The "Monday Effect" in Workers' Compensation: Evidence from the California Reforms

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Abstract

The large excess fraction of difficult-to-diagnose injuries on Monday was originally thought to reflect employees' use of workers' compensation to cover weekend injuries. However, there has been mixed evidence found supporting this notion. This paper takes advantage of substantial reforms in California which both made filing false claims more difficult and less attractive via reduced benefits. The effects of the reforms on the frequency of Monday claims and hard-to-diagnose injuries are empirically tested using 2002-2006 workers' compensation claims from a large temporary employment agency, an industry with pronounced asymmetric information. In the post-reform period, the fraction of claims on Monday for difficult-to-diagnose injuries drops by 7 percentage points in California – with no change for branches in other states. The results are consistent with false claims explaining a part of the Monday effect, in industries with large asymmetric information. That said, when taking into account the effects of the reforms on claim costs and overall claim rates, the excess number of Monday claims make up less than 4 percent of the cost reductions brought on by the reforms.

Keywords: Workers' Compensation, Moral Hazard, Monday Effect, Temporary Employment

JEL Classification: I18, J28, J53

*I wish to thank Peter Kuhn, Doug Steigerwald, Olivier Deschênes, Kelly Bedard, Phillip Babcock, Jon Sonstelie and participants at the UCSB labor lunch for helpful comments and advice. I am extremely grateful to all of those who helped in obtaining the data.

1 Introduction

Historically, Monday has been a disproportionately dangerous day to work. Smith (1989) found that the excess fraction of injuries on Monday is largest for injuries that are difficult to diagnose, suggesting that workers might be filing easily-concealed weekend accidents as workers' compensation injuries. If employees are indeed using workers' compensation for weekend injuries, this adverse selection would only add additional externalities to an already costly social insurance program (currently with over $53 billion dollars in annual benefits[1]). While the excess fraction of injuries on Monday is well-documented, if weekend injuries are driving the excess fraction of Monday claims then Monday claiming activity should be sensitive to both the relative benefits of filing false claims. However, previous studies have disagreed on whether benefits affect the likelihood of Monday injuries (see Card and McCall (1996), Ruser (1998) and Campoliete and Hyatt (2006)). With that in mind, there remains uncertainty regarding the role weekend injuries play in explaining the prevalence of Monday injuries.

This paper offers the first quasi-experimental evidence to test whether the excess fraction of injuries arising on Monday can be attributed to weekend injuries, examining whether recent reforms in California affected the high incidence of Monday claims. The passage of reforms in California in 2004 allowed employers to choose the doctors rather than the employees, required workers to show what fraction of the injury occurred on the job, and limited the duration under which employees could receive temporary total benefits – among many other changes. These recent changes provide a test for the weekend injury hypothesis

[1]Source: National Academy of Social Insurance.

as the reforms both potentially decrease the expectation of successfully filing false claims and also reduce benefits even if false claims are filed successfully.

Using administrative records and detailed micro data from a large national staffing firm in the United States (employing over 70,000 temporaries on a yearly basis), I investigate injuries and claims in over 35 states (although a plurality are employed in California).[2] Because temporary employment is an industry in which higher levels of asymmetric information can increase moral hazard, the claims data in this analysis provide an ideal setting to link off-the-job injuries to the relative prevalence of Monday injuries.[3] By the nature of the employment situation, it is difficult for the temporary firm to monitor the safety of its workers and also the temporary workers bear little attachment to the firm. In short, if there is no evidence that the excess number of Monday injuries is due to off-the-job injuries in industries like temporary employment, it would be unlikely to be uncovered elsewhere.

Before the reforms, Monday injuries composed 24 % of difficult-to-diagnose injuries and only 19 % of easier-to-diagnose causes. After the reforms, only 17 % of difficult-to-diagnose injuries occurred on Monday in California, with essentially no change for easy-to-diagnose causes. The findings are consistent with the hypothesis that fraudulent claims compose a fraction of the Monday effect, at least in employment settings with substantial asymmetric information between employers and employees – such as temporary employment.

[2]There are employees in 41 states, although the hours worked in 6 states is small enough that no injuries are recorded during the 2002-2006 period.

[3]While the growth of temporary employment (see Figure 1 in the Appendix) has attracted the focus of much recent research by economists concerning its effects on earnings and employment, there are many reasons why temporary employment making it a fruitful setting to test for evidence of moral hazard in claiming behavior. Because temporary firms are not present at the job site the asymmetric information between employers and employees can be amplified, which has been evidenced by higher claim rates in temporary employment (Park and Butler 2001). In addition, contingent workers have less job security, an element Fortin and Lanoie (1992) documents can increase claims. Outside of economics, a growing literature addresses these and other concerns regarding the safety of contingent employees (see Virtanen et al. (2005) for an overview).

The remainder of the paper proceeds as follows. Section 2 provides a background of the literature on workers' compensation, the Monday effect and also explanations for why the reforms in California would impact claiming behavior. Section 3 provides initial analysis by demonstrating that prior to the reforms the excess fraction of injuries on Monday was as high as 8.6 percentage points and also showing that even in simple summary statistics the laws appear to have reduced the relative frequency of Monday injuries. Section 4 contains a more detailed examination of the effects of the reforms mandated by SB 899 on Monday claims. Section 5 summarizes the effect of the reforms on overall claim rates, claim costs (compensation, medical, and legal), thus providing a scale of how important the reduction in Monday claims may be relative to other worker behaviors affected by the reforms. Section 6 concludes discussing implications of the results.

2 Background

2.1 Moral Hazard in Workers' Compensation

As with other forms of social insurance, moral hazard plays a large role in the interaction of potential beneficiaries (employees and employers alike). Regarding workers' compensation, the asymmetric information can largely be decomposed into two forms. First, employers are not able to fully observe the effort that workers exert to avoid injuries – referred to as ex-ante moral hazard. The second, called ex-post moral hazard, concerns the nature and extent of injury which is known by the employee but not to the employer. These two types of informational asymmetries thereby allow workers put forth less safety effort than the firm would desire, exaggerate the injury's severity or misrepresent the cause – conceivably to increase their consumption of leisure.

Along this line, a large literature has found that increased workers' compensation benefits – in the form of either greater replacement rates (the fraction of wages that is replaced with workers' compensation benefits) [4] or shorting waiting periods (the time which must elapse before workers begin to receive compensation benefits) – are associated with increased claims. For instance, Butler and Worrall (1983) and Krueger (1990) find higher benefits increase the number of claims filed, while Meyer et al. (1995) and Butler and Worrall (1985) associate higher benefits with longer claim duration. More recently, Neuhauser and Raphel (2004) study large increases in benefits in California in the mid 1990's, finding higher benefit levels both increase claim frequency and also disability duration, while the additional claims filed appear to be less severe.

Logically, if moral hazard is present then one would expect relative claim rates to be higher amongst injuries or situations which exhibit greater asymmetries of information. With this theoretical prediction in mind, Bolduc et al. (2002) focus on construction workers in Ottawa, and confirm that higher benefits disproportionately increase the likelihood of filing difficult-to-diagnose injuries. Biddle and Roberts (2003) find similar evidence relating benefit generosity and claims using administrative records from Michigan, with severity of injury and overall health also playing large roles. These findings are seen as potential evidence of workers taking advantage of asymmetric information regarding the true extent of injury and recovery.

[4] It is typically 2/3 of gross earnings subject to minimum and maximum thresholds, with benefits received free of taxes. As such both the tax liability of workers and the thresholds create replacement rates often close 80 or 90 percent of after tax earnings.

2.2 The Monday Effect

The first workers' compensation programs came into effect during the progress movement in the 1910's[5]; around the same time Vernon (1921) was the first to notice a Monday effect in claim rates. Smith (1989) analyzed claims across several states, finding a disproportionate number of injuries on Monday's, largest for injuries that are difficult to diagnose such as lower back injuries and sprains. In conclusion, he attributed the noticeable number of Monday claims to workers using workers' compensation to cover weekend injuries. The excess fraction of injuries occurring on Monday above 20 percent – which one would expect if work hours were distributed uniformly throughout the week – has become referred to as the "Monday Effect".

Notwithstanding those initial findings, Card and McCall (1996) and Campoliete and Hyatt (2006) offer evidence that medical insurance coverage does not influence the likelihood of a worker filing a Monday claim. Card and McCall (1996) find workers likely to have medical insurance[6] are no more or less likely to file Monday claims while Campoliete and Hyatt (2006) find a Monday effect in Canada, where public medical care is freely available. Their results suggest that employees may not be abusing workers' compensation to cover the medical costs of off-the-job injuries. However, workers could have other motives for filing off-the-job injuries through workers' compensation besides medical costs.

Because workers can replace lost wages, enjoy leisure, avoid medical deductibles, and

[5] See Fishback and Kantor (1995), Table II on page 722.

[6] Evidence from Lakdawalla et al. (2007) suggests employers who offer medical insurance are also more likely to have workers' compensation claims. This could be because workplaces with large asymmetric information offer medical insurance more readily to reduce false claims, or hope that the workplace injuries may be filed through health insurance rather than workers compensation. Comparisons across medical insurance provision would need to remove such unobservables to uncover the causal effect of health care on Monday claim rates.

supplement future wages with permanent disability payments, incentives for fraudulent activity remain even if workers' have medical insurance. This could be particularly true for injuries such as sprains and strains which require resting time in addition to medical care for recovery. In addition, Baker and Krueger (1995) and Butler et al. (1996) reveal that workers can receive greater medical coverage through workers compensation – particularly in HMO settings (because doctors receive a piece rate for treating workers' compensation injuries, and a lump sum for normal patients in an HMO). The law changes in California provide a situation to further test the Monday effect as they exogenously changed both the expected benefits and difficulties in filing false claims, while temporary employment is a situation in which pronounced asymmetric information could contain more prevalent moral hazard.

2.3 California Senate Bill 899

In the United States on average, insurance costs for employers fell in the early and mid 1990's. Reasons for the decline include improved workplace safety, workers' compensation reforms, and the privatization of insurance funds. Beginning in 1999 workers' compensation costs dramatically rose in California, while they slowly increased in the rest of the United States. Between 2000-2003, workers' compensation share of payroll costs nearly doubled, rising from 1.85 percent to 3.45 percent. Figure 2 illustrates the difference between California's compensation cost as a fraction of payroll and the rest of United States.

[INSERT FIGURE 2 HERE]

Due to the rising workers' compensation costs, workers' compensation was one of the focal points of recall election of 2003, and became a target for reform shortly after Governor

Schwarzenegger took office.[7] With large legislative support, SB 899 was signed into law April 19, 2004 – with some provisions going into effect immediately and others on January 1, 2005. Its intent, as described by the California Division of Workers' Compensation, is to "control escalating medical costs...and compensation benefits".[8] The major reforms included allowing employers to choose the treating doctor through medical provider networks, requiring causal evidence linking the injury to the job, mandating AMA-approved objective medical standards in assessing disability, and limiting temporary total benefits to 104 weeks.[9] Additional reforms included providing employers incentives to return injured workers to feasible tasks through rate reductions and requiring prompt medical care.

While requiring objective medical evidence or basing disability payments on the fraction of the injury that can be causally attributed to job tasks may seem like benign changes, they can influence the ability of a worker to a file a claim for a soft-tissue injuries such as back sprains or shoulder strains. In addition, allowing employers to choose doctors may prevent employees from finding doctors who are more willing to approve workers' compensation claims[10]. Boden and Ruser (2003) find that states who change their laws in the 1990's to requiring objective medical evidence and based disability payments on causality decreased claims. The evidence on doctor choice is mixed, as Boden and Ruser (2003) establish little evidence that medical provider networks affect claims, while Neumark et al. (2005) find

[7] See "California Businesses Side with Schwarzenegger's Workers' Compensation Plan." Inland Valley Daily Bulletin, September 12, 2003. Also see "Davis to sign workers' comp reform bill: Issue has emerged in run-up to recall", San Diego Tribune, September 30, 2003.

[8] "Workers' compensation reforms under Senate Bill 899: First annual report of progress." California Division of Workers' Compensation

[9] See "Comission on Health and Safety and Workers' Compensation: SB 899 Topic summary report–version 4." Commission on Health and Safety and Workers' Compensation.

[10] Perhaps doctors could also end up under monopsonistic pressure from employers sending many patients to only a few doctors

that costs are higher and returning to work is delayed when workers choose their doctor. In addition, Ruser (1998) shows some evidence that employer choice of the doctor reduces the frequency of Monday Claims.

The reforms also sought to reduce injury durations. SB 899 offered employers deductions if employees were placed in different jobs with feasible tasks.[11] Temporary total benefits[12], which before were limited to 5 years, now became restricted to 104 weeks[13]. Lastly, prompt medical care provision required employers to cover medical costs within the first 30 days[14], regardless of whether a claim is accepted or rejected.

Because of colinearity in the timing of the changes in California, rather than trying to disentangle their partial effects, this paper assesses their net effect. All of the major changes – with perhaps one exception – could conceivably make it more difficult and also less beneficial to file a on off-the-job injury as a workers' compensation claim. And while prompt medical care guarantees the initial medical coverage of all injuries, it also requires an employee reporting an injury to visit a doctor of the employer's choosing soon after the injury is reported, which could increase the likelihood that an employer-chosen doctor uncovers evidence the claim is false.

Initial evidence suggests that net effect of the reforms statewide has been achieving its goals, with costs going down and claims decreasing in number and duration. As seen in Figure 1, total workers' compensation costs as a fraction of payroll has fallen since the

[11]Waehrer and Miller (2003) establish evidence that higher benefits and lower waiting periods increase employers' usage of restricted work.

[12]Although some previously planned increases in the temporary total benefits cap went into effect in 2005 and 2006, for the temporary workers in this anlayis only 4 percent have wages which exceed the initial threshold.

[13]With a few exceptions to this included burns, eye injuries, HIV, among other severe injuries.

[14]Capped at $10,000.

reforms, while there was no discernible change in the rest of the nation.[15] The coming section measures the size of the Monday effect prior to the reforms and also estimates the net effect of the reforms on Monday claims.

3 Initial Analysis

3.1 Data Source: Temporary Employment

Temporary employment has increased dramatically in recent years with its growth accounting for some 10 % of total job growth in the United States. We briefly digress to explain the labor market situation that is temporary employment, and how it relates to workers' compensation.

While temporary employment can refer to seasonal employees or outside professional consultants, we discuss workers provided by temporary agencies, which make up 71 percent of all temporary employment (Dey et al. 2006). The process begins when a temporary agency recruits employees who are kept on its roster according to their skills, experience, geographic locations, and work preferences. Firms needing labor approach the temporary firm and agree to pay a wage for the employee with a mark-up to the temporary firm. The mark-up is used to cover all other costs for the workers such as payroll taxes, benefits, and workers' compensation. If the leasing firm no longer wants the employee, the employee is reassigned to positions at other firms.

So while the leasing firm controls the work environment (and therefore the safety of the worker), the temporary agency is responsible for workers' compensation if the worker is

[15] In addition, initial reports done by the California Workers' Compensation Institute and California Division of Workers' Compensation suggest that lost-work spell length has decreased by 17 percent.

injured. Because the temporary firm has a minimal presence at the job site, the asymmetric information between the workers and the firm is increased because monitoring workplace safety is more difficult. Furthermore the worker has minimal ties to the firm, which makes filing claims both true and false potentially less costly as workers have reduced expectations concerning promotions. Park and Butler (2001) cite these factors in explaining their empirical observation that temporary workers in Minnesota are 3-5 times more likely to file claims compared to full-time employees.[16]

Temporary employees are indeed somewhat different from the average full-time employee in the United States. Table 1 compares full-time employees from the February Contingent Workers Supplement for 2001 and 2005 of the Current Population Survey with a representative sample of temporary workers[17] and temporary workers from the firm under study here.[18] To summarize, temporary workers in general are younger, have less education, earn less, have lower wages, and are less likely to be married. These differences are even more pronounced for the workers from the firm in this analysis, which are in the last column. In short temporary employees on average earn less than full-time employees. Consequently, they face greater replacement benefits because their incomes are less likely to be above maximum thresholds and more likely to qualify for the minimum payments mandated by each state.

[INSERT TABLE 1 HERE]

[16] Another factor that could also play a role is worker inexperience.

[17] The sample is restricted to temporary workers with positive earnings age 18-65, as in the administrative data there is only earnings for temporaries who are employeed.

[18] Workers are not required to report their characteristics through the Equal Employment Opportunity Act. If workers who drop out of high school are less likely to report their education, than the statistics may understate educational and earnings differences.

3.2 Claims Data

The claims data are the population of workers' compensation claims from a large temporary staffing agency for 2002-2006. The data include both the medical-only claims and also those involving time away from work. While some previous workers' compensation research has often used claims data classified by body part or injury type, the insurance provider in this case classifies records by injury causation. The primary causes we will focus on are overexertion and blunt trauma claims. Overexertion claims are nearly always associated with some sort of soft-tissue injury (considered difficult-to-diagnose), while blunt trauma injuries involve being struck by objects typically producing fractures, lacerations, or contusions (normally considered easy-to-diagnose).[19]

[INSERT TABLE 2 HERE]

3.3 Measuring the Monday Effect

The Monday effect has in earlier works been defined as the excess percentage of claims above 20 occurring on Monday, as that is the natural frequency that would arise if the work hours were evenly distributed throughout the week. Table 3 contains a comparison of the Monday effect between the claims in this analysis and Card and McCall (1996) and Campoliete and Hyatt (2006) for difficult-to-diagnose injuries (overexertion injuries for the temporary injury claims and back injuries for Card and McCall (1996) and Campoliete and Hyatt (2006)). Interestingly, the Monday effect is much stronger for compensation claims than for those claiming only medical benefits. The compensation claims (which are most comparable to

[19]Other easy-to-diagnose injuries such as driving accidents, burns, and eye injuries are not very common as the temporary firm seeks to avoid very dangerous jobs.

the claims data in Card and McCall (1996) and Campoliete and Hyatt (2006) because their claims has only lost-workday cases) report an excess of 7 percentage points, slightly large than excess of 5 and 6 percentage Card and McCall (1996) and Campoliete and Hyatt (2006) respectively find.

That measure of the Monday effect is mainly valid if the distribution of work hours is distributed uniformly throughout the week (all injuries and types are less likely on Friday, which suggests this may not hold). Because scaling by daily hours worked is not possible, I scale by the frequency of injuries which are most likely represent the distribution of work hours because they are easy to diagnose and require immediate attention – cuts and lacerations for Card and McCall (1996) and Campoliete and Hyatt (2006) and blunt trauma injuries for the claims from the temporary firm. When scaling by the fraction of easy-to-diagnose injuries, the Monday effect falls to around 4 percentage points for both Card and McCall (1996) and Campoliete and Hyatt (2006) and increases to over 8 percentage points for compensation claims from the temporary firm. If workers are seeking temporary benefits to replace lost wages, the much larger Monday effect observed in the temporary firm could be explained by higher replacement rates[20] and higher degrees of asymmetric information at the job site for temporary workers[21].

[INSERT TABLE 3 HERE]

The recent reforms in California provide an exogenous shock by both increasing the difficulty of filing a false claim and also reducing the potential benefits even if such a claim is

[20]The earnings of temporary workers are less often subject to the maximum thresholds and more often subject to minimum thresholds.

[21]Another driving factor could be that few temporary workers have medical insurance, but as according to the previous, there is little evidence that medical insurance has a substantial effect on workers compensation claims.

approved. Figure 2 presents the fraction of injuries occurring on Mondays for compensation claims in California, both before and after the reform. Prior to SB 899, nearly 24 percent of overexertion compensation claims were reported to have occurred on Mondays in California, with only 19 percent of injuries falling on Monday for blunt trauma injuries. After the reform the fraction of Monday claims falls for overexertion injuries in California, with essentially no change for overexertion injuries outside of California or blunt trauma injuries inside of California, to comparison groups that might indicate whether there was a substantial shift in work hour distribution.

[INSERT FIGURE 2 HERE]

The before-after comparison of effects of the laws is explored in more detail in Table 4. It contains the before after comparisons by the cause of injury (overexertion, blunt trauma), and location (in California, out of California). After the law changes (claims in 2005-2006[22]), California shows significant changes for injuries whose cause is overexertion. The fraction of claims on Mondays for overexertion injuries falls by 7.2 percentage points. Adjusting for Monday claiming frequencies in other states, this changes only slightly to 6.9. The other injuries or claim types experience no significant changes in a statistical sense, and most are small in magnitude as well. The same can be said for all injury and claim types occurring in branches outside of California, showing no significant reductions in relative Monday injury rates.

[INSERT TABLE 4 HERE]

[22]Because the some of the intital reforms went into effect in 2004, with the rest (AMA guidelines and doctor choice) goign into effect on Jan. 1, 2005. I have tried models both excluding the data from 5/2004-12/2004, or creating sepearte indicators to parse out those effects, and find no distinguishable differences.

4 Monday Claims: Regression Results

The initial evidence suggests that during the post-reform period the number of Monday injuries for difficult-to-diagnose claims fell in California. Further analysis in regressions allows one to control for occupation and individual characteristics. We proceed with linear probability models where the dependent variable is an indicator for whether or not the injury occurred on a Monday. taking the form of equation (1). The regressions control for the occupation (taken from the workers' compensation code), sex, state, replacement rate, insurance rate and are clustered by state (standard errors in difference-in-difference models use block bootstraps[23]). The main coefficient of interest is the indicator for whether the injury occurred in the post-reform period, 2005-2006. The final column takes the form of equation (2), where the effect of the policy will be measured by the interaction between a California indicator and an indicator for the post-reform period.

$$Monday_{iost} = \beta_o + X_i'\alpha + S_s + \delta * after\_reform_t + u_{iost} \tag{1}$$

$$Monday_{iost} = \beta_o + X_i'\alpha + S_s + \delta * after\_reform_t + \gamma * CA * after\_reform_t + u_{iost} \tag{2}$$

In each of the regressions i is a claim, β_o is an occupation fixed effect, X_i' is the vector of controls for the individual claim, S_s is a state fixed effect, CA is an indicator for CA, $after\_reform_t$ is an indicator for if the injury occurred after all of the reforms were in place.

[23] See Bertrand et al. (2004).

If the distribution of work hours remained constant in California, then specification (1) is sufficient to measure the decrease in the relative frequency of Monday injuries. If there were unobserved changes in the distribution of work hours that are similar within occupations and across states, specification (2) can adjust for such shifts. On the other hand, estimating the specifications for easy-to-diagnose injuries offers an additional robustness test if there were a change in work hours specific to California, as there would be a corresponding change in the probability of a Monday easy-to-diagnose injury.

The results confirm the previous summary statistics and suggest that the fraction of Monday injuries decreased in California for difficult-to-diagnose claims. For most of the specifications chosen, there appears to be no effect on Monday claims for more easy-to-diagnose blunt trauma injuries. In addition, the estimates of the decrease are quite similar across the two specifications at -0.076 for the first difference specification and -0.069 for the difference-in-difference model. With this in mind, the estimates suggest that the net of the California reforms might have eliminated the excess fraction of Monday claims for difficult to diagnose injuries.

[INSERT TABLE 5 HERE]

Earlier it was shown that the Monday effect was largest for difficult-to-diagnose injuries seeking compensation benefits, and there was only a slight excess fraction of Monday claims for medical only causes. In Table 6 the same regressions as Table 5 are estimated, separating the results by whether the claim was for compensation, or only related to medical expenses. Just as the Monday effect was largest for overexertion injuries claiming compensation earlier, that same group has the numerically largest decrease in the probability Monday injuries following the reforms. The first difference model estimate the reduction in the probability of Monday claims to be -0.09, estimated to be -0.13 for the difference-in-difference specification. Both are within the neighborhood of the 0.086 excess probability of Monday injury for overexertion compensation claims (although the difference-in-difference estimator is slightly more noisy). Once again, the probability of a Monday injury for blunt trauma claims is minimally affected by the reforms.

[INSERT TABLE 6 HERE]

Both the simple summary statistics in Section 3 and the regression results here suggest similar conclusions. Following the reforms in California, the fraction of overexertion occurring on Monday fell. Furthermore, this decrease is largest and most statistically significant for compensation claims rather than medical only injuries. The decrease in the probability of a Monday injury following the reforms is consistent with a model where the Monday effect is due to off-the-job injuries.

5 Claim Rates and Costs

5.1 Costs Per Claim

While up to now this paper has found evidence that the reforms in California influenced the probability of a worker filing a Monday claim, the main purpose of the SB 899 was to reduce claim costs, or from the workers' standpoint, lower benefits. For the temporary firm in the pre-reform period, compensation, medical and legal costs were respectively 114, 50, and 102 percent higher in California than costs per claim in other states. Regression models of the form of (3) estimate the percentage effect of the reform inside and outside of California, while those of (4) in the later model estimate the relative change in California. These regressions adjust for the same of controls as linear probability models in Section 4. As in Butler et al. (1997), incurred costs are available due to the use of administrative micro-claim data.[24] The effect of the reforms on compensation, medical, and legal costs is assessed in Table 7.

$$expense_{iost} = \beta_o + X_i'\alpha + S_s + \delta * after\_reform_t + u_{iost} \tag{3}$$

$$expense_{iost} = \beta_o + X_i'\alpha + S_s + \delta * after\_reform_t + \gamma * CA * after\_reform_t + u_{iost} \tag{4}$$

In the post-reform period, costs fell in California both relative to previous claims and adjust for changes in for temporary workers in other states. The compensation costs for all claims is estimated to fall by 48 percent relative to claims in other states, while medical and legal costs fall by 56 and 40 percent.[25] While each of these decreases is substantial, recall the margin by which California costs exceeded those from other states in the pre-reform period. While the reforms have decreased the gap between California and claims from other states, in the post-reform period costs per claim continue to be somewhat higher for the compensation, medical, and legal categories – respectively by 45, 1, and 38 percent.

[INSERT TABLE 7 HERE]

[24]98 percent of the claims are closed, suggest the costs per claim are relatively complete.

[25]This scaling the dollar decrease in costs by the 2002-2004 average costs for California which were respectively \$4,561, \$5,142, and \$2,451 for compensation, medical, and legal/travel expenses paid.

5.2 Claim Rates

In addition to affecting the relative frequency of Monday claims, the reforms in California could also reduce the aggregate frequency of injuries. Due to the decreases in potential benefits caused by more objective standards in assessing disability and also limits in temporary disability payment length, workers might see less returns in filing claims for injuries. Furthermore they could also exhibit more effort to reduce their exposure to danger at work. Figure 4 presents the number of claims per FTE filed over 2002-2006 both inside and outside of California. By the first quarter of 2005, the number of claims falls in California but experiences only a slight decline in branches in other states. This is similar to evidence from Butler et al. (1997), who also study a single large employer and find that claim rates decrease with lower benefit levels.

The magnitude of the decrease in claim rates is explored in further detail in Table 8. In order to estimate the effect of the reforms on claim rates, once again claims in other states form a counter-factual group. The injuries are normalized by either full-time equivalents (FTE) in equation (5), or alternatively by workers compensation premiums (WCP) paid in equation (6).[26] The log of the injury rate with either normalization is the dependent variable in the regression models, which allows the coefficients to be interpreted as percentage effects. A monthly time series is constructed for both California and all offices outside of

[26]Previous studies have often relied only claim rates adjusted by FTE, and constructing injury rates by industry or occupation codes to absorb differences in risks associated with industry or occupation shifts. This is attractive in settings with enough claims to avoid many occupations and industries having 0 injuries. While the individual workers compensation occupation codes are available for employees and injured workers in the administrative data, aggregating to only workers' compensation occupation code level could introduce many zero counts. By instead aggregating total hours weight occupation cells by 2006 premiums (to keep the measure of risk associated constant), produces a measure of weighted employment that is essentially FTE weighted by relative risk. Thus a monthly time series is constructed for both California and all offices outside of California over the 2002-2006 sample, and month dummy variables are included to control for seasonality.

California over the 2002-2006 sample, and month dummy variables are included to control for seasonality.

$$\ln\left(\frac{injuries}{FTE}\right)_{mct} = m_m + after_t + CA + \gamma * CA * after_t + u_{mct} \tag{5}$$

$$\ln\left(\frac{injuries}{WCP}\right)_{mct} = m_m + after_t + CA + \gamma * CA * after_t + u_{mct} \tag{6}$$

The point estimates from column 3 (which adjust for common trends to the company or nation) of Table 5 suggest the total claims per FTE or WCP fell by either 19 or 16 percent, respectively. Similarly, total overexertion claims decreased by 34 or 32 percent, while blunt trauma injuries declined by 44 or 42 percent. The difference between normalizing factors in column 3 are minimal, with point estimates remaining robust to either normalizing factor.[27]

[INSERT TABLE 8 HERE]

5.3 Overall Cost Analysis

Through the analysis in this paper, it has been shown that the fraction of injuries occurring on Monday for difficult-to-diagnose fell in California, as did claim rates and claim costs. This section uses the previous estimates to provide a relatively simple counter-factual view of the world. If the reforms had gone into effect earlier in California, what would have been the claim rates, costs, and the excess number of Monday injuries. The results from Tables

[27] Another approach would be to run a linear probability model or probit for whether or not an injury occured for using each individual worker. Results for each individual workers from 2002-2006 are reported in Table 3 in the appendix. Table 4 in the appendix runs similar models to equation 6 breaking down the difference by medical only and compensation injuries.

5, 7 and 8 are used in the construction of the counter-factuals and are presented in Table 9.

[INSERT TABLE 9 HERE]

As shown in Table 9, the total costs due to injuries have fallen substantially since the reforms. Combining the reduction in benefits with the decrease in overall claims rates, the overall costs of injuries for 2002-2005 would have been nearly 23 million dollars lower if the reforms had already been in place. Of this, the reduction of the Monday effect for difficult-to-diagnose injuries accounts for between 1.8 to 3.5 percent of the total decrease in costs, and at most 8 percent[28] of the decrease in claims.

6 Conclusions

This paper provides evidence on the excess number of Monday injuries in workers' compensation. Using detailed claims and employment data from a large temporary agency, it is shown that major reforms in California due to SB 899 were followed by a reduction in the number of Monday injuries for difficult-to-diagnose claims. Similarly, both the number of claims per FTE and costs per claim fell absolutely and relative to branches in other states following the reforms.

Given this evidence, can one infer that the Monday effect – or some fraction of it – is due to weekend injuries being filed through workers' compensation? Consider some other physiological explanations such as weekend overactivity. Because of the decrease in the total number of injuries following the reforms, one could argue that workers are exhibiting more

[28] If one measures the excess number of Monday injuries as defined by compensation claims, as that was the only subcategory significant on its own, it amounts to only 5 percent.

effort in safety at the job-site. If the increased safety effort of employees is making them less prone to injury in general, one could argue that the higher safety effort levels would also make Monday injuries whose source is weekend activity or inactivity – and not fraudulent claims – less likely.

However, the Monday effect is largest for claims seeking compensation benefits, which suggests that the Monday effect may be driven by workers seeking time away from work in additional to medical benefits. Furthermore, the compensation-related overexertion injuries, the group with the largest Monday effect, are also those with the largest decrease in the probability of filing a Monday claim following the reforms. Given these additional findings, the evidence from this large temporary firm and the policy changes in California is most consistent with a model where some fraction of the Monday effect can be attributed to off-the-job injuries.

Lastly, it must be noted that although there is evidence that the substantial reforms in CA are associated with a reduction of excess Monday claims for difficult-to-diagnose injuries, both overall claim costs and claim rates were also affected by the policy changes. When accounting for these differences, the cost of claims filed in 2002-2004 would have been reduced by \$23,000,000 in CA. Of this, the elimination of excess Monday injuries amounts to at most \$630,000, or 3.5 percent of the total reduction in costs. With that in mind, although policies may exist which can reduce the excess number of Monday claims being filed, any differential effects on Monday claims will most likely be dwarfed by other first-order responses in claiming behavior.

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7 Tables and Figures

Figure 1

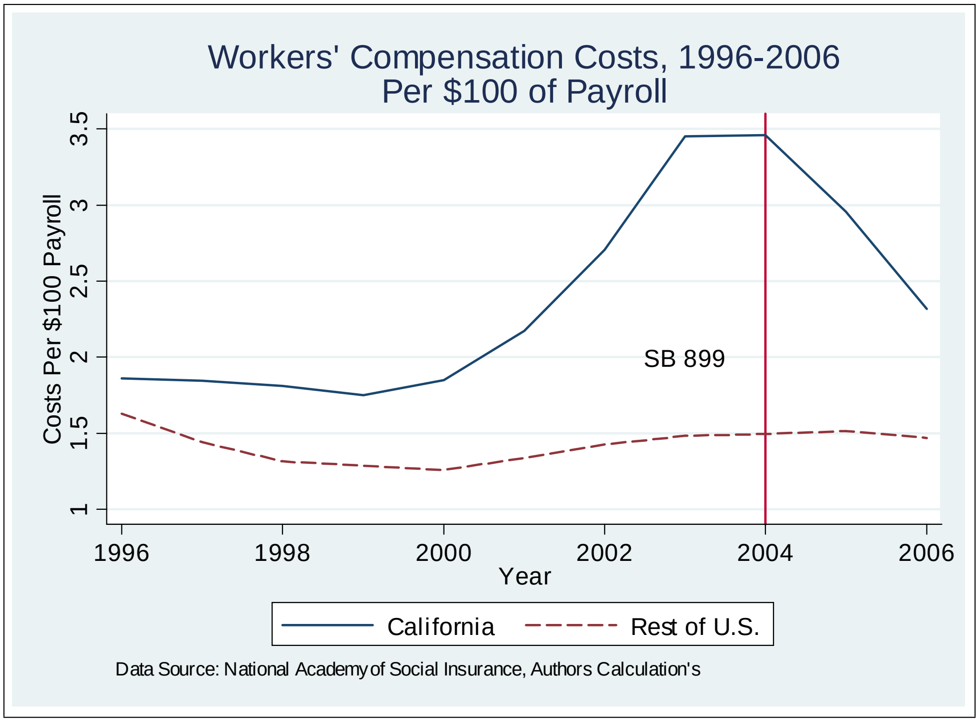


Figure 2

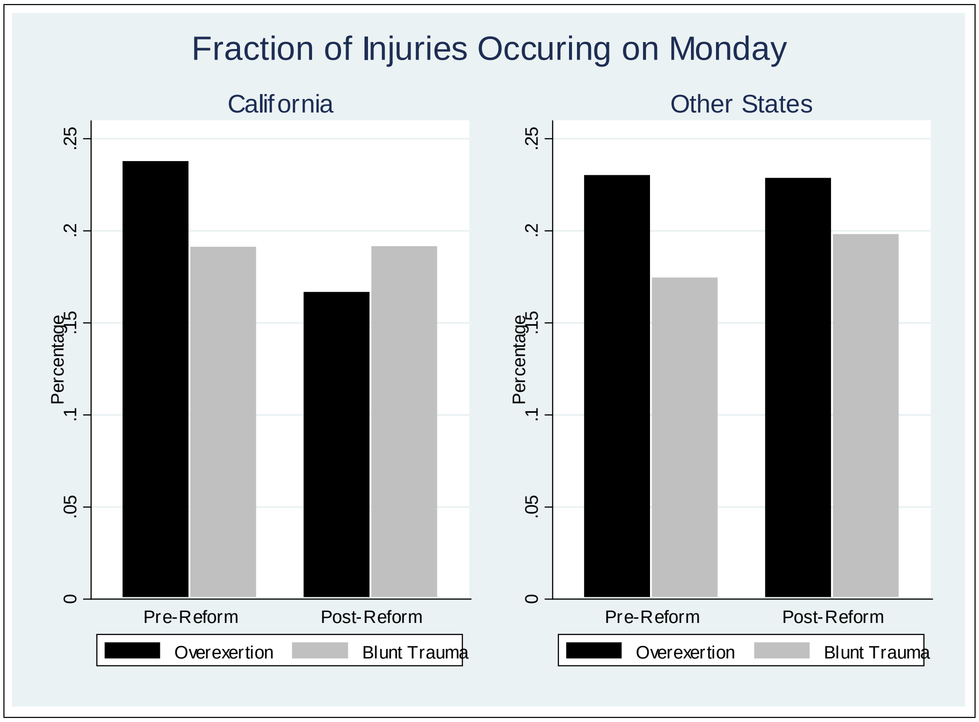
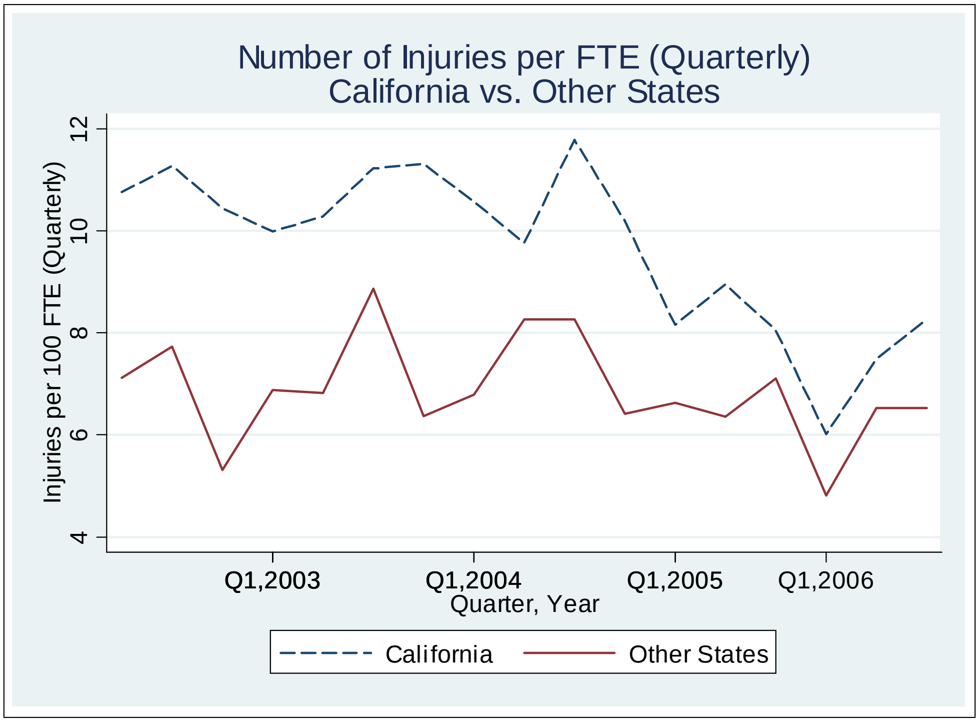

Fraction of Injuries Occuring on Monday
California
Other States
Percentage
0
.05
.1
.15
.2
.25
Pre-Reform
Post-Reform
Overexertion
Blunt Trauma

Figure 3



Number of Injuries per FTE (Quarterly)
California vs. Other States
Injuries per 100 FTE (Quarterly)
4
6
8
10
12
Q1,2003
Q1,2004
Q1,2005
Q1,2006
Quarter, Year
California
Other States

Table 1: Summary Statistics

	Full-Time (CPS)	Temp-Emp (CPS) Nationwide	Temp-Emp (Firm)	Full-Time (CPS)	Temp-Emp (CPS) California	Temp-Emp (Firm)
Age	38.3	37.4	31.0	37.5	37.7	31.9
Never Married	29.2	37.5	-	31.6	36.1	-
$<=$HS Grad	44.6	47.6	69.0	45.5	47.7	72.6
BA or More	29.0	15.2	11.2	29.5	13.8	10.0
Male	62.3	44.2	53.3	64.3	36.1	55.6
Weekly Earnings	$738.14	$507.68	$248.20	$763.87	$511.83	$253.10
Hourly Wage	$14.02	$13.01	$8.85	$14.14	$13.82	$8.96

Columns 1-2 and columns 4-5 are taken from the CPS Contingent Worker Supplements in 2001, 2005, and columns 1-2 are weighted to match with the distribution of workers from the national firm. Column 3 and 6 are from administrative and payroll records from the national staffing agency.

Table 2: Summary Statistics

Monday	20.6
	(40.5)
Overexertion	29.9
	(45.8)
Blunt Trauma	42.9
	(49.5)
Compensation Claim	28.2
	(45.0)
California	47.3
	(50.0)
Fraction Male	65.3
	(43.5)
Avg. Weekly Wage (Dollars)	334
	(199.5)
Avg. Weeks Worked	25.6
	(35.8)
Days Between Injury & Report	18.2
	(98.8)
Compensation	2597.3
	(10319.3)
Medical	3451.8
	(18119.6)
Legal & Travel	1402.0
	(5151.9)
Weekday Injuries	8047
Weekend Injuries	983

This table contains summary statistics for claims data in the analysis.

Table 3: Measuring Excess Monday Claims

	Overexertion Injuries			Card & McCall	Compoliete & Hyatt
	All	Compensation	Medical Only	Lost Time Back Injuries	
Monday Effect Above 20 Percent					
"Excess" Monday Claims	3.8***	6.8***	1.6	5.3***	6.2***
(in CA Prior to Reform)	(1.3)	(2.0)	(1.7)	(0.5)	(0.7)
"Excess" Monday Claims	3.0***	7.2***	0.9		
(outside of CA)	(1.2)	(2.0)	(1.4)		
Monday Effect Relative to Difficult-to-Diagnose Injuries					
"Excess" Monday Claims	4.4***	8.6***	1.8	4.1***	4.2**
(in CA Prior to Reform)	(1.6)	(2.7)	(2.0)	(1.3)	(2.2)
"Excess" Monday Claims	4.6***	8.3***	2.5		
(outside of CA)	(1.5)	(2.9)	(1.7)		

Notes: This table summarizes the excess fraction of claims on Mondays. The first three columns indicate the excess fraction of Monday claims for overexertion injuries by claim type for both California and other states.
The forth and fifth columns contain estimates for low-back injuries from Card & McCall (1995, 1996) and Compoliete & Hyatt (2006).
The first two rows report the excess fraction of difficult-to-diagnose injuries on Monday above 20 percent, while the bottom two rows indicate the excess fraction above the fraction of easy-to-diagnose injuries reported on Monday.
* sig. at 10 percent. ** sig. at 5 percent. *** sig. at 1 percent.

Table 4: Before-After Comparisons

Location	Monday Injuries Relative Frequency 2002-2004	Monday Injuries Relative Frequency 2005-2006	Difference	|T-Test|	Diff-in-Diff	|T-Test|
	(1)	(2)	(3)	(4)	(5)	(6)
All Injuries						
California	20.8	19.6	-1.1	0.78	-1.7	0.89
Not-California	20.6	21.1	0.6	0.46	-	-
Overexertion						
California	**23.9**	**16.7**	**-7.2**	**2.64**	**-6.9**	**1.84**
Not-California	23.1	22.8	-0.3	0.14	-	-
Blunt Trauma						
California	19.1	19.0	-0.1	0.10	-3.2	1.08
Not-California	17.2	20.2	3.0	0.54	-	-

Notes: This table shows the Fraction of Injuries Occurring on Monday, both before and after the law change. Statistically significant results are highlighted in bold.

* sig. at 10 percent. ** sig. at 5 percent. *** sig. at 1 percent.

Table 5: Effect of Reforms on Probability of Monday Claim

Injury	Claim Type	First Difference California	First Difference Not-California	Diff-In-Diff	Diff-in-Diff
		(1)	(2)	(3)	(4)
All	All	-0.021	0.0048	-0.020	0.026
		(0.016)	(0.013)	(0.014)	(0.022)
Overexertion	All	-0.076**	0.0067	-0.069*	-0.084
		(0.030)	(0.027)	(0.037)	(0.050)
Blunt Trauma	All	-0.004	0.021	-0.023	0.014
		(0.028)	(0.020)	(0.022)	(0.038)
Controls					
State Fixed Effects		N/A	Yes	Yes	Yes
State Specific Linear Trends		No	No	No	Yes

Notes: The dependent variable in all regressions is whether a claim occurred on a Monday, estimated by linear probability models. Included controls are state and occupation fixed effects, weeks worked, sex, insurance rate, and wage replacement rate. First difference models use heteroskedastic robust standard errors while the difference-in-difference models cluster by state and use block bootstrap errors.
* sig. at 10 percent. ** sig. at 5 percent. *** sig. at 1 percent.

Table 6: Effect of Reforms on Monday Claims: By Claim Type

Claim Type	Compensation		Med-Only	
	(1)	(2)	(3)	(4)
Overexertion	-0.09**	-0.13*	-0.06	-0.03
	(0.04)	(0.07)	(0.05)	(0.02)
Blunt Trauma	0.02	0.03	-0.02	-0.04
	(0.05)	(0.06)	(0.04)	(0.04)
"Monday Effect" Prior to Reforms	0.09		0.02	
Specification	First Diff	Diff-in-Diff	First Diff	Diff-in-Diff

Notes: The dependent variable in all regressions is whether a claim occurred on a Monday, estimated by linear probability models. Included controls are state and occupation fixed, sex, insurance rates, and the wage replacement rate. First difference models are CA only and use heteroskedastic robust standard errors. Difference-in-difference models use block bootstrap errors and cluster by state.
* sig. at 10 percent. ** at 5 percent, *** sig at 1 percent.

Table 7: Effect of Reforms on Per Claim Claim Benefits/Costs

Expense	Injury	First Difference		Diff-in-Diff
		California	Not-California	
Compensation	All	-2627.32***	-221.36	-2178.79**
		(758.34)	(359.90)	(1056.50)
Compensation	Overexertion	-2578.51***	111.32	-2247.88**
		(464.5465)	(246.52)	(1078.54)
Compensation	Blunt Trauma	-2637.63***	128.54	-2010.50**
		(830.88)	(313.36)	(1005.07)
Medical	All	-3224.15***	-115.14	-2902.02**
		(535.70)	(464.77)	(1395.11)
Medical	Overexertion	-4093.28***	714.87**	-4252.30**
		(844.94)	(241.52)	(1993.27)
Medical	Blunt Trauma	-3296.69***	-1178.41	-2317.47*
		(1088.73)	(1251.10)	(1300.6)
Legal	All	-1217.30***	26.96	-981.95**
		(227.15)	(107.45)	(484.85)
Legal	Overexertion	-1429.05***	51.20	-1192.85**
		(414.14)	(168.18)	(592.91)
Legal	Blunt Trauma	-957.14**	32.673	-562.91
		(422.25)	(170.04)	(343.31)

Notes: The dependent variable in all regressions is the benefits/costs for a claim estimated by OLS. Controls are state and occupation fixed effects, sex, insurance rate, and wage replacement rate. The first difference models use heteroskedastic robust standard errors, while difference-in-difference models use block bootstrap errors and cluster by state. * sig. at 10 percent. ** at 5 percent, *** sig at 1.

Table 8: Percentage Effect of Reforms on Claim Rates

	Normalizing Factor	First Difference		Diff-in-Diff
		California	Not-California	
		(1)	(2)	(3)
All Injuries	FTE	-0.30***	-0.12*	-0.19**
		(0.06)	(.06)	(0.07)
Overexertion	FTE	-0.40***	-0.11	-0.34**
		(0.10)	(0.09)	(0.13)
Blunt Trauma	FTE	-0.56***	-0.10	-0.44***
		(0.09)	(0.07)	(0.11)
All Injuries	WCP	-0.12*	0.076	-0.16**
		(0.06)	(0.077)	(0.08)
Overexertion	WCP	-0.22**	0.07	-0.32**
		(0.10)	(0.10)	(0.13)
Blunt Trauma	WCP	-0.37***	0.08	-0.42***
		(0.09)	(0.08)	(0.11)

Notes: These regressions use an aggregated monthly time series of the log of the number of injuries normalized by FTE or the workers' compensation insurance paid. All OLS regressions include monthly indicators to adjust for seasonality, and regressions report robust standard errors which were 10 percent larger than those correcting for first-order autocorrelation.
* sig. at 10 percent. ** sig. at 5 percent. *** sig. at 1 percent.

Table 9: Hypothetical CA Costs 2002-2004 if Reforms in Place

	2002-2004	Counter-factual
Claims	3137	2541
Per Claim Cost	\$12,161	\$6,098
Total Cost	\$38,150,000	\$15,500,000
Excess Overexertion Monday Claims/Costs		
Overexertion Claims	65	0
Total Cost of Monday Effect (02-04 costs)	\$790,000	0
Total Cost of Monday Effect (05-06 costs)	\$396,000	0
Monday Effect's	3.5	1.8
Percentage of Cost Reduction	(cost 02-04)	(cost 05-06)

Notes: This table presents a counter-factual view of what costs and claims would have been if the reforms had already been in effect during 2002-2004. The last row shows what fraction of the reduction in total costs can be attributed to the reduction in Monday difficult-to-diagnose injuries. The calculations are based on the estimates from tables 5, 7, and 8.

8 Appendix

8.1 Litigation

While workers compensation is intended to be a no-fault insurance system, many claims still end up in litigation. This could be because firms believe the claim to be false, or the firm could act strategically to deny claims they believe will "go away" (Card and McCall 2006). For the firm in question, roughly 10 percent of all claims are litigated, with nearly 30 percent of compensation claims resulting in legal dispute. The model in Card and McCall (1995) suggests that employers are more likely to litigate claims they believe to be false. If a disproportionate number of Monday injuries were due to fraudulent claims, firms would have incentives to more closely monitor such claims. However, Card and McCall (1996) find that Monday claims were no more or less likely to be denied than claims on other days of the week.

An analysis of the compensation claims reveals that for the temporary firm in this analysis, Monday claims appear more likely to be litigated outside of California. In addition outside of California, the odds of litigation increase with the delay between the reporting of a claim is delayed and its reported date of occurrence. In California, the day of week does not strongly effect the odds litigation for claims (this true for both the pre and post-reform period, while they are reported together). However a detailed report by the Rand Institute for Civil Justice in 2003 found that litigation in California often occurs even where there are no disputes, and along with this finding delaying the filing of a claim has no bearing on litigation in California.

[INSERT APPENDIX TABLE 2 HERE]

8.2 Additional Claim Results

Appendix Table 3 contains a linear probability model which estimates whether or not an injury occurred for each employee from 2002-2006. Controls are included similar to the previous regressions, also controlling for insurance risk associated with the occupation and also whether the worker had a criminal history. We find very similar estimates to Tables 5 and 8 – with both the incidence of injuries has going down in California following the reforms, and a reduction in Monday injuries that is specific to difficult-to-diagnose causes.

[INSERT APPENDIX TABLE 3 HERE]

Table 4 contains the difference-and-difference claim per fte results separated by medical only and compensation claims. Columns 1 and 2 of Appendix Table 4 respectively report the number of medical only versus compensation claims. Given that medical only claims are also falling, this could be evidence that workers are being safer at the job site. The effect on compensation claims is similar in magnitude for overexertion and blunt trauma claims – with the estimates for overexertion exhibiting slightly more noise. The effect on blunt trauma medical claims is much larger than the medical effect for overexertion claims, suggesting that the decrease in claims amongst the blunt trauma injuries could be partially driven by increased safety effort amongst employees.

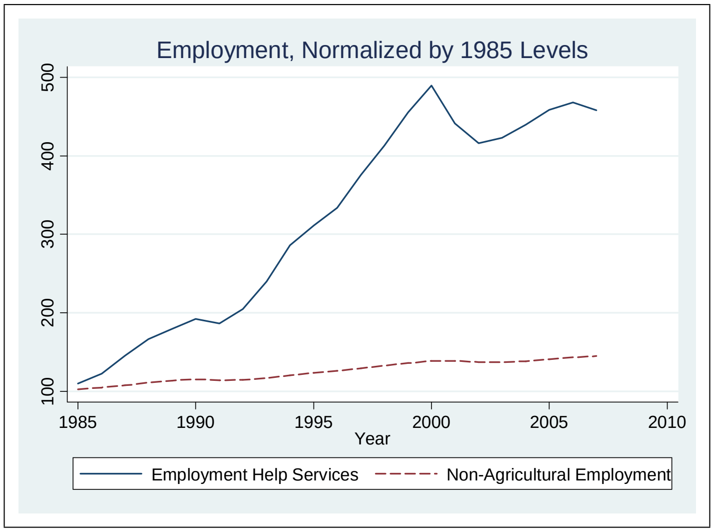
[INSERT APPENDIX TABLE 4 HERE]

8.3 Robustness Checks: Placebo Treatments 1998-2001

In econometric analysis of policy changes using difference-in-difference style estimation, it is important to consider the role autocorrelation can play (Bertrand et al. 2004 and Cameron et al. 2008). As shown in Bernard et.al (2004), failing to account for such dependence in the error terms can lead to over-rejection of the null hypothesis. There are several reasons this issue would be less severe in our data. First, the sample time period under consideration is relatively short. In addition, while wages, a variable that has consistently growing on average over time–are studied in Bernard et.al, the reasons for the fraction of claims occurring on Monday exhibiting strong dependence is not obvious. Nonetheless, additional claims data for the same company from 1998-2001 provide a potential placebo test group. To test what effects autocorrelation could play in detecting changes in the relative frequency of Monday claims or claim costs we randomly generate laws for a time period under which there is no large changes in laws. We find no evidence of over-rejection suggesting that the size in our tests may be close to the nominal level.

[INSERT APPENDIX TABLE 5 HERE]

Appendix Figure 1



Data Source: Current Employment Survey, Author's calculations

Appendix Table 1: Employment/FTE By State

State	Employees	FTE
AL	334	36.2
AR	1818	234.9
AZ	9928	1771.0
CA	112689	35659.8
CO	8726	1575.0
CT	1066	295.8
DE	1233	209.8
FL	28941	4876.9
GA	6394	1295.6
HI	1909	331.6
IA	8260	1728.3
ID	1409	161.2
IL	15288	2445.9
IN	2717	421.6
KS	548	99.4
KY	5653	731.9
LA	6800	1331.3
MA	3414	756.5
MD	1705	226.7
MI	2640	472.9
MN	312	70.2
MO	2405	322.9
MS	629	5.70
NC	4034	663.9
NE	4324	589.8
NH	189	33.1
NJ	2389	440.8
NM	50	0.07
NV	3994	584.4
NY	5017	767.3
OH	28647	4215.3
OK	6303	939.9
OR	2376	292.8
PA	7832	1857.3
SC	4150	938.1
TN	24587	6080.1
TX	32726	6839.0
UT	1949	368.0
VI	10688	1777.5
WA	1921	5244.4
WI	9716	1418.6

Employment/FTE By State

Appendix Table 1: Probability of Litigation

	Outside of California			California		
Dependent Variable	All Injuries	Overexertion	Blunt Trauma	All Injuries	Overexertion	Blunt Trauma
All Claims						
Monday	−0.0028	.047***	−0.031	0.008	0.021	0.021
	(0.0073)	(0.017)	(0.0075)	(0.014)	(.027)	(0.027)
Days (100's) from Inj. Rpt	0.014	0.041	−0.005	0.0024	0.0014	−0.0039
	(.010)	(0.027)	(0.014)	(0.0039)	(.0062)	(0.021)
Compensation Claims						
Monday	−0.029	0.085*	−0.14***	−.014	−0.045	0.012
	(.019)	(.045)	(0.037)	(.040)	(0.056)	(0.074)
Days (100's) from Inj. Rpt	0.18***	0.24***	0.07	−0.0145	−0.0145	−0.02
	(.054)	(0.090)	(0.06)	(0.006)	(0.008)	(0.017)
State Controls	*Yes*	*Yes*	*Yes*	*N/A*	*N/A*	*N/A*
Occupation Controls	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Individual Controls	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*

Notes: The dependent variable in the regressions is whether or not the claim is litigated estimated by linear probability models. Controls include state and occupation fixed effects, the replacement rate, sex, weeks worked, and time between injury and filing. All regression use robust standard errors. * sig. at 10 percent. ** at 5 percent, *** sig at 1 percent .

Appendix Table 2: Probability of Injury(*100) using All Workers

	Injured	Overexertion	Blunt Trauma	Monday Overexertion	Monday Blunt Trauma
CA*After	-0.27***	-0.1**	-0.26***	-0.078***	-0.003***
	(0.1)	(0.05)	(0.1)	(0.009)	(0.002)
Ref. Assoc.	0.24***	0.06**	0.12***	0.02*	-0.016
	(0.06)	(0.03)	(0.04)	(0.1)	(0.01)
Criminal	0.39*	-0.04	0.36*	-0.013	0.15*
	(0.2)	(0.2)	(0.15)	(0.04)	(0.07)
Avg. Gross	-0.01***	-0.004***	-0.004***	-0.0009***	-0.0004
	(0.001)	(0.0001)	(0.0001)	(0.0002)	(0.0005)
Avg. Hours	0.3***	0.06***	0.01***	0.002***	0.001*
	(0.02)	(0.009)	(0.005)	(0.0004)	(0.006)
Weeks Worked	0.012***	0.002***	0.012***	0.0003**	0.001***
	(0.001)	(0.001)	(0.001)	(0.0001)	(0.0003)
Mean Injury Rate in CA Prior to Reforms	2.0	0.6	1.00	0.13	0.12

Notes: The regressions estimate linear probability models for whether or not an injury is reported by a worker. Controls include gross earnings, sex, weeks worked avg. hours weekly hours weekend, criminal conviction, whether they were referred by another employee, occupation fixed effects, state fixed effect, insurance rates.
All regression report robust standard errors. All estimated coefficients are multiplied by 100.
* sig. at 10 percent. ** sig. at 5 percent. *** sig. at 1 percent.

Appendix Table 4: Effect of Reforms on Claim Rates, by Claim Type

	Normalizing Factor	Medical (1)	Compensation (2)
All Injuries	FTE	-0.19**	-0.25*
		(0.09)	(0.13)
Overexertion	FTE	-0.39**	-0.30
		(0.18)	(0.18)
Blunt Trauma	FTE	-0.51***	-0.29**
		(0.14)	(0.15)
All Injuries	WCP	-0.16*	-0.23*
		(0.09)	(0.13)
Overexertion	WCP	-0.37**	-0.28
		(0.17)	(0.19)
Blunt Trauma	WCP	-0.49***	-0.27*
		(0.14)	(0.16)

Notes: These regressions use an aggregated monthly time series of the log of the number of injuries normalized by FTE or the workers' compensation insurance paid. These regressions are difference-in-difference models and are comparable to equation 6. All regressions include monthly indicators to adjust for seasonality, and regressions report robust standard errors which were 10 percent larger than those correcting for first-order autocorrelation.
* sig. at 10 percent. ** sig. at 5 percent. *** sig. at 1 percent.

Appendix Table 5: Null Rejection Frequency for Placebo Treatment Groups

	All Claims	Medical	Compensation
Monday Claims			
	0.050	0.032	0.054
Claim Costs			
	0.048	0.05	0.044

Notes: This table presents null rejection frequency when treated and control groups were randomly assigned during the 1998-2001 years, a period where no substantial policies changes took place. Using the same estimation and clustering strategy the rejection were at levels close to the nominal level.