point estimate. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively, based on a two-tailed z-test.

<table>
<thead>
<tr>
<th>Sample</th>
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<th>OLS</th>
<th>Poisson</th>
<th>OLS</th>
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</thead>
<tbody>
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<td>0.009</td>
<td>0.006</td>
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</tr>
<tr>
<td></td>
<td>(0.039)</td>
<td>(0.032)</td>
<td>(0.047)</td>
<td>(0.071)</td>
</tr>
<tr>
<td>Debt/Assets</td>
<td>-0.104</td>
<td>-0.081</td>
<td>0.159</td>
<td>0.207</td>
</tr>
<tr>
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<td>(0.158)</td>
<td>(0.124)</td>
<td>(0.382)</td>
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</tr>
<tr>
<td>Cash/Assets</td>
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</tr>
<tr>
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<td>(0.268)</td>
<td>(0.084)</td>
<td>(0.590)</td>
<td>(0.563)</td>
</tr>
<tr>
<td>CashFlow/Assets</td>
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<td>-0.025</td>
<td>0.254</td>
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</tr>
<tr>
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<td>(0.107)</td>
<td>(0.093)</td>
<td>(0.306)</td>
<td>(0.303)</td>
</tr>
<tr>
<td>Dividends/Assets</td>
<td>-1.615</td>
<td>-1.184*</td>
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</tr>
<tr>
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<td>(1.580)</td>
<td>(0.673)</td>
<td>(1.671)</td>
<td>(2.816)</td>
</tr>
<tr>
<td>Log(Assets)</td>
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<td>-0.022</td>
<td>-0.163</td>
<td>-0.152</td>
</tr>
<tr>
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<td>(0.083)</td>
<td>(0.051)</td>
<td>(0.190)</td>
<td>(0.171)</td>
</tr>
<tr>
<td>AssetTurnover</td>
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<td>0.070*</td>
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</tr>
<tr>
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<td>(0.066)</td>
<td>(0.038)</td>
<td>(0.163)</td>
<td>(0.133)</td>
</tr>
<tr>
<td>MarketToBook</td>
<td>-0.028</td>
<td>-0.020</td>
<td>0.249***</td>
<td>0.098*</td>
</tr>
<tr>
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<td>(0.028)</td>
<td>(0.014)</td>
<td>(0.078)</td>
<td>(0.060)</td>
</tr>
<tr>
<td>TangibleAssetRatio</td>
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<td>0.560**</td>
<td>-0.536</td>
<td>-0.373</td>
</tr>
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<td>(0.255)</td>
<td>(0.237)</td>
<td>(0.549)</td>
<td>(0.652)</td>
</tr>
<tr>
<td>Capex/Assets</td>
<td>-0.998**</td>
<td>-0.568***</td>
<td>-2.171**</td>
<td>-1.207**</td>
</tr>
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<td>(0.274)</td>
<td>(0.975)</td>
<td>(0.692)</td>
</tr>
<tr>
<td>Log(Employees)</td>
<td>-0.130</td>
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<td>-0.228**</td>
<td>-0.346***</td>
</tr>
<tr>
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<td>(0.123)</td>
<td>(0.046)</td>
<td>(0.108)</td>
<td>(0.092)</td>
</tr>
<tr>
<td>Hours/Employee</td>
<td>-0.000**</td>
<td>-0.000***</td>
<td>0.000</td>
<td>-0.000***</td>
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<td></td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
</tr>
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<td>Log Likelihood</td>
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<tr>
<td>Adjusted R2</td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table C.8: Workplace injuries and oil price shocks - DAFW injuries

This table presents estimates of the effect of oil price shocks on days away from work (DAFW) injury rates. Odd-numbered columns show results from establishment fixed effects Poisson regressions, where the dependent variable is the number of DAFW injuries reported at an establishment in a given year, and the number of hours worked at the establishment during the year is specified as an exposure variable. Even-numbered columns show results from establishment fixed effects OLS regressions, where the dependent variable is \( \log(\frac{(DAFWInjuries + 1)}{HoursWorked}) \). All regressions include industry-year and state-year dummies. Regressions shown in columns (1), (2), (5), and (6) use all establishments appearing in the sample at least twice. Regressions in columns (3), (4), (7), and (8) use a propensity score-matched sample. Both samples consist only of non-oil producing establishments. \( OilExposed \) is an indicator variable taking a value of one if an establishment’s parent firm is in the oil business (either has an oil-producing establishment in any year in the sample or is identified by Capital IQ as being in the oil, gas, and consumable fuels business, excluding coal mining. \( OilPrice \) is the natural log of the price of oil. \( Debt/Assets, Cash/Assets, Log(Assets), MarketToBook, \) and \( TangibleAssetRatio \) are lagged one year, while \( CashFlow/Assets, Dividends/Assets, AssetTurnover, Capex/Assets, Log(Employees), \) and \( Hours/Employee \) are measured contemporaneously. See Table 2 for definitions of these variables. Standard errors clustered at the firm level are reported in parentheses below each point estimate. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively, based on a two-tailed z-test.

<table>
<thead>
<tr>
<th>Sample</th>
<th>Full sample</th>
<th>Propensity-matched</th>
<th>Full sample</th>
<th>Propensity-matched</th>
</tr>
</thead>
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<td>OLS</td>
<td>Poisson</td>
<td>OLS</td>
</tr>
<tr>
<td>OilExposed * OilPrice</td>
<td>-0.501***</td>
<td>-0.105</td>
<td>-0.506***</td>
<td>0.012</td>
</tr>
<tr>
<td></td>
<td>(0.163)</td>
<td>(0.087)</td>
<td>(0.124)</td>
<td>(0.187)</td>
</tr>
<tr>
<td>Debt/Assets * OilExposed</td>
<td>4.427</td>
<td>-0.042</td>
<td>3.479</td>
<td>-3.783</td>
</tr>
<tr>
<td></td>
<td>(8.936)</td>
<td>(2.982)</td>
<td>(9.918)</td>
<td>(5.306)</td>
</tr>
<tr>
<td>Debt/Assets * OilPrice</td>
<td>0.147</td>
<td>-0.123***</td>
<td>-0.826</td>
<td>-2.000**</td>
</tr>
<tr>
<td></td>
<td>(0.451)</td>
<td>(0.067)</td>
<td>(0.679)</td>
<td>(0.827)</td>
</tr>
<tr>
<td>Debt/Assets * OilExposed</td>
<td>-1.773</td>
<td>-0.095</td>
<td>-1.285</td>
<td>1.190</td>
</tr>
<tr>
<td></td>
<td>(2.396)</td>
<td>(0.751)</td>
<td>(2.588)</td>
<td>(1.356)</td>
</tr>
<tr>
<td>Debt/Assets</td>
<td>0.202</td>
<td>0.066</td>
<td>-0.302</td>
<td>-0.155</td>
</tr>
<tr>
<td></td>
<td>(0.160)</td>
<td>(0.055)</td>
<td>(0.395)</td>
<td>(0.502)</td>
</tr>
<tr>
<td>Cash/Assets</td>
<td>-0.157</td>
<td>0.019</td>
<td>1.176**</td>
<td>0.787*</td>
</tr>
<tr>
<td></td>
<td>(0.316)</td>
<td>(0.050)</td>
<td>(0.571)</td>
<td>(0.425)</td>
</tr>
<tr>
<td>CashFlow/Assets</td>
<td>-0.022</td>
<td>0.037</td>
<td>-0.159</td>
<td>-0.104</td>
</tr>
<tr>
<td></td>
<td>(0.067)</td>
<td>(0.046)</td>
<td>(0.128)</td>
<td>(0.273)</td>
</tr>
<tr>
<td>Dividends/Assets</td>
<td>0.327</td>
<td>0.164</td>
<td>4.644***</td>
<td>4.485***</td>
</tr>
<tr>
<td></td>
<td>(0.298)</td>
<td>(0.189)</td>
<td>(1.120)</td>
<td>(1.513)</td>
</tr>
<tr>
<td>Log(Assets)</td>
<td>0.100</td>
<td>0.045*</td>
<td>0.519***</td>
<td>0.065</td>
</tr>
<tr>
<td></td>
<td>(0.077)</td>
<td>(0.023)</td>
<td>(0.148)</td>
<td>(0.207)</td>
</tr>
<tr>
<td>AssetTurnover</td>
<td>0.214***</td>
<td>0.020</td>
<td>1.044***</td>
<td>0.836***</td>
</tr>
<tr>
<td></td>
<td>(0.069)</td>
<td>(0.019)</td>
<td>(0.227)</td>
<td>(0.265)</td>
</tr>
<tr>
<td>MarketToBook</td>
<td>-0.069***</td>
<td>-0.022***</td>
<td>-0.202**</td>
<td>-0.239**</td>
</tr>
<tr>
<td></td>
<td>(0.016)</td>
<td>(0.007)</td>
<td>(0.098)</td>
<td>(0.107)</td>
</tr>
<tr>
<td>TangibleAssetRatio</td>
<td>0.010</td>
<td>0.478***</td>
<td>-0.333</td>
<td>-0.875</td>
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<tr>
<td></td>
<td>(0.268)</td>
<td>(0.101)</td>
<td>(0.525)</td>
<td>(0.699)</td>
</tr>
<tr>
<td>Capex/Assets</td>
<td>-1.048***</td>
<td>-0.217</td>
<td>-0.984</td>
<td>-0.686</td>
</tr>
<tr>
<td></td>
<td>(0.454)</td>
<td>(0.143)</td>
<td>(0.851)</td>
<td>(0.747)</td>
</tr>
<tr>
<td>Log(Employees)</td>
<td>-0.190**</td>
<td>-0.576***</td>
<td>0.196</td>
<td>-0.580***</td>
</tr>
<tr>
<td></td>
<td>(0.081)</td>
<td>(0.018)</td>
<td>(0.180)</td>
<td>(0.095)</td>
</tr>
<tr>
<td>Hours/Employee</td>
<td>-0.001***</td>
<td>-0.001***</td>
<td>0.000**</td>
<td>-0.000</td>
</tr>
<tr>
<td></td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
</tr>
<tr>
<td>Observations</td>
<td>21,515</td>
<td>21,515</td>
<td>933</td>
<td>933</td>
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<tr>
<td>Log Likelihood</td>
<td>-30,853</td>
<td>0.1657</td>
<td>0.2243</td>
<td>0.1659</td>
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<tr>
<td>Adjusted R2</td>
<td>-30,853</td>
<td>0.1657</td>
<td>0.2243</td>
<td>0.1659</td>
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