

INSURANCE FRAUD AND THE MONDAY EFFECT IN WORKERS COMPENSATION INSURANCE

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Résumé de l'article

La fraude à l'assurance a fait, depuis une quinzaine d'années, l'objet d'une surveillance grandissante par les gestionnaires de risques, les gestionnaires de sinistres au sein des compagnies d'assurance, les assureurs publics et les chercheurs universitaires. L'assurance des accidents de travail a toujours attiré les réclamations frauduleuses d'employés inventant des histoires d'accidents sur les lieux du travail, particulièrement les réclamations difficiles à vérifier, comme celles reliées aux douleurs musculaires et aux maux de dos. En plus de gérer la véracité des réclamations individuelles, les gestionnaires de risques doivent répondre au besoin de concevoir des modèles liés aux mesures de sécurité en cas de blessures, lorsque telles réclamations sont faites légitimement. Il peut être parfois ardu de faire la distinction entre les réclamations fondées et celles qui sont frauduleuses. L'objectif de cet article est d'observer un type particulier de réclamations, celles qui sont présentées le premier jour de la semaine.

L'auteur tente de tester l'hypothèse de fraude en utilisant directement les données disponibles du Massachusetts Insurance Fraud Bureau en les comparant à l'ensemble des réclamations des accidents de travail étalées entre les années 1990 et 1995. Les résultats ne démontrent aucune différence dans la distribution journalière des fraudes et celles de l'ensemble des réclamations au travail, prêtant un support additionnel aux réclamations plus élevées les lundis pour des blessures sévères, plutôt que pour des réclamations frauduleuses. Un tel résultat dirige tous les gestionnaires de risques vers l'importance de concevoir des mesures de contrôle des pertes sur l'effet du lundi dans le cadre de leurs opérations.

INSURANCE FRAUD AND THE MONDAY EFFECT IN WORKERS COMPENSATION INSURANCE

by Richard A. Derrig

ABSTRACT

Insurance fraud has come under increasing scrutiny by risk managers, company claims managers, public policymakers, and academic researchers during the last fifteen years. Workers compensation insurance has always attracted employee claimants willing to fake on-the-job injuries, particularly those hard-to-verify injuries such as soft tissue or low back pain. In addition to managing individual claims for legitimacy, risk managers must respond to injury patterns through increased safety measures, but only when those injuries are legitimate. Distinguishing between legitimate and fraudulent claims can be a daunting task. This paper considers that task for one type of claims, those filed on the first day of the week.

We test the fraud hypothesis directly by using five years of available data from the Massachusetts Insurance Fraud Bureau (IFB) compared to the population of workers compensation claims for the 1990-1995 period. We find no difference in the inter-day distribution of substantive fraud referrals to IFB and all claims, lending additional support to the higher injury rate hypothesis for the elevated Monday claims. This result points all risk managers toward specifying additional "Monday" specific loss controls for their operations.

Keywords: Insurance fraud, workers' compensation, Monday effect.

JEL Classification: D80, G22.

RÉSUMÉ

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sinistres au sein des compagnies d'assurance, les assureurs publics et les chercheurs universitaires. L'assurance des accidents de travail a toujours attiré les réclamations frauduleuses d'employés inventant des histoires d'accidents sur les lieux du travail, particulièrement les réclamations difficiles à vérifier, comme celles reliées aux douleurs musculaires et aux maux de dos. En plus de gérer la véracité des réclamations individuelles, les gestionnaires de risques doivent répondre au besoin de concevoir des modèles liés aux mesures de sécurité en cas de blessures, lorsque telles réclamations sont faites légitimement. Il peut être parfois ardu de faire la distinction entre les réclamations fondées et celles qui sont frauduleuses. L'objectif de cet article est d'observer un type particulier de réclamations, celles qui sont présentées le premier jour de la semaine.

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Mots clés : *Fraude à l'assurance, indemnisation des accidents de travail, l'effet du lundi.*

Classification JEL : D80, G22.

■ INTRODUCTION

Insurance fraud has come under increasing scrutiny by risk managers, company claims managers, public policymakers, and academic researchers during the last fifteen years (Carris and Colin, 1997). Since the mid-eighties, numerous state and/or line specific fraud bureaus have been legislated into existence to deal with the fraud problem as it is perceived to drive up the legitimate cost of insurance (IRC, 1997). Workers compensation insurance has always attracted employees willing to fake injuries, particularly those hard-to-detect injuries such as soft tissue or low back pain. Researchers have observed that a disproportionate number of workers compensation lost day claims are reported to have occurred on a Monday, or the day after a holiday, the so-called Monday Effect (Smith, 1989). Explanations for the Monday Effect include covering uninsured weekend injuries, outright fraud, and simply higher injury or claiming rates after the weekend hiatus. Recent evidence using Minnesota "first report of injury" data, casts doubt on uninsured and fraud hypotheses (Card and McCall, 1996). Evidence from the U.S. Bureau of Labor Statistics 1992 survey of OSHA

records finds elevated levels of Monday claims, but no differential injury effect, due to the positive incentive efforts of wage replacement rates and doctor choice. The analysis of the BLS data appears ambiguous on the fraud hypothesis. (Ruser, 1998).

The availability of insurance has long been an attractor for “discretionary” injury claims. This is known as the moral hazard of insurance contracts (Doherty, 2000). The source of the moral hazard is the asymmetry of information about the claimed injury. The claimant has all the information; the employer/insurer has some or none of it. The availability, or increased availability, of insurance increases recovery time and promotes the filing of claims for lower back pain without a back-related injury. (Dionne and St-Michel, 1991 and Dionne, St-Michel and Vanasse, 1993) Lower back pain claims are difficult to diagnose and tend to preserve the asymmetry of information. The Monday effect problem is essentially one of asymmetric information but one that can ultimately be solved, on a selective basis, by a professional fraud investigation.

Using data from the five years of activity of the Insurance Fraud Bureau of Massachusetts (IFB), we classify workers compensation claim referrals for fraud into categories that include “sliding”, the false reporting of injury date or site. It is shown that (1) sliding represents a small proportion of both the referrals and acceptances by IFB and (2) the injury report dates of fraudulent claim referrals is similar to the overall distribution of injury dates. Both findings empirically reinforce the support for workplace safety and/or claiming incentives, not fraud, as the explanation for the Monday effect.

The paper proceeds by discussing insurance fraud as it applies to workers compensation in section 2. We distinguish between fraud, which is a criminal offense and build-up, which manipulates or abuses the intended uses of the workers compensation system. Build-up claims, while an undesirable aspect of the compensation system, are usually not per se a crime, but some observers may lump the two types together as an overly expansive definition of fraud. A classification system for alleged WC fraud (referrals) is then discussed. Section 3 reviews the “Monday Effect” and postulates a Monday claiming model. Massachusetts data for reported injuries and IFB referrals are introduced in section 4 to test the Monday model. A summary and conclusion appears in section 5.

■ WORKERS COMPENSATION FRAUD

□ Fraud and Build-up

The Workers Compensation Insurance (WC) system in the United States is intended to compensate workers injured on the job for their lost wages and medical expenses on a fault-free basis through private insurance plans. While fault for the injury may not play a role in determining qualification and continued eligibility, several factors play fundamental roles in determining who gets WC benefits and for how long. The circumstances surrounding the injury, the extent of the injury and lost time, the treatment patterns and duration, all are factors in the typical WC claim. The injury must have occurred when the employee was working for the insured employer; the claimant must wait the statutory minimum waiting period for lost time claims; and reasonable modalities of treatment to maximum medical improvement must be in place. Fraud can occur when one or more of those factors are falsified intentionally to gain benefit payments that would otherwise be undeserved and not forthcoming from the insurer.

Often insurance fraud is subdivided into hard and soft fraud. Hard fraud consists of those cases where criminal statutes have been violated by a premeditated intention to mislead the insurer by asserting material facts of the claim that are untrue. This fraud can be perpetrated by the claimant, acting on his/her own or in concert with a professional such as a doctor or an attorney.¹ Soft fraud maintains some, but not all, of the elements of hard fraud. Perhaps, the intention to commit fraud is missing or the treatment is prolonged when not absolutely necessary. Here, we wish to make clear that fraud is criminal fraud, or hard fraud, and must have evidence of intention to violate a law by seeking money or value under false pretenses, evidence that is clear and convincing beyond a reasonable doubt (Derrig and Krauss, 1994). We can borrow a common term from auto insurance, *build-up*, to apply to those claims where the on-the-job injury is real but exaggerated or where treatment and lost time is necessary but not to the extent claimed (Derrig, Weisberg and Chen, 1994). For WC insurance, hard-to-diagnose injuries such as lower back pain and strains and sprains are susceptible to build-up while most other injuries are not (Dionne, St-Michel and Vanasse, 1993)

□ Classification of WC Fraud

The WC system can be defrauded by any of the players in the process. Claimants, agents, attorneys, and the insuring employers all can gain by using false information for monetary gain. Insurance fraud is routinely prosecuted under general fraud statutes in the criminal code, but it is advantageous to have well defined statutes aimed at specifics of the insurance process. A Reform Law created such statutes for Massachusetts in 1991 and extended a fledgling Insurance Fraud Bureau (IFB), set up the prior year by auto insurers, to cover WC fraud on an equal basis (Derrig and Krauss, 1994, Johnston, 1997). Table 1 displays the categorization of IFB *referrals* alleging WC fraud for the period May 1991 to

TABLE 1
WORKERS' COMPENSATION IFB REFERRALS BY TYPE
OF FRAUD RANKED BY NUMBER OF REFERRALS
- MAY, 1991 TO AUGUST, 1996

<i>Referrals Submitted for Evaluation</i>				
Percentage	No. of Referrals	Type of Fraud	Total Loss Value	Average Non-Zero Loss Value*
38.0%	1227	Working While Collecting	\$19,611,467	\$52,158
12.6%	408	False Billing ¹	\$1,031,651	\$3,835
12.4%	400	Malingering	\$444,845	\$40,440
9.5%	308	False Loss Statement	\$4,832,945	\$45,168
7.8%	251	Staged Accident	\$4,720,001	\$31,892
6.1%	197	No Policy in Effect	\$0	\$0
5.7%	184	Premium Avoidance	\$25,999,595	\$1,238,076
3.6%	115	Professional Claimant	\$1,347,572	\$23,642
1.2%	38	Pre-Existing Injury	\$268,359	\$22,363
1.1%	34	False Application	\$135,111	\$22,519
1.0%	31	Sliding ²	\$423,662	\$38,515
0.7%	22	Professional Fraud	\$681,344	\$75,705
0.2%	8	Agent Thefts	\$900,000	\$900,000
0.2%	6	Multi-Lines	\$92,485	\$18,497
	3229	Total	\$60,489,037	\$57,109

* Undefined of 168 Referrals and \$1,645,127 in total loss value with and a Non-Zero value of \$29,911 was excluded.

TABLE 1 (CONTINUED)
WORKERS' COMPENSATION IFB REFERRALS BY TYPE
OF FRAUD RANKED BY NUMBER OF REFERRALS
- MAY, 1991 TO AUGUST, 1996

<i>Referrals Accepted for Investigation</i>				
Percentage	No. of Referrals	Type of Fraud	Total Loss Value	Average Non-Zero Loss Value*
34.4%	401	False Billing ¹	\$709,146	\$2,666
32.1%	374	Working While Collecting	\$12,362,367	\$54,460
10.6%	124	Staged Accident	\$3,142,510	\$29,646
7.6%	88	False Loss Statement	\$3,244,042	\$47,707
7.3%	85	Premium Avoidance	\$25,985,150	\$1,299,258
2.7%	32	Professional Claimant	\$666,908	\$28,996
1.4%	16	Malingering	\$155,582	\$51,861
1.0%	12	Sliding ²	\$393,536	\$49,192
0.9%	10	False Application	\$52,639	\$17,546
0.8%	9	Pre-Existing Injury	\$85,389	\$21,347
0.5%	6	Professional Fraud	\$492,900	\$123,225
0.3%	4	Multi-Lines	\$25,110	\$6,278
0.3%	3	Agent Thefts	\$900,000	\$900,000
0.1%	1	No Policy in Effect	\$0	\$0
	1165	Total	\$48,898,667	\$64,340

*Undefined of 39 Referrals and \$683,388 in total loss value with and a Non-Zero value of \$29,713 was excluded.

* Referrals with indeterminate loss values are assigned a zero dollar value.

¹ False Billing includes one case of 401 referrals.

August 1996. These referrals are made principally by the insurers, self-insurers, and the public through a "hot line" telephone number, but are supplemented on occasion by the Division of Industrial Accidents of the state government or by IFB personnel investigating related cases. Fraud by claimants constitute about 80 percent of the total referrals by count but only about 53 percent of the total value of the alleged frauds.²

Note the large difference between the two panels of Table 1. Only about one-third of the 3229 referrals were accepted for investigation; i.e., contained enough substance to warrant the time and

effort of an IFB investigator to prove or disprove (criminal) fraud. Most of the referrals refused acceptance come from the public that understands little about the WC system and even less about the criminal justice system.³ It is generally the public that alleges malingering as a fraud, but few (16/400) can possibly develop into a prosecutable offense since malingering per se is not a crime. Staged accidents, on the other hand, are usually reported by insurers after facts of the claims yields suspicion based on evidence. The acceptance rate for staged accident referrals is the highest in the claim fraud group, about 50 percent (124/251). These data relating perception (referrals) to reality (acceptances) support a certain skepticism when dealing with assumptions about which claims may be fraudulent, which are build-up and which are legitimate. The IFB data we review in subsequent sections will be for accepted referrals.

Several referrals may be related. Multiple claims for the same injury, many instances of false billing by the same medical provider, and hidden payroll over several policy years are some examples that might produce more than one referral for the same individual(s). Once a referral is accepted by IFB, it defines a *case* in which one or more referrals can be combined. Case counts are more reflective of the number of alleged criminal offenders; while referrals indicate the number of alleged counts of criminal activity. Table 2 shows the results of combining the 1165 accepted referrals into 535 cases, with working while collecting being the dominant type at about 54 percent of the total workers' compensation case count.

■ THE MONDAY EFFECT

□ Prior Studies

The *Monday Effect* is quite simply the observation that a larger number of on-the-job accidents are reported as occurring on Monday than on the remaining four days in the usual Monday-Friday work week.

Smith (1989) put forward circumstantial evidence that the WC "oral tradition" of reporting off-the-job injuries was responsible for the elevated level of claims on Monday. He hypothesized that certain types of injuries are amenable to delay from the time of the accident to the first workday after the accident and to deceptive description in order to hide the delay. Assuming all the excess

TABLE 2
IFB WORKERS' COMPENSATION CASES BY TYPE OF FRAUD
RANKED BY NUMBER OF CASES-MAY, 1991 TO AUGUST, 1996

<i>Total Cases</i>		
Percentage	No. of Cases	Type of Fraud
53.8%	288	Working While Collecting
14.6%	78	Premium Avoidance
10.7%	57	False Loss Statement
9.5%	51	Staged Accident
2.4%	13	Malingering
1.9%	10	Professional Claimant
1.9%	10	Sliding ¹
1.7%	9	Pre-Existing Injury
1.1%	6	False Application
0.7%	4	Professional Fraud
0.6%	3	Agent Thefts
0.6%	3	No Policy in Effect
0.4%	2	False Billing ²
0.2%	1	Multi-Lines
	535³	Total
<p>1. Sliding is real injury, but facts are changed so that injury is covered by workers' compensation.</p> <p>2. False Billing includes one case of 401 referrals.</p> <p>3. There are also 25 Cases of a non-specific nature and \$30,899 in total loss value.</p>		

claims are legitimate injuries, rather than completely bogus claims of injuries, he looks for elevated levels of claim types that can be feasibly used to misreport off-the-job injuries and those claim types that cannot. Choosing strains and sprains for the former and cuts and lacerations for the latter, Smith examines 1978-79 data for four states as reported to the Bureau of Labor Statistics for type of injury and time-of-day reporting. Days after holiday weekends were analyzed separately. Smith finds relatively more strains and sprains, reported earlier in the day, and fewer cuts and lacerations on Mondays, including days after holidays, than for other days of the workweek. He concludes that the excess is from off-the-job injuries rather than from some alternative source such as an

increased propensity for legitimate and fraudulent (for other reasons) strain and sprain claims occurring on Monday.

Card and McCall (1996) observe the same type of elevated claim filing on Monday in a large sample (10%) of 1985-1989 Minnesota first report of injury data. Those authors present a somewhat more direct test of the hypothesis that the excess Monday claims are as a result of higher rates of fraudulent claims, inclusive of the off-the-job injury misrepresentation type. Rather than consider injury types, Card and McCall look to a simple model of claim filing and claim monitoring behavior. The alternative hypotheses of higher injury rates vs. higher fraudulent claim rates are tested by incentives arising from the presence of medical coverage for the off-the-job injuries and the relative levels of monitoring and claim denials. The more medically uninsured, the more claims reported; the more monitoring and denials, the more consistent with the fraud hypothesis. The absence of a difference in monitoring and denials on Monday vs. the remaining days of the work week indicates the absence of excess fraudulent claims.

Card and McCall observe the same elevated reporting of back injuries⁴ as Smith's easy-to-conceal strains and sprains, but test the off-the-job source of those claims as those arising from lack of medical coverage. They find no difference in reporting rates, even for back injuries. Similarly, the authors find no difference in monitoring or denial levels (10.3% denied Tuesday-Friday vs. 10.2% on Mondays, p.701).

Ruser (1998) examines a large nationally representative stratified random sampling of more than 500,000 non-fatal injury and illness cases involving at least one lost work day. The data were accumulated at BLS using OSHA required reports supplemented by workers' compensation agency data. Imputed wage replacement rates, state-specific waiting periods and a dummy variable for workers' choice of his or her own doctor completed the analytic dataset of about 38,000 observations. Ruser's approach is to test for the Monday effect by comparing (1) the differential likelihood of had-to-diagnose injuries (back sprains), cuts and fractures and (2) the influence of wage replacement rates and doctor choice on Monday (and day after holiday) injury reports.

Ruser finds sprains to be more likely on Mondays for all lost day cases (Table 6) but less likely for cases with more than 3 days lost (Table 7). Larger wage replacement rates and doctor choice induce more Monday claims of all kinds. These findings are consistent with worker-generated claims reporting moral hazard, similar

to discretionary or build-up injuries, but do not point to off-the-job injuries as the source of the elevated proportion of Monday claims.

Each of the three studies discussed above has resorted to indirect inference for the presence or absence of fraudulent off-the-job injuries reported as WC claims on Monday. Each seeks consequences of some assumed form of those fraudulent claims: one finds evidence of the consequence (Smith finds strains and sprains) and two do not (Card and McCall find no extra monitoring and denials; Ruser finds elevated claims of all injury types). Neither looks to empirical data for fraudulent claims to test the hypotheses of fraud because neither had such direct data available to them. In the remaining sections, we offer a simple model of overall and fraudulent claiming, with the misrepresentation of off-the-job injuries as a separate feature of the model. The fraud hypothesis can then be tested directly against Massachusetts data for the more likely explanation for elevated Monday reported claims.

□ A "Monday" Claim Model

For all days except Monday let us assume a uniform (compensable) accident rate α per hour h worked.⁵ Let Monday have an increased accident rate per hour worked that is some multiple $(1 + m)$ of the compensable rate. Then the number of compensable accidents, by day of week is:

$$A_t = \begin{cases} \alpha h_t & t \neq \text{Monday} \\ \alpha(1 + m) h_t & t = \text{Monday} \end{cases} \quad (1)$$

Assume F_t , ordinary fraudulent claims, are proportional to the (compensable) injury claims; say βA_t . Suppose some number of the "Saturday and Sunday" non-compensable claims, p , are filed fraudulently on Monday. This type of fraud is called "sliding". Then the number of claims filed by day of week C_t is:

$$C_t = \begin{cases} \alpha(1 + \beta) h_t & t \neq \text{Monday} \\ \alpha(1 + m) [1 + \beta(1 + s)] h_t & t = \text{Monday} \end{cases} \quad (2)$$

where $p = \alpha\beta s(1 + m) h_t$, the increase in fraudulent Monday claims by sliding.⁶

With the above notation, the Monday effect hypotheses can be formulated as follows:⁷

1. The Monday effect results from increased injuries

$$H^1_0 = \{m > 0, s = 0\}$$

2. The Monday effect results from fraudulent sliding claims

$$H_0^2 = \{m = 0, s > 0\}$$

3. The Monday effect results from both increased injury rates and fraudulent sliding claims

$$H_0^3 = \{m > 0, s > 0\}$$

Under all the above hypotheses, the fraudulent claims by day of week are:

$$F_t = \begin{cases} \alpha\beta h_t & t \neq \text{Monday} \\ \alpha\beta h_t(1+m)(1+s) & t = \text{Monday} \end{cases} \quad (3)$$

Note that this simple formulation implies that the ratio of claims to fraudulent claims is:

$$C_t/F_t = \begin{cases} 1 + \beta^{-1} & t \neq \text{Monday} \\ 1 + [\beta(1+s)]^{-1} & t = \text{Monday} \end{cases} \quad (4)$$

Under hypothesis 1, no fraudulent sliding claims, C_t and F_t would have the same distribution of claims by day of the week. Under hypotheses 2 and 3, additional fraudulent sliding claims on Monday, C_t and F_t would have different distributions by day of week. We now test the similarity of the total claim and fraudulent claim distributions using Massachusetts data.

■ MASSACHUSETTS DATA

□ First Report WC Claim Data

As with the prior studies, we look to the first report of injury as our source for the population of claims. We prefer to use an alternative source, the Central Index Bureau (CIB)⁸ rather than the state-run Department of Industrial Accidents, solely because the Massachusetts claims from that database have been made available on a detail basis to the IFB. Having the detail data in electronic form allows for flexible summarization, specifically the ability to adjust the date of loss to "Monday", if it occurs the day after a holiday. Table 3 compares the distribution of claims reported with a true Monday incident date, with those claims supplemented by claims with incident dates following a holiday, and for contrast, insured automobile injury claims by days of loss.

The Monday effect is clearly represented in both the adjusted and unadjusted Massachusetts WC injury claims. The unadjusted

TABLE 3
REPORTED INJURIES BY DAY OF WEEK

	WC Injuries		Auto Injuries
	Reported	Adjusted for Holidays	Reported
Monday	19%	22%	13%
Other Weekdays	17%	16.5%	15%
Weekend	6%	6%	13.5%

Massachusetts distribution is somewhat similar to the Minnesota first report data in the Card and McCall study (Table 1, p.693). The Minnesota Monday claims were slightly larger at 21 percent, the other weekday claims about the same at 17 percent per day, and the weekend claims slightly smaller at 5 percent per day. The Smith study (Table 5-1, p.120) also reported about 20 to 21 percent of the claims occurred on the day after a weekend, Monday or Tuesday following a holiday, compared to the adjusted Massachusetts 22 percent for Mondays and all weekdays following a holiday. Ruser reports significantly higher levels of Monday claims (27.5% sprains, 25% cuts, 24.6% fractures in Table 5, p.118) with at least 3 lost work days. Thus our Massachusetts CIB data source compares well with the prior studies official first report of injury data but less so when compared to the BLS data set.

☐ Insurance Fraud Bureau Data

The first five years of the Massachusetts IFB data, collected in referrals from 1991 to 1996, provides a good proxy for fraudulent claims by using the counts of WC referrals discussed in section 2. Considering the uncertain nature of referrals from the general public, we choose to use only those referrals accepted for investigation by IFB. These referrals would most closely represent those claims challenged by employers as not compensable because of fraud, the claim type tested in the Card and McCall study. Table 4 shows the 1990-1995 WC acceptance counts by incident day of the week, after adjustment for holidays.

For these data, the Tuesday claim percentage looks somewhat low, but that is simply due to the movement of Tuesday day-after-holiday claims to Monday. In order to test our simple Monday

TABLE 4
WORKERS' COMPENSATION REFERRALS ACCEPTED FOR INVESTIGATION BY INCIDENT DAY OF WEEK

Years	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Grand Total
1990	11	51	33	42	58	33	15	243
1991	13	68	42	47	62	59	22	313
1992	18	64	34	38	44	37	13	248
1993	8	22	12	22	17	30	15	126
1994	4	23	21	14	14	12	7	95
1995	4	12	9	15	14	14	1	69
Grand Total	58	240	151	178	209	185	73	1094

Years	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Grand Total
1990	5%	21%	14%	17%	24%	14%	6%	100%
1991	4%	22%	13%	15%	20%	19%	7%	100%
1992	7%	26%	14%	15%	18%	15%	5%	100%
1993	6%	17%	10%	17%	13%	24%	12%	100%
1994	4%	24%	22%	15%	15%	13%	7%	100%
1995	6%	17%	13%	22%	20%	20%	1%	100%
Grand Total	5%	22%	14%	16%	19%	17%	7%	100%

Note: Claims cited a day after a holiday are treated as Monday claims.
Source: Insurance Fraud Bureau of Massachusetts

TABLE 5

MASSACHUSETTS FIRST REPORTS OF WORKERS' COMPENSATION CLAIMS

Year	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Grand Total
1990	1528	8918	5909	6430	6363	6536	2483	38167
1991	2133	10868	7665	7713	7763	8455	3308	47905
1992	2128	9643	6558	7277	6737	7463	3017	42823
1993	2314	9831	7068	7580	7242	7995	3304	45334
1994	2632	11340	8345	9116	8840	9225	3925	53423
1995	2448	10950	7508	8554	8409	8598	3664	50131
Grand Total	13183	61550	43053	46670	45354	48272	19701	277783

Years	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Grand Total
1990	4%	23%	15%	17%	17%	17%	7%	100%
1991	4%	23%	16%	16%	16%	18%	7%	100%
1992	5%	23%	15%	17%	16%	17%	7%	100%
1993	5%	22%	16%	17%	16%	18%	7%	100%
1994	5%	21%	16%	17%	17%	17%	7%	100%
1995	5%	22%	15%	17%	17%	17%	7%	100%
Grand Total	5%	22%	15%	17%	16%	17%	7%	100%

Note: Claims cited a day after a holiday are treated as Monday claims.

Source: Central Index Bureau Data as compiled by Insurance Fraud Bureau of Massachusetts

Effect model we will need WC total claims in the same format. Table 5 displays the Massachusetts First Reports of WC claims from the CIB comparable to the IFB acceptance data.

☐ **Monday Model Parameter Estimation**

Monday claims account for about 5 percent more weekly claims than the other weekdays after adjustment. The same is true for the IFB accepted referrals. Indeed, given the adjusted first report claim data distribution by day, the IFB data distribution by day does not differ significantly from it on a pooled basis (Chi-Square of 12.6 at 95% with 6 degrees of freedom). These data suggest that the additional accident rate for Mondays (m) is about 30 percent (22/17) and the rate for fraudulent sliding claims (s) is negligible, even if they are recorded by IFB under a category other than the official sliding category. Therefore hypothesis 1 of the Monday model is supported by Massachusetts data, while hypotheses 2 and 3 are rejected.

■ SUMMARY AND CONCLUSION

This paper has examined the so-called Monday Effect of WC claims, the fact that proportionately more claims are reported on Mondays than on other days of the work week. Prior speculation has been that the elevated claim level is a result of reporting off-the-job injuries by fraudulently misrepresenting them as on-the-job Monday claims. Alternatively, workplace safety and the propensity for higher level of accidents on Monday has been offered as an alternative to the fraud hypothesis. Both explanations for the Monday Effect have been tested using indirect inference or circumstantial evidence with mixed results (Smith, 1989; Card and McCall, 1996; Ruser, 1998). We proposed here a more direct test of the two hypotheses in light of data available from the Insurance Fraud Bureau of Massachusetts.

Summarizing WC claims and IFB fraud referrals as proxies for fraud claims, we find no difference in the distributions of each by day of the week, even adjusting for days after holidays. Similar empirical distributions are consistent with the hypothesis of elevated true or discretionary injury claims on Mondays, and their

accompanying fraud level. Similar distributions are not consistent with the off-the-job injury explanation of the Monday Effect. Employers or risk managers monitoring WC claims filed for off-the-job injuries should report a large volume of alleged fraud known as sliding, if the off-the-job Monday Effect holds. That is not the case in the Massachusetts data in which only 12 referrals in five years have been accepted for investigation when sliding was alleged as the fraud. This result points risk managers toward specifying additional "Monday" specific loss controls for their operations.

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□ Notes

1. Fraud perpetrated and controlled by a claimant's legal and/or medical provider has been likened to a lottery with the professional as the lottery manager and the claimant holding the lottery ticket with an uncertain payoff (Derrig, Weisberg and Chen, 1994).

2. The IFB value of a referral is the total dollar amount of the incident, the claim(s) or the bogus premium, and not the dollar amount that might be proved to be criminally fraud. This dollar assignment is usually accessible in most referrals; is consistent; and is assignable to allegations as well as convictions.

3. As an example, a survey by the Roper Organization found that 37 percent of the respondents thought that WC was a fault-based system, whether or not the respondents had had a WC claim in the past (IRC, PAM, 1991).

4. While strains and sprains and back injuries are often treated as the preferred injuries for build-up (Dionne and St-Michel, 1991), Card and McCall (1996) point out (p.699) that they are different injuries with only about a 30-55% overlap in classification.

5. "Monday" here includes the first work day after a routine day without work (Sunday) or after a holiday.

6. The number of sliding claims p need not be proportional to the fraudulent claim rate β . Equation (4) obtains with or without p proportional to β .

7. The Monday effect could theoretically result from increased hours worked relative to the other weekdays. We do not consider that possibility in this simple formulation. Card and McCall (1991, p698) find the assumption of equal work hours on weekdays to be reasonable when retail workers are excluded.

8. The CIB is a national insurance claim database of liability and injury claims voluntarily reported by members and subscribers for the purpose of tracking prior claims histories of newly arising claimants. CIB has been functioning for auto and WC claims for about 40 years. The CIB is now a part of the Insurance Services Office (ISO) All Claims Database.