



MONDAY MORNING CLAIMS

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Abstract

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Keywords

workers compensation, soft-tissue injuries, monday effect, asymmetric work aversion

Cover Page Footnote

Richard J. Butler is Professor at Brigham Young University. Nathan Kleinman is Vice President, Healthcare Analytics at xG Health Solutions. Harold H. Gardner, MD, is CEO of the HCMS Group. Data employed in this article are proprietary; correspondence concerning it can be directed to Harold (Hank) Gardner at Hank_Gardner@hcmsgroup.com.

I DON'T LIKE MONDAYS: EXPLAINING MONDAY WORK INJURY CLAIMS

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More workers' compensation claims for soft-tissue injuries are filed on Monday than on any other day of the week. Explanations for the Monday claims include "warm-up" or ergonomic effects, false classification of off-the-job weekend due to economic incentives, or psychological responses to Monday work. To sort out these possibilities, the authors examine more than 200,000 employment day patterns for a single, large U.S. employer with uniform human resource policies. Although the authors find more soft-tissue injury claims (mostly sprains and strains) filed for younger workers, union members, and for workers with higher expected workers' compensation benefits, they do not find that these factors—nor the absence of health insurance—differentially increase soft-tissue injury filings on Monday. Moreover, comparing soft-tissue injuries with lacerations and broken-bone claims suggests soft tissues are not due to ergonomic factors either. Additional evidence suggests that workers simply do not like Monday work. Hence, it may be cost-effective for employers and employees to institute practices that make the Monday workplace more attractive.

Some of the most interesting social policy questions of our time concern incentive responses that arise between public and private social programs. Do extended unemployment insurance benefits, or easing of Social Security Disability Insurance system's de facto requirements for eligibility, decrease incentives to work and hence indirectly affect the long-term demand for community support for food or housing? Will the extension of publically subsidized health benefits associated with the Affordable Care Act decrease the demand for private insurance? Or do changes in any of these programs affect individual's incentives to self-insure in terms of adopting a healthier lifestyle? Such inter-program externalities potentially have profound effects on the occupational safety and health of workers in the United States, and hence, cut across many of the programmatic concerns of the U.S. Department of Labor.

Workers' Compensation (WC) is the oldest social insurance program in the United States, exhibiting significant overlap with health insurance, employer-provided sick leave and disability benefits, Social Security Disability

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Insurance benefits, and unemployment insurance. It provides, in short, many opportunities to explore the empirical importance of inter-program responses to incentives.

WC in the United States covers all medical expenses and a substantial fraction of lost wages for injuries or occupational diseases occurring on the job. The WC system is large: in 2009, \$58.4 billion of WC benefits were paid out to workers, more than half going for health care expenditures and slightly less than half for lost work-time pay. The cost to firms of the system in 2009 was \$73.9 billion (Sengupta, Reno, and Burton 2011).

Though each state has its own WC system, these systems are broadly consistent across states and similar to many disability systems outside the United States. WC laws make employers liable for all medical expenses and a portion of lost wages of an injured worker. The laws also provide for rehabilitation services and the payment of income benefits to dependents for workplace fatalities. The employer is generally liable to pay these benefits for any injury arising out of and in the course of employment, regardless of who is at fault. The liability imposed on the employer is exclusive in the sense that the injured worker cannot sue for additional compensation, such as for pain and suffering.

With respect to WC benefits, all state laws require nearly 100% coverage of medical expenses and some minimum cash benefits related to lost earnings for those out of work longer than the state-specific waiting period (2 to 7 days). Whether as compensation for lost earnings from temporary or permanent injury, or to survivors in the event of death, cash benefits for lost wages are usually two-thirds of the workers' weekly pre-injury earnings, subject to a minimum and maximum benefit. Medical costs associated with a workplace injury are compensated on a fee-for-service basis, employing the "usual and customary" fees for the local health care market. Whether chiropractic care is reimbursed depends on state statutes regulating WC claims.

For this article, we are concerned with the potential interaction of health insurance and the WC benefits. Employees seeking payment for health conditions not strictly job-related generally have health insurance or sick leave to help defer the costs of care or time away from work, which generally are not quite as generous as WC payments. While WC insurance is a mandated social insurance (benefits determined by individual state statute and required of most employers), health care insurance and sick leave are provided by the firm on a voluntary basis, usually by larger firms in response to market pressures for nonwage benefits. Although workers do not make any premium or copayments under a state's WC system, they often pay part of the monthly premium for health care insurance and co-payments for many types of health care at the time of treatment.

More Workplace Injuries on Monday

Co-payments for health insurance are potentially interesting because more WC claims are filed on Mondays, and in particular, more hard to diagnose

or mostly soft-tissue injuries are filed on Mondays than on other days of the week. We use “soft tissue” interchangeably with health conditions that are difficult to explicitly measure: the nature of the injury codes include “Bruise/Contusion,” “Headache,” “Nausea,” “Sprain/Strain,” “Illness,” “Carpal Tunnel Disease,” and “Emotional/Stress/Mental Disorder.” These interchangeable terms have suggested a possible program externality between WC, with no health care co-payments, and health insurance, usually with health care co-payments. Smith (1990), who first noticed the Monday filing phenomenon, hypothesized that workers without health insurance, or with relatively higher health insurance with co-pays or deductibles, might report weekend injuries as having occurred on the job on Mondays. In particular, as easy-to-assess injuries like lacerations and broken bones are unlikely to go untreated over the weekend, Smith hypothesized that the Monday reporting effect should be more pronounced for soft-tissue injuries than readily measured injuries.

We explore alternative explanations for the increased likelihood of soft-tissue Monday injuries: asymmetric aversion-to-work (returning to work after a weekend away is harder than staying at work); economic response (moral hazard) to insurance; or ergonomic response, meaning workers employed in a customary Monday-through-Friday job are just not sufficiently warmed up for work at the beginning of their workweek, Monday, and hence have more injuries then. The potential validity of these explanations has important implications for evaluating government workplace health and safety policies; moreover, knowing the source of the Monday effect may help firms design cost-effective methods of reducing workplace injuries.

Health Insurance Compared with Workers’ Compensation

Not all health care conditions are covered under both WC and employer-provided health care insurance. WC insurance covers all traumatic workplace injuries, but exclusions are often made for mental health care or workplace stress claims. Non-specific low-back pain is covered, as are other types of sprains and strains, but nominally they must be work-related. Firms do not have to provide their employees with health care insurance, but if non-self-insured firms choose to provide health care insurance, some states require the firms to provide specific provisions in their health care insurance, such as benefits for births or mental health care.

Like health care insurance, sick leave is voluntarily provided by employers, with a schedule of benefits generally determined by job tenure and exempt/nonexempt status (i.e., broadly, whether the worker was a manager and exempt from the Fair Labor Standards Act provisions for overtime pay). For example, after a trial employment period, the workers in our sample may receive five days of sick leave per year in addition to paid holidays and two weeks of paid vacation. Workers use sick leave during periods of temporary sickness or to stay home and address their health needs without losing pay or their jobs. Some policies also allow workers to use sick leave to care

for family members. Unlike WC, sick leave is generally of limited duration in the United States, usually amounting to one or two weeks per year.

To consider incentives, including WC insurance coverage that generates moral hazard response, that might influence soft-tissue injuries filed on a Monday, assume a worker has a soft-tissue health condition that may qualify for WC insurance coverage. The worker can increase the likelihood of compensability under WC by putting effort g in the claims-filing process, including such steps as convincing the firm (work supervisors, for example) that the soft-tissue injury arose on the job; meeting and filing the appropriate paperwork with the company's risk managers or human resource department; and possibly convincing a company occupational physician, or company-chosen physician, that the claim really is job related rather than age related and did not occur off the job. Effort spent in the WC benefits process comes at the expense of work effort, h , which determines a worker's wage. That is, (normalized) total effort is divided between filing a soft-tissue injury, g , and more time spent in producing output for the firm, h , as follows:

$$(1) \quad 1 = h + g$$

The larger g , the greater the likelihood of a soft-tissue WC that pays benefits B (benefits are virtually always less than the wages, W). If the soft-tissue health condition is classified as a WC claim, there are no medical co-pays, c . But as g increases, h must fall, and wages are increasing in h :

$$(2) \quad \frac{\partial \pi(g)}{\partial g} = \pi' > 0 \text{ and } \frac{\partial W(1-g)}{\partial g} = -\frac{\partial W(h)}{\partial h} \equiv -W' < 0$$

where $\pi(g)$ is the likelihood of getting the health condition classified as a WC claim, and $W(1-g)$ is the wage function (as an implicit function of productive labor, h).

The potential moral hazard response for the group of individuals with a soft-tissue health condition then is simple. Since WC pays virtually all medical expenses (without any worker co-pays) and provides partial reimbursement for lost wages, B , for workers with qualifying on-the-job injuries, claim qualification under WC means not working and getting utility $V(B)$ from being on a WC claim with cash benefit B , and not paying for any health care treatment. $V(B)$ is a state-dependent utility, increasing in B . Among those individuals not qualifying for a soft-tissue WC claim, the net income received would be " $W - c$ ", with wage W and co-pay c , and utility $U(W-c)$.

Hence, workers with a soft-tissue health condition choose a level of qualification effort g that maximizes their expected utility:

$$(3) \quad \max L(g) \equiv (1 - \pi(g)) * U(W(1 - g) - c) + \pi(g) V(B).$$

The resulting first order condition ($F(g,c,B)=0$) characterizes the equilibrium:

$$(4) \quad F(g,c,B) = -\pi' U(W - c) + -(1 - \pi) U' W' + \pi' V(B).$$

Using the implicit function theory, and assuming that the second order condition for maximization holds, we can show that

$$(5) \quad \frac{\partial g}{\partial B} > 0, \frac{\partial g}{\partial c} > 0.$$

That is, increases in WC benefits, or increases in co-pays under a health insurance program (the alternative to WC reimbursement mechanism for medical care), increases a worker's efforts in getting a soft-tissue condition classified as a WC claim. Increases in efforts to classify a condition as compensable under WC increases the likelihood of a soft-tissue claim being filed. This relationship is the crux of the moral hazard response: WC insurance coverage changes behavior.

The model results above for workers with soft-tissue conditions is static and indicates that claim filing increases as the relative benefits (B) of a claim increases, or the cost of alternative care (c) increases, but this simple illustrative model does not directly show that soft-tissue injuries are more likely to be reported on Monday. The Monday effect hypothesis rises naturally from the model above, coupled with the institutional fact that most workers work Monday through Friday and generally not on the weekend: only 35% of the employed work anytime on the weekends (BLS 2011). Given that weekend activities include household production and recreational activities that may involve risk of soft-tissue injury, it is reasonable to imagine that formal medical care for weekend soft-tissue injuries will more likely be postponed until Monday because health insurance co-pays (under the employer-provided health insurance) are higher than the no co-pay workers' compensation treatments, or an employee feels entitled to no co-pay medical care (due to tenure or union status) giving rise to a "Monday effect." In particular, the model above indicates that incentives to postpone treatment increase in B and c .

If the above-described Monday effect exists, it is a type of claims-reporting moral hazard as discussed by Butler and Worrall (1991), wherein the existence of the insurance changes workers *ex post* reporting behavior with regards to the soft-tissue injuries. If this is the case, the increased Monday reporting would be associated with higher health care deductible payments that raise the cost of using health insurance relative to workers' compensation, or informational advantages such as longer tenure or union membership that facilitate the efficiency of effort (g) spent in claim filing.

Evidence on the Monday Effect

Reported Soft-Tissue Injuries and Insurance Benefits

Dionne and St-Michel (1991) examined increases in WC benefits in Quebec and subsequent WC claim durations by injury type (in a multivariate duration model), and found that the change in the law significantly increased claim duration for hard-to-diagnosis conditions relative to easy-to-diagnosis conditions. We attribute the differential result to more information asymmetry

for the hard-to-diagnosis conditions, and hence, the greater moral hazard reporting response.

Ruser (1998) reached a similar conclusion with a large sample of micro-economic data on lost workday claims from the Bureau of Labor Statistics (BLS). He examined how changes in benefits and waiting periods differentially affected difficult-to-diagnosis conditions relative to other conditions. His multinomial logit analyses indicated an increase in the wage-replacement rate, and a decrease in the benefit-waiting period, increased the fraction of carpal tunnel syndrome cases relative to cuts and fractures, while a decrease in the waiting period increased back sprains relative to fractures, as expected.

Johnson, Baldwin, and Butler (1997) noted that back pain cases in WC claims behave differently from non-back claims. In particular, their multivariate analysis indicated that back pain cases are almost twice as elastic as other accident cases to increases in benefits when it comes to returns to work after an injury—back pain cases are much less likely to return to work given the same benefit increase as lacerations or broken bones. Bolduc, Fortin, Labrecque, and Lanoie (2002) found a similar pattern of increased hard-to-diagnose claim frequency for a sample of construction workers in Quebec, using a random effects multinomial probit model.

The evidence on the effect of higher benefits on the relative frequency of hard-to-diagnose injuries is not unanimous, but tends to support the hypothesis that workers reporting propensities are sensitive to WC benefits—as the model in the last section suggests. In three manufacturing plants, Robertson and Keeve (1983) found that a higher maximum benefit increased the number of subjectively verified injuries and claims such as back sprains and pain, but there was no effect of higher benefits on lacerations and fractures. In contrast, Welland (1986), who studied WC claims data for six states in 1976, found that more generous weekly benefits decreased the proportions of sprains and contusions but increased the proportions of easily diagnosed amputations, burns, fractures, and scratches.

In state-level WC claims data, Butler, Durbin, and Helvacian (1996) found that higher benefits increased the relative frequency of sprains and strains and decreased the frequency of cuts. Anomalously, they also found that the proportion of fractures increased with benefits. Using firm-level data, Butler, Hartwig, and Gardner (1997) also found that sprains and strains increased in frequency with benefit levels, as well as when individual workers' health insurance coverage was under an HMO. The latter finding was attributed to the capitation arrangements of HMOs—wherein, the revenue of the HMO would rise as more soft-tissue claims were classified as work-related, so that the HMO received additional fee-for-services from the WC, on top of the capitation revenue.

Soft-Tissue Injuries on Monday

On the specific issue of a Monday effect, and the timing of soft-tissue claims in WC, studies have found mixed results. Smith (1990) argued that WC

created incentives for workers to report hard-to-diagnose, off-the-job injuries as having occurred on the job. Since more off-the-job hours precede Mondays and the days after long weekends (referred to collectively as “Mondays”) than before regular Tuesdays through Fridays, more off-the-job injuries occur prior to Mondays. Then, hard-to-diagnose injuries will be disproportionately reported on Mondays compared with other regular workdays. Consistent with this hypothesis, Smith showed in WC claims data that a greater proportion of sprains and strains relative to fractures and cuts were reported earlier in the workweek and earlier in the work shift than at other work times.

While subsequent research has found, as Smith did, that relatively more soft-tissue issues occur on Monday than on other days of the week, whether this was due to a moral hazard reporting effect (carrying weekend injuries into work Monday morning) has been disputed. Using Minnesota WC claims data, Card and McCall (1996) showed that workers who were less likely to have health insurance coverage were not more likely to report injuries on Monday compared with other days, as would be expected if employees used WC to provide health insurance for non-work-related injuries. They also showed that the wage-replacement rate did not exert an independent effect on the probability of Monday injuries. Ruser (1998) found that higher benefits increased the reporting of all injuries on Mondays but did not raise the probability of a Monday-reported back sprain relative to a Monday-reported cut or fracture.

Campolieti and Hyatt (2006) used Canada’s universal government-provided medical insurance to identify if the Monday effect was attributable to health coverage differentials by comparing the Monday effect in Canada with the Monday effect in the United States. Since health insurance coverage for soft-tissue injuries is included under the Canadian health plan, regardless of place of occurrence, a larger Monday effect would be expected in the United States than in Canada—if more Monday claims are due to claim migration. Campolieti and Hyatt found quite similar Monday effects in their Ontario sample (Canada) and in their Minnesota sample (United States). They concluded that their results are consistent with an ergonomic explanation of the Monday effect, rather than a moral hazard response.

Empirical Approach

In this article, we examine soft-tissue claims for all employees from a single firm to test Smith’s (1990) moral hazard migration effect (the migration of claims from the weekend to Monday), as well as other sources of moral hazard explanations of the preponderance of soft-tissue injuries on Monday. There are several advantages from examining workers at a single firm.

One advantage is that we have data on all workers—those filing WC claims as well as those who do not. Prior research data have been limited to claims from WC administrative databases, so the analysis is restricted to those who have filed claims, usually only those who have filed lost-time claims (as opposed

to medical-only claims, where they remained on the job). Our data set is more likely to measure the effects we want to measure: How do these variables affect the likelihood of a Monday claim among all workers, not just among those filing WC claims?

Moreover, having information from the human resources data for those same workers allows us to directly estimate correlates of the Monday soft-tissue response with respect to relevant incentive variables, particularly the degree of health insurance coverage, without having to impute health insurance information (Card and McCall 1996; Campolieti and Hyatt 2006) on the basis of socio-demographic information from other data sets, including geographical location. In addition, our sample comes from one large firm with workers in many states, so we get significant variation in the replacement rates for workers of similar socio-demographic backgrounds. Having one firm allows us to control for firm-wide management safety culture and HR policy, which has been found important in determining WC claims and costs in prior studies (Habeck and Hunt 1993; Butler and Park 2005). State health care cost differentials, geographical specific treatment patterns, and variations across states in WC systems will be picked up by state fixed effects.

Finally, as we also have the payroll records and human resource information for individual workers in this firm, matched with their WC experience, the data allow us to control not only for deductibles in the firm's group health insurance (or whether the workers opted out of group health insurance coverage) but also worker tenure, union status, exempt status, married status, as well as the usual socio-demographic information (age, gender, and race).

One Firm's Experience with Soft-Tissue Claims on Monday

The data come from one large company with nationwide operations for the calendar year 2010. The bulk of the workers at this firm had jobs that required rigorous outdoor activity and involved the loading and transportation of materials. Hence, the workforce consists principally of semi-skilled employees. Included are full-time workers (30 hours or more per week) with complete information for all data elements. The restriction to full-time workers makes the sample more homogeneous and ensures that all workers are eligible for health insurance. New workers satisfying these conditions were included in the sample. There were 40,727 workers meeting these restrictions. We considered whether each worker reported a soft-tissue WC injury on any weekday of the year, which served as the dependent variable. As weekend work for this employer is often different from weekday work, we restrict the observations to Mondays through Fridays.

The dependent variable is one if a worker reported a soft-tissue WC injury anytime during the year on a particular day of the workweek (excluding Saturday and Sundays), and zero otherwise. That is, for each individual, five observations are noted for whether a claim was filed for each day of the week: there was a soft-tissue injury claim dummy variable for Monday, a

Table 1. Descriptive Statistics: 2010 Data on Full-Time Workers for a U.S. Employer

<i>Variable</i>	<i>Mean</i>	<i>Standard deviation</i>	<i>Minimum</i>	<i>Maximum</i>
Soft-tissue claim dummy	0.0046	0.06746	0	1.00
Monday	0.2000	0.4000	0	1.00
Age	43.449	10.1176	18.5078	69.982
Tenure	8.9604	8.02433	0.00273	50.381
Female	0.1669	0.3729	0	1.00
Union	0.1983	0.3987	0	1.00
No insurance with employer	0.3910	0.4880	0	1.00
Deductible 600	0.2811	0.44958	0	1.00
Deductible 900	0.09551	0.29398	0	1.00
Workers' compensation benefits	549.7390	155.7088	161.8694	1420.0
Replacement rate	0.6499	0.0708	0.0373	0.670
Black	0.1526	0.3595	0	1.00
Hispanic	0.2074	0.4054	0	1.00
Married	0.6034	0.4891	0	1.00
Exempt	0.16924	0.3749	0	1.00

Notes: $N = 203,635$ weekday/person observations; 40,727 workers.

soft-tissue injury claim dummy variable for Tuesday, and so forth. (Only one person filed two Monday soft-tissue claims during the year; everyone else had zero or one.) Hence, we have 40,727 workers with five observations for each worker, or $40,727 \times 5 = 203,635$ observations. There were 931 soft-tissue (sprains and strains, low-back pain) WC (indemnity or medical only) claims in the sample. For all regressions, we clustered the observations at the worker level.

The descriptive statistics in Table 1 indicate a company with a diversified labor force, roughly mirroring the labor force in the United States but perhaps a bit more blue-collar. The average age is 43, though age ranges from 18 to 70 years old, with a skewed to the right distribution of tenure from 0 to 50 years, with a mean of nine years with the company. The labor force is 21% Hispanic, 15% black, and 17% female. Of this labor force, 20% are unionized; only 17% are exempt. Since the exempt/nonexempt status is a crude measure of occupations, union status may also be measuring some of the occupational differences between workers.

Of these workers, 60% are married. The deductible plans listed are for annual deductibles; the omitted insurance group had a \$300 annual deductible. The average expected benefit for workers, based on each worker's specific weekly wage and the state in which they work, is \$550 per week, with a mean replacement rate of 65%, suggesting a blue-collar labor force for which the weekly maximum benefits were not always binding.

The logistic estimates from the likelihood of filing a soft-tissue claim are presented in Table 2 for logarithmic specifications of benefits (and Table 3 for linear specifications of benefits), with and without state fixed effects (dummy variables for each state), and with and without Monday interactions with key incentive variables. The signs and magnitude of the independent variable coefficients remain relatively stable across the four specifications

(i.e., across fixed effects and interaction pairings), with results consistent with more soft-tissue injuries on Monday, and consistent with incentive effects found in the prior literature. In these tables, the marginal effects of the variables on the likelihood of filing a claim are reported, rather than the change in the log-odds ratios.

In particular, we find—as do prior studies of the Monday effect—that soft-tissue claims increase by roughly 21% relative to other weekdays, and that this increase is statistically significant. Moreover, we find that union members are more likely to file soft-tissue claims. The positive union effect is consistent with Butler and Worrall's (1983) analysis of U.S. trends in earlier WC claim rates, but not consistent with the negative effect that unions had on soft-tissue claims as estimated in more recent data analyzed by Butler, Durbin, and Helvacian (1996). Other estimates found that unionized workers filed more claims (Hirsch, Macpherson, and DuMond 1997).

Job-specific tenure estimates lower the likelihood of filing a soft-tissue claim for all specifications in Tables 2 and 3, consistent with the trends found in the prospective low-back study of Baldwin, Butler, Johnson, and Cote (2007). Age increases the likelihood of a soft-tissue injury, as might be expected given the natural decline of the musculoskeletal system, though the effect is never statistically significant.

Finally, we find *ex ante* incentive responses to WC benefits similar to most of the prior literature (for a thorough review of such incentives, see Ruser and Butler 2010), in that higher WC benefits increase the likelihood of filing a soft-tissue claim. To capture workers' incentives, we re-parameterized the potential impact of $\ln(\text{wages})$ and $\ln(\text{benefits})$ of each worker on claim filing (as right-hand-side predictor variables) as

$$(6) \quad \lambda \ln(\text{benefits}) - \alpha \ln(\text{wages}) = \alpha \ln\left(\frac{\text{benefits}}{\text{wages}}\right) + (\gamma - \alpha) \ln(\text{benefits})$$

so that the coefficient on the replacement rate represents the common magnitude of the effect of wages and benefits on claim filing ($\alpha > 0$, $\gamma > 0$), with the coefficient on benefits measuring the differential impact benefits have on claim filing over wages (so $\gamma > \alpha$ if the effect is asymmetric, with potential benefits influencing the claims filing more than wages). For the state fixed-effects specification, either with logs or in linear form for wages and benefits, we find that the replacement rate increases claim filing, but that the effect is not symmetrical: benefits increase claims filing even more than wages decrease claims filing. (Results for other specifications of the wage and benefit effects are given in the Appendix to this paper.)

But while our estimates of the determinants (benefits, unionization, and experience) of soft-tissue claims are typical of the literature, the Monday effect hinges on whether these factors differentially affect a claim being filed on Monday, and in particular, whether variation in the health insurance coverage of the employee affects claim filing. The statistically significant Monday coefficient of roughly .001 indicates more soft-tissue claims are filed on Monday, but if these claims were due to a moral hazard migration, then the interaction

Table 2. WC Soft-Tissue Indemnity Claim (Medical or Indemnity), Logarithmic Specifications

Variable	No interactions, no state FE		Interactions, ^a no state FE		No interactions, state FE		Interactions, ^a state FE	
	Parameters	Prob. sign.	Parameters	Prob. sign.	Parameters	Prob. sign.	Parameters	Prob. sign.
Intercept	-0.03590	<.0001	-0.03489	<.0001	-0.04008	<.0001	-0.03901	<.0001
Monday	0.00094	0.0070	0.00100	0.0331	0.00094	0.0070	0.00103	0.0291
Age	0.00000	0.6209	0.00000	0.6216	0.00000	0.6682	0.00000	0.6686
Tenure	-0.00014	<.0001	-0.00014	<.0001	-0.00014	<.0001	-0.00014	<.0001
Female	-0.00172	0.0015	-0.00172	0.0015	-0.00152	0.0055	-0.00152	0.0055
Union	0.00307	<.0001	0.00283	<.0001	0.00306	<.0001	0.00282	<.0001
no_ins_with_employer	-0.00056	0.1800	-0.00059	0.2006	-0.00069	0.1264	-0.00071	0.1460
ded600	-0.00032	0.4502	-0.00032	0.4502	-0.00034	0.4307	-0.00034	0.4308
ded900	-0.00112	0.0887	-0.00112	0.0887	-0.00111	0.0935	-0.00111	0.0936
ln(WC benefits)	0.00229	0.0020	0.00220	0.0091	0.00319	<.0001	0.00311	0.0005
ln(replacement rate)	0.00421	0.1870	0.00520	0.1592	0.00632	0.0642	0.00757	0.0273
Black	0.00105	0.0071	0.00105	0.0069	0.00123	0.0035	0.00123	0.0035
Hispanic	-0.00014	0.7188	-0.00014	0.7188	-0.00016	0.7211	-0.00015	0.7221
Married	-0.00030	0.3391	-0.00030	0.3391	-0.00036	0.2477	-0.00036	0.2475
Exempt	-0.00813	<.0001	-0.00841	<.0001	-0.00798	<.0001	-0.00826	<.0001
Monday*ln(wc_ben)_dev			0.00037	0.8229			0.00035	0.8330
Monday*ln(tr)_dev			-0.00326	0.6440			-0.00401	0.5833
Monday*tenure_dev			-0.00002	0.7048			-0.00002	0.7097
Monday*union_dev			0.00099	0.2317			0.00101	0.2404
Monday*no_ins_dev			0.00011	0.8898			0.00008	0.9214
Monday*exempt_dev			0.00113	0.6816			0.00114	0.6645
QIC (model fit)	11548.8838		11558.8910		11507.9131		11517.8769	
Prob. sign. interactions	—		0.8362		—		0.8361	
Prob. sign. state FE	—		—		<.0001		<.0001	

Notes: Logistic estimates with marginal effects reported (dF(y=1)/dX). Standard errors clustered at the individual worker level.

^a = All interaction terms have been deviated from their mean, so that the mean values equal zero for these variables.

Table 3. WC Soft-Tissue Indemnity Claim (Medical or Indemnity), Linear Specifications

Variable	No interactions, no state FE		Interactions, ^a no state FE		No interactions, state FE		Interactions, ^a state FE	
	Parameters	Prob. sign.	Parameters	Prob. sign.	Parameters	Prob. sign.	Parameters	Prob. sign.
Intercept	-0.03081	<.0001	-0.03158	<.0001	-0.03417	<.0001	-0.03515	<.0001
Monday	0.00094	0.0070	0.00099	0.0367	0.00094	0.0070	0.00101	0.0332
Age	0.00000	0.6232	0.00000	0.6239	0.00000	0.6703	0.00000	0.6708
Tenure	-0.00014	<.0001	-0.00014	<.0001	-0.00014	<.0001	-0.00014	<.0001
Female	-0.00173	0.0014	-0.00173	0.0014	-0.00154	0.0047	-0.00154	0.0047
Union	0.00304	<.0001	0.00280	<.0001	0.00303	<.0001	0.00278	<.0001
no_ins_with_employer	-0.00058	0.1638	-0.00061	0.1862	-0.00072	0.1085	-0.00074	0.1287
ded600	-0.00032	0.4526	-0.00032	0.4526	-0.00034	0.4325	-0.00034	0.4325
ded900	-0.00112	0.0876	-0.00112	0.0877	-0.00111	0.0911	-0.00111	0.0912
Workers' comp benefits	0.00000	0.0006	0.00000	0.0035	0.00000	<.0001	0.00000	0.0001
Replacement rate	0.00751	0.2448	0.00886	0.2300	0.01196	0.0651	0.01359	0.0391
Black	0.00105	0.0069	0.00105	0.0068	0.00125	0.0031	0.00125	0.0031
Hispanic	-0.00013	0.7339	-0.00013	0.7339	-0.00013	0.7691	-0.00013	0.7696
Married	-0.00029	0.3469	-0.00029	0.3468	-0.00035	0.2557	-0.00035	0.2555
Exempt	-0.00847	<.0001	-0.00879	<.0001	-0.00835	<.0001	-0.00868	<.0001
Monday*wc_ben_dev			0.00000	0.8824			0.00000	0.8968
Monday*rr_dev			-0.00479	0.7507			-0.00567	0.6984
Monday*tenure_dev			-0.00002	0.7154			-0.00002	0.7202
Monday*union_dev			0.00101	0.2244			0.00103	0.2321
Monday*no_ins_with_employer_dev			0.00010	0.8972			0.00007	0.9300
Monday*exempt_dev			0.00126	0.6712			0.00128	0.6444
QJC (model fit)	11547.9833		11558.3795		11506.2469		11516.4656	
Prob. sign. interactions	—		0.8456		—		0.8454	
Prob. sign. state FE	—		—		<.0001		<.0001	

Notes: Logistic Estimates with marginal effects reported (dF(y=1)/dX). Standard errors clustered at the individual worker level.
^a = All interaction terms have been deviated from their mean, so that the mean values equal zero for these variables.

of the Monday effects with “incentive to migrate a claim to Monday” variables (like health insurance coverage) should be statistically significant.

None of the Monday interactions are statistically significant, however, either individually or jointly (as the probability significance levels near the bottom of the table indicate, with values of about .84 in all specifications with the interactions). As noted in the footnotes to Tables 2 and 3, in the “Monday*X” interactions we have deviated the X variables from their mean in order to readily interpret the Monday main effect. This deviation, however, does not affect the sign or significance of any of the interactions (nor of the significance of their joint effect). That is, unionization leads to more claims being filed, but not additional filings by union members on Monday. Exempt (as a crude measure of occupation) workers file fewer soft-tissue claims generally, but not differentially so on Monday. Higher relative benefits lead to a significantly higher rate of claims, but benefits affect filings on all weekdays equally. Most significantly, no evidence supports the assertion that those without health insurance tend to file more claims on Monday than any other day of the week. Indeed, in our data, differences in health insurance coverage have no effect on claims filing whatsoever. These results are robust whether we enter benefits and wages in either logarithmic (Table 2) or linear form (Table 3). We find no evidence of moral hazard response. (Ordinary least squares [OLS] regressions exhibited the same pattern of results and are available on request.)

Robustness Checks

The finding that health insurance parameters (including no differential response on the part of uninsured employees) have no impact on differential Monday filings runs counter to Smith’s (1990) hypothesized mechanism for the moral hazard migration of claims from a weekend softball injury to a Monday work-related claim, a migration that should be affected by the type of health insurance coverage. One problem with the interpretation of uninsured status in Tables 2 and 3 is that workers not insured with this employer may be covered under the policy of a spouse.

Hence, in Table 4 we restrict our sample to the subset of individuals whose health insurance was provided through this employer. Under this restriction, 24,802 workers were included in the sample with a total number of observations of 124,010 (5*24,802). With this subset of workers, the levels of deductibles have a quantitatively small and statistically insignificant effect, both with respect to the main effects and to the interactions with a Monday dummy. (In the models with Monday interactions, the Monday effect and Monday interaction with the replacement rate are highly collinear and were dropped from the analysis shown in Table 5. Its exclusion had no impact on the health care deductible variables.) This confirms the earlier results in Tables 2 and 3: Even when we restrict the regression sample to those having employer-provided insurance, no evidence supports that the levels of deductibles in those policies have any impact on the likelihood of filing more soft-tissue claims on Monday, or for that matter, any other day of the week.

Table 4. Likelihood of a WC Soft-Tissue Indemnity Claim (Medical or Indemnity)

Variable	No interactions, no state FE		Interactions, ^a no state FE		No interactions, state FE		Interactions, ^a state FE	
	Parameters	Prob. sign.	Parameters	Prob. sign.	Parameters	Prob. sign.	Parameters	Prob. sign.
Intercept	-0.02591	<.0001	-0.03032	<.0001	-0.02751	<.0001	-0.03193	<.0001
Monday	0.00064	0.1370	0.00113	0.0568	0.00064	0.1370	0.00112	0.0564
Age	0.00002	0.1617	0.00002	0.1627	0.00002	0.1922	0.00002	0.1930
Tenure	-0.00015	<.0001	-0.00015	<.0001	-0.00015	<.0001	-0.00016	<.0001
Female	-0.00206	0.0012	-0.00205	0.0012	-0.00190	0.0033	-0.00189	0.0033
Union	0.00304	<.0001	0.00273	<.0001	0.00316	<.0001	0.00284	0.0001
ded600	-0.00029	0.4590	-0.00048	0.2772	-0.00023	0.5452	-0.00043	0.3315
ded900	-0.00099	0.0959	-0.00093	0.1636	-0.00089	0.1343	-0.00084	0.2125
ln(WC benefits)	0.00084	0.3348	0.00162	0.1060	0.00126	0.1765	0.00205	0.0529
ln(replacement rate)	0.00267	0.4354	0.00325	0.4332	0.00352	0.3145	0.00424	0.2400
Black	0.00100	0.0235	0.00100	0.0233	0.00099	0.0461	0.00099	0.0455
Hispanic	-0.00001	0.9841	-0.00001	0.9743	0.00021	0.6994	0.00021	0.7030
Married	-0.00007	0.8438	-0.00007	0.8472	-0.00015	0.6973	-0.00015	0.6992
Exempt	-0.00808	<.0001	-0.00929	<.0001	-0.00789	<.0001	-0.00908	<.0001
Monday*ln(wc_ben)			-0.00329	0.0745			-0.00331	0.0749
Monday*ln(rr)			-0.00170	0.8122			-0.00202	0.7748
Monday*tenure			0.00002	0.7719			0.00002	0.7829
Monday*union			0.00131	0.2441			0.00136	0.2279
Monday*exempt			0.00435	0.1632			0.00431	0.1520
Monday*ded600			0.00085	0.3571			0.00085	0.3544
Monday*ded900			-0.00025	0.8599			-0.00025	0.8604
QIC (model fit)	6401.0811		6409.0205		6398.3722		6406.1224	
Prob. sign. interactions	—		0.5953		—		0.5953	
Prob. sign. state FE	—		—		<.0001		<.0001	

Notes: Logistic estimates; with marginal effects reported (dF(y=1)/dX); sample restricted to those with health insurance through the employer. Standard errors clustered at the individual worker level.

^a = All interaction terms have been deviated from their mean, so that the mean values equal zero for these variables.

Table 5. WC Fracture or Laceration Claim (Medical or Indemnity)

Variable	No interactions, no state FE		Interactions, ^a no state FE		No interactions, state FE		Interactions, ^a state FE	
	Parameters	Prob. sign.	Parameters	Prob. sign.	Parameters	Prob. sign.	Parameters	Prob. sign.
Intercept	-0.01260	0.0012	-0.01442	0.0008	-0.01281	0.0014	-0.01471	0.0010
Monday	-0.00038	0.2208	-0.00110	0.0562	-0.00038	0.2208	-0.00118	0.0617
Age	-0.00002	0.0915	-0.00002	0.0904	-0.00002	0.0838	-0.00002	0.0831
Tenure	-0.00006	0.0014	-0.00007	0.0005	-0.00007	0.0009	-0.00008	0.0003
Female	-0.00438	<.0001	-0.00438	<.0001	-0.00421	<.0001	-0.00422	<.0001
Union	0.00097	0.0007	0.00087	0.0062	0.00117	0.0008	0.00107	0.0054
no_ins_with_employer	-0.00049	0.1039	-0.00052	0.1103	-0.00063	0.0519	-0.00067	0.0588
ded600	-0.00023	0.4732	-0.00023	0.4736	-0.00024	0.4546	-0.00024	0.4545
ded900	0.00001	0.9716	0.00001	0.9715	0.00002	0.9609	0.00002	0.9605
ln(WC benefits)	0.00050	0.4063	0.00079	0.2449	0.00062	0.3308	0.00091	0.1986
ln(replacement rate)	0.00359	0.1613	0.00321	0.2224	0.00465	0.0517	0.00428	0.0784
Black	-0.00112	0.0041	-0.00112	0.0042	-0.00115	0.0060	-0.00115	0.0061
Hispanic	-0.00050	0.0964	-0.00050	0.0950	-0.00038	0.2722	-0.00038	0.2723
Married	0.00004	0.8533	0.00004	0.8528	0.00003	0.9050	0.00003	0.9056
Exempt	-0.00463	<.0001	-0.00448	<.0001	-0.00450	<.0001	-0.00434	<.0001
Monday*ln(wc_ben)_dev			-0.00161	0.2891			-0.00162	0.2850
Monday*ln(rr)_dev			0.00560	0.5444			0.00717	0.4912
Monday*tenure_dev			0.00005	0.2678			0.00005	0.2681
Monday*union_dev			0.00052	0.4546			0.00053	0.4556
Monday*no_ins_with_employer_dev			0.00017	0.7773			0.00016	0.7895
Monday*exempt_dev			-0.00213	0.4214			-0.00213	0.4085
QJC (model fit)	13972.3840		13987.4480		14086.5245		14101.6679	
Prob. sign. interactions	—		0.3634		—		0.3634	
Prob. sign. state FE	—		—		0.0078		0.0079	

Notes: Logistic Estimates with marginal effects reported (dF(y=1)/dX). Standard errors clustered at the individual worker level.

^a = All interaction terms have been deviated from their mean, so that the mean values equal zero for these variables.

Do Ergonomics Explain the Monday Effect?

If WC soft-tissue claims on Monday are not a substitute for health insurance, nor the result of differential information or influence due to union status or tenure, why the higher frequency on Mondays? One explanation for the Monday effect, not associated with incentive responses or overlapping benefits from other programs, is the ergonomic explanation that people come into work “cold,” without limbering up, which makes them much more susceptible to workplace injuries, especially in the first few hours of a work shift and especially at the beginning of a workweek (Hess and Hecker 2003). This vulnerability could explain why more soft-tissue injuries occur on Monday and why more occur at the beginning of a shift than at other times during a work shift (Choi, Levitsky, Lloyd, and Stones 1996). To test the hypothesis that the Monday effect really is an ergonomic problem, we reproduce the results from Table 2 on soft-tissue claims in Table 5 for the likelihood of a fracture or laceration.

As lacerations and fractures are readily observed and—because of their serious nature—more likely to be treated immediately, they present a useful contrast with strains and sprains and other soft-tissue claims. In Table 5, the socio-demographic factors such as gender, work status (exempt, union, tenure), and race exhibit the same associations for fractures as they do for sprains: Union workers and males file more claims, perhaps reflecting the risk of their work, while exempt workers and more experienced workers exhibit fewer claims.

Nonetheless, there are actually fewer lacerations and fractures filed on Mondays (rather than more as for sprains and strains), though the negative Monday response is small and statistically insignificant. If muscle soreness or impaired muscle response were the only issues, then soft tissue and lacerations should both be higher on Mondays if physical “warming-up” was the only thing that was important. (Although the evidence of subsequent muscle responsiveness to warming up is mixed, there continues to be an upward trend in encouraging warm-up exercises at work, see Hess and Hecker 2003.) Mondays may also be riskier than other days if “cognition” (environmental awareness) needs to be warmed-up at the first of the week. This could be the case if a lack of sleep on Sunday night diminished cognitive capacity on Mondays, as evidence suggests. Barnes and Wagner (2009) found that the change to daylight saving time diminished sleep for workers and increased accidents for miners on Mondays following the change. So, if lack of warming up drove Monday claims because either muscle response was relatively impaired, or lack of sleep decreased cognitive abilities, then—for either margin of ergonomic response—Monday claims should rise both for soft-tissue claims and for lacerations and fractures. But this is not the case for lacerations and fractures.

Moreover, the workweek distribution of workplace fatalities, given nationwide in Table 6 for the most recently available vital statistics data (information from all U.S. death certificates is available at the U.S. Census Bureau DataFerrett website <http://dataferrett.census.gov>), indicates no more fatalities

Table 6. Distribution of Fatal Injuries by Day of the Week

Day	1993		1994		1995		1996		1997		1998	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Mon	700	16.1	695	15.7	721	16.6	697	16.1	642	15.2	604	14.9
Tue	695	16.0	754	17.1	659	15.2	666	15.4	712	16.9	699	17.2
Wed	742	17.1	742	16.8	755	17.4	751	17.3	687	16.3	713	17.5
Thur	721	16.6	705	15.9	716	16.5	734	16.9	712	16.9	653	16.1
Fri	654	15.0	721	16.3	712	16.4	638	14.7	679	16.1	671	16.5
Sat	654	15.0	721	16.3	712	16.4	638	14.7	679	16.1	671	16.5
Sun	369	8.5	357	8.1	335	7.7	369	8.5	329	7.8	299	7.4

Notes: For males, age 25 to 65 years old at death, with occupational injuries resulting in death by day of the week. Authors' calculations from mortality data, <http://dataferrett.census.gov>, 1993–1998. Chi-square tests of independence of fatalities by day of the workweek (excluding Saturdays and Sundays) for each year separately cannot be rejected at the 10% level for the years 1993–1995, 1997. Fatalities differ significantly by the workday of the week only for 1996 (when Wednesday and Thursday have high values), and for 1998 (when Tuesday and Wednesday have high values, and Monday has the lowest value for fatalities). In the aggregate from 1993 to 1998, there have been the fewest fatalities on Monday (19.37%) followed by Friday (19.45%), and the most fatalities on Wednesday (20.95%) and Thursday (20.24%), which differences are not practically important but are statistically significant at less than the 1% level.

on Monday than on other weekdays. Indeed, over the sample period for which these data are available, there are actually fewer fatalities on Monday than on any other day of the workweek (Tuesday through Friday).

This finding suggests that if there is something unique about worker's *reported* injury risk early in the shift and early in the week, it seems to manifest itself in complaints about strains and sprains, rather than being more widely associated with a fuller range of injuries that would include fractures and lacerations, and more serious workplace risk factors, including workplace mortality.

Conclusions: Asymmetric Work Aversion?

Monday claims in WC, relative to claims filed on other days of the week, has been frequently employed as an instrumental variable to identify incentive responses in WC. This response has been linked to many factors, as alluded to above (see also Butler, Gardner, and Kleinman 2014): health insurance coverage, union status, benefits generosity, and so forth, generally, as well as explanations linked to economic or ergonomic factors. That these factors are empirically unimportant is significant given the many arguments and popular anecdotes to the contrary. If more Monday filings are not economic or ergonomic, maybe they represent workers' greater reluctance to return to work (after a weekend away) than their reluctance to continue to work once launched into the workweek. Under this hypothesis, workers need not have more traumatic events on Monday that lead to a sprain or a strain, but instead, in the presence of "dissatisfaction" with Monday work, they are more likely to notice their strains, sprains, or headaches. We know that workers who experience job dissatisfaction have worse low-back-pain

outcomes (Johnson and Butler 2011), and that those who argue more with their supervisors or customers are more likely to subsequently report a WC claim (Gardner and Butler 1996).

In general, it seems to be well established that psychosocial states, including stress, affect an individual's health at work, including physiological changes affecting musculoskeletal pain (Moon and Sauter 1996; Lundberg 1999; Sprigg et al. 2007). We think that the Monday effect may well be explained by job stress, if a reasonable number of workers find that returning to work on Monday (after a weekend away) is more stressful than continuing work during the rest of the week. This is consistent with the finding of Schlotz, Hellhammer, Schulz, and Stone (2004) that cortisol awakening response had a steeper gradient (per minutes after awakening) and a higher level after 45 minutes awake on Monday than for any other day of the week as a measure of anticipated stress (Wednesday is the next highest per Schlotz et al. 2004, Figure 1). The authors found weekend cortisol responses to be much lower than any weekday.

We have indirect evidence on asymmetric work aversion as well. If it is really work aversion (poor job matches, unpleasant supervisors, lack of autonomy, and so forth), and not workers' compensation per se that yields a Monday effect, we would expect the following: 1) more musculoskeletal health claims reported on Monday (not just workers' compensation claims); and 2) more work absences on Monday (and particularly, more on Monday than on Friday—to differentiate our work aversion explanation from workers simply trying to lengthen the weekend with an absence, which would work for either a Monday or a Friday).

When we examine the primary ICD9 codes of 840–848 (sprains and strains) in a large proprietary database of employee medical claims, we found the following numbers of claims:

Table 7. Medical Insurance Claims for Sprains and Strains by Day of the Week

<i>Day</i>	<i>Number</i>
Sunday	35,964
Monday	353,697
Tuesday	285,125
Wednesday	338,338
Thursday	275,903
Friday	320,730
Saturday	82,131

Notes: From the HCMS Research Reference Database: a de-identified, integrated information system on more than 1,900,000 employees and their dependents from more than 30 large employers throughout the United States. The database represents various industries including communications, transportation, finance, health care, retail, and others. The database contains employee-specific information from human resource records, payroll, health insurance claims, and work absence.

So, more sprains and strains are filed by workers generally under their health care insurance on Monday relative to other days of the workweek, although the difference is not nearly as large as the WC differential estimated above. Moreover, the second highest levels of claims are for Wednesday, consistent with the Schlotz et al. (2004) elevated cortisol awakening patterns. Again, like the evidence for lacerations and broken bones, soft-tissue WC claims seem to represent something other than an ergonomic problem.

Using again the proprietary data for several companies that tracked the day of the week the sick leave was taken, the distribution of total sick-leave hours taken by day of the week are as follows:

Table 8. Sick Leave Hours by Day of the Week

<i>Day</i>	<i>Number</i>
Sunday	93,845
Monday	2,596,660
Tuesday	2,195,641
Wednesday	1,998,279
Thursday	1,961,727
Friday	2,064,126
Saturday	327,246

Note: See footnotes for Table 7.

Note how similar sick hours are for Tuesday through Friday and how remarkably higher the sick hours are for Monday. The difference in work absence is even more than the 20% differential on soft-tissue filings. We interpret this as a manifestation of asymmetric work aversion—people are more reluctant to come to work on Mondays than they are to continue to work the rest of the week. Note further that the Friday sick leaves are not elevated relative to Tuesday through Thursday levels, but Friday is considerably lower than Mondays.

The observed Monday response seems to be especially linked to strains and sprains as indicated above, but not to other types of WC claims. For example, if job satisfaction affected other types of injures, and if we could proxy job satisfaction with marital status and 3-digit occupational codes (as suggested by Lacy, Hougland, and Shepherd 1982), then these should affect the relative number of fatalities on Monday. (Occupations with higher pay and more autonomy ought to exhibit fewer fatalities on Monday.) However, neither occupational status nor marital status, holding other socio-demographic variables constant, have any effect on the likelihood of a Monday fatality (the results are available on request).

In summary, more WC claims for soft-tissue injuries are filed on Monday, and earlier in the shift on Monday, than during any other period of the week. Explanations for this pattern include 1) “warm-up” or ergonomic

effects (Choi et al. 1996) or 2) false classification of off-the-job weekend athletic injuries (facilitated by lack of health insurance, replacement rates, or union status). We examined more than 200,000 employment “days” for a single, large national employer, operating across the United States, with uniform human resource policies and for which we have information on the workers’ health insurance policies, as well as their work status (exempt, union, and tenure). Although we find more soft-tissue claims filed for younger workers, union members, workers with higher expected WC benefits, and workers in nonexempt occupations, we do *not* find that these factors—nor the absence of health insurance or the existence of higher deductibles in their extant health insurance policies—differentially increase soft-tissue filings on Monday. We cannot reject the null hypothesis that the Monday effect is neither ergonomic nor economic, but rather a manifestation of asymmetric work aversion: going back to work is harder than being at work.

As it appears that the Monday effect is an asymmetric work-aversion response, our results suggest that employers in industries with higher rates of Monday absences do something on Monday morning that the employees will look forward to: for example, free donuts and coffee, or a modest continental breakfast, or weekly drawings for small prizes held on Monday morning. It may well be that making the workplace more attractive on Monday is much more cost-effective than paying for the additional soft-tissue claims or losing important firm-specific capital on Monday mornings.

Appendix

Table A.1. Alternative Specifications of the Wage and Benefit Effects

Table	Model	With state variables?	Coefficient of wc_ben or $\ln(wc_ben)$	VIF of wc_ben or $\ln(wc_ben)$
3	WeeklyWage/1000	Yes	.0034	2.97
3	Wage/1000, +squared	Yes	.0028	3.89
3	Wage/1000, +squared, +cubed	Yes	Perfect collinearity	5.95
3	Wage/1000, +squared, +cubed, +4th	Yes	Perfect collinearity	8.98
3	Wage/1000	No	.0027	2.58
3	Wage/1000, +squared	No	.0018	3.36
3	Wage/1000, +squared, +cubed	No	Perfect collinearity	5.03
3	Wage/1000, +squared, +cubed, +4th	No	Perfect collinearity	7.28
2	Ln(weeklywage)	Yes	2.0998	7.24
2	Ln(weeklywage), +squared	Yes	2.6077	20.22
2	Ln(weeklywage), +squared, +cubed	Yes	1.0088	20.28
2	Ln(weeklywage), +squared, +cubed, +4th	Yes	.7448	23.65
2	Ln(weeklywage)	No	1.4352	6.22
2	Ln(weeklywage), +squared	No	1.7064	14.83
2	Ln(weeklywage), +squared, +cubed	No	.4166	14.88
2	Ln(weeklywage), +squared, +cubed, +4th	No	.2129	16.72

Notes: Wages and benefits entered into the specification separately, without the ratio term; VIF = variance inflation factor, a measure of collinearity. Bronchetti and McInerney (2012) reported that the estimated benefit elasticity falls as you include more wage terms (allow for nonlinear wage effects) in their models. Like Bronchetti and McInerney (2012), we find for our models that the estimated benefit elasticity generally fails as you allow for more nonlinearity in the wage effect, as the VIF increases sharply. Full specification results are available on request.

References

- Baldwin, Marjorie L., Richard J. Butler, William G. Johnson, and Pierre Côté. 2007. Self-reported severity measures as predictors of return-to-work outcomes in occupational back pain. *Journal of Occupational Rehabilitation* 17(4): 683–700.
- Barnes, Christopher M., and David T. Wagner. 2009. Changing to daylight saving time cuts into sleep and increases workplace injuries. *Journal of Applied Psychology* 94(5): 1305–17.
- Bolduc, Denis, Bernard Fortin, France Labrecque, and Paul Lanoie. 2002. Workers' compensation, moral hazard, and the composition of workplace injuries. *Journal of Human Resources* 37(3): 623–52.
- Bronchetti, Erin Todd, and Melissa McInerney. 2012. Revisiting incentive effects in workers' compensation: Do higher benefits really induce more claims? *Industrial and Labor Relations Review* 65(2): 288–315.
- [BLS] Bureau of Labor Statistics. 2011. Time use survey, 2009 data. Accessed at <http://www.bls.gov/tus/charts/chart11.pdf> (July 2010). Washington, DC: U.S. Department of Labor.
- Butler, Richard J., and Yong-Seung Park. 2005. *Safety Practices, Firm Culture, and Workplace Injuries*. Kalamazoo, MI: Upjohn Institute for Employment Research.
- Butler, Richard J., and John D. Worrall. 1983. Workers' compensation: Benefit and injury claims rates in the seventies. *Review of Economics and Statistics* 65(4): 580–89.
- . 1991. Claims reporting and risk bearing moral hazard in WC. *Journal of Risk and Insurance* 58(2): 191–204.
- Butler, Richard J., David L. Durbin, and N. Michael Helvacian. 1996. Increasing claims for soft tissue injuries in workers' compensation: cost shifting and moral hazard. *Journal of Risk and Uncertainty* 13: 73–87.

- Butler, Richard J., Harold H. Gardner, and Nathan L. Kleinman. 2014. Workers' compensation: Occupational injury insurance's influence on the workplace. In Georges Dionne (Ed.), *Handbook of Insurance*, 2nd edition, pp. 449–70. New York: Springer Books.
- Butler, Richard J., Robert Hartwig, and Harold H. Gardner. 1997. HMOs, moral hazard and cost shifting in WC. *Journal of Health Economics* 16(2): 191–206.
- Campolieti, Michael, and Douglas E. Hyatt. 2006. Further evidence on the “Monday effect” in workers' compensation. *Industrial and Labor Relations Review* 59(3): 438–50.
- Card, David, and Brian P. McCall. 1996. Is workers' compensation covering uninsured medical cost? Evidence from the “Monday effect.” *Industrial and Labor Relations Review* 49(4): 690–706.
- Choi, Bernard, Marianne Levitsky, Roxanne Lloyd, Ilene M. Stones. 1996. Patterns and risk factors for sprains and strains in Ontario, Canada, 1990: An analysis of the workplace health and safety agency data base. *Journal of Occupational & Environmental Medicine* 38(4): 379–89.
- Dionne, Georges, and Pierre St-Michel. 1991. WC and moral hazard. *Review of Economics and Statistics* 73(2): 236–44.
- Gardner, Harold H., and Richard J. Butler. 1996. A human capital perspective for cumulative trauma disorders: Moral hazard effects in disability compensation programs. In Sam D. Moon and Steven L. Sauter (Eds.), *Psychological Aspects of Musculoskeletal Disorders in Office Work*, pp. 231–50. London: Taylor and Francis.
- Habeck, Rochelle V., and H. Allan Hunt. 1993. *Michigan Disability Prevention Study*. Michigan Department of Labor: W. E. UpJohn Institute for Employment Research.
- Hess, Jennifer A., and Steve Hecker. 2003. Stretching at work for injury prevention: Issues, evidence, and recommendations. *Applied Occupational and Environmental Hygiene* 18(5): 331–38.
- Hirsch, Barry T., David A. Macpherson, and J. Michael DuMond. 1997. Workers' compensation reciprocity in union and nonunion workplaces. *Industrial and Labor Relations Review* 50(2): 213–36.
- Johnson, William G., and Richard J. Butler. 2011. Loss reduction through worker satisfaction: The case of workers' compensation. *Risk Management and Insurance Review* 14(1): 1–26.
- Johnson, William G., Marjorie L. Baldwin, and Richard J. Butler. 1997. Back pain and work disability: The need for a new paradigm. *Industrial Relations* 37(1): 9–34.
- Lacy, William B., James G. Hougland Jr, and Jon J. Shephard. 1982. Relationship between work and nonwork satisfaction: Is it changing and does occupational prestige make a difference? *Sociological Spectrum* 2(2): 157–71.
- Lundberg, Ulf. 1999. Stress responses in low-status jobs and their relationship to health risks: Musculoskeletal disorders. *Annals of the New York Academy of Sciences* 896: 162–72.
- Moon, Sam D., and Steven L. Sauter (Eds.). 1996. *Psychological Aspects of Musculoskeletal Disorders in Office Work*. London: Taylor and Francis.
- Robertson, Leon S., and J. Philip Keeve. 1983. Worker injuries: The effects of workers' compensation and OSHA inspections. *Journal of Health Politics, Policy and Law* 8(3): 581–97.
- Ruser, John W. 1998. Does WC encourage hard to diagnose injuries? *Journal of Risk and Insurance* 65(1): 101–24.
- Ruser, John W., and Richard J. Butler. 2010. The economics of occupational safety and health. *Foundations and Trends in Microeconomics* 5(5): 301–54.
- Schlotz, Wolff, Juliane Hellhammer, Peter Schulz, and Arthur Stone. 2004. Perceived work overload and chronic worrying predict weekend–weekday differences in the cortisol awakening response. *Psychosomatic Medicine* 66(2): 207–21.
- Sengupta, Ishita, Virginia Reno, and John F. Burton Jr. 2011. *Workers Compensation: Benefits, Coverage, Costs 2009*. Washington, DC: National Academy of Social Insurance.
- Smith, Robert S. 1990. Mostly on Mondays: Is workers' compensation covering off-the-job injuries? In Philip S. Borba and David Appel (Eds.), *Benefits, Costs, and Cycles in Workers' Compensation*, pp. 115–27. Boston: Kluwer Academic Publishers.
- Sprigg, Christine A., Christopher B. Stride, Toby D. Wall, David J. Holman, and Phoebe R. Smith. 2007. Work characteristics, musculoskeletal disorders, and the mediating role of psychological strain: A study of call center employees. *Journal of Applied Psychology* 92(5): 1456–66.
- Welland, David A. 1986. Workers' compensation liability changes and the distribution of injury claims. *Journal of Risk and Insurance* 53(4): 662–78.

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