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Correlates of Workers' Compensation Claims Adjustment

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ABSTRACT

Using a sample of New York nonscheduled permanent disability claims, this article estimates the probability of controversion (the act of denying liability for a workers' compensation claim) and the conditional probability of benefit reductions initiated by insurers. The data suggest that insurers are more likely to adjust claims where the probability of a successful adjustment (i.e., an adjustment that is upheld by the workers' compensation board) is high. Although there is some evidence that insurers are more likely to adjust more costly claims, benefit levels are negatively related to adjustment probability, contrary to expectations. These results indicate that insurers are less likely to adjust high benefit claims since these claimants are more likely to resist adjustment efforts.

Introduction

One of the unique features of workers' compensation as a social insurance program is the participation of private insurers. Unlike unemployment compensation, social security, Medicare, Aid to Families with Dependent Children, or food stamps, the workers' compensation program in the United States is largely administered by and financed through private insurers. Private insurers provide compensation insurance in all but six states.¹ Historically, private insurers have accounted for between 50 and 60 percent of total workers'

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¹ In those six states, workers' compensation benefits are provided by an exclusive state insurance fund; in 13 states, workers' compensation benefits are provided by both state funds and private insurers.

compensation benefits paid. Furthermore, although state agencies or courts supervise the administration of the compensation program, the overwhelming majority of injuries in most states are resolved between the insurer and the claimant without substantial governmental involvement.

Although its decisions are subject to review by a government agency or the courts, the insurer first determines whether the claimant is entitled to benefits and, if so, the amount of compensation due. Insurers and employers are not disinterested participants in this process.² As Ehrenberg (1988, p. 76) has pointed out, "As long as workers' compensation benefits are at least partially experience rated, higher benefits will increase employers' incentives both to challenge claims and to encourage injured workers to speed their recovery and return to work."³

This article examines two aspects of the claims adjustment process—the controversion of claims and insurer initiated benefit reductions—using a sample of permanent partial disability claims from the New York workers' compensation program. In particular, this study seeks to determine the extent to which economic factors unrelated to the merits of the claim affect the insurer's propensity to controvert the claim. Second, this article examines factors that determine the insurer's propensity to reduce or cease benefit payments to the claimant once liability has been established. Specifically, this article will estimate a model for predicting whether a claim will be controverted by the insurer and a model for predicting the amount of time between the date of injury and the point at which the insurer first reduces (or eliminates) the claimant's compensation benefits.

A substantial empirical literature suggests that the employee response to changes in parameters of workers' compensation programs has a more significant effect on the compensation system than the response of employers or insurers. Higher compensation benefits are associated with more frequent injuries and claims, longer periods of disability, and a higher probability of permanent disability (see Ehrenberg, 1988; Krueger, 1990a; Thomason and Burton, 1993). However, unlike previous studies, this article examines measures more completely under the control of the insurer/employer; that is, claim controversion or the reduction or cessation of benefits. As noted by Ehrenberg (1988, p. 85), "no researcher has attempted to analyze whether challenges of claims by employers (whether at the outset or while a claim is in progress) are related to the level of benefits."

The next section reviews relevant aspects of the New York workers' compensation program, namely the method by which permanent partial disabilities the population of claims upon which these analyses were based are compensated and regulation of the New York claims adjustment process. Then, a rudimentary theory of claims adjustment is presented, followed by a

² In some instances, the "insurer" is a self-insured employer.

³ Although Ehrenberg refers to employers, it is the insurer that manages the claim. However, where the employer purchases insurance from a private insurer in a competitive market, we may expect that the insurer will act as the employer's agent.

discussion of the data and statistical methodology, the results of the analyses, and a conclusion.

New York Workers' Compensation Program

Permanent Partial Disability Compensation

Two fundamentally different approaches to permanent partial disability benefits are utilized in New York, depending upon the type of injury involved. For *scheduled* injuries, which involve the total or partial physical loss or loss of use of an extremity (such as a toe, hand, leg, etc.), loss of sight in one eye, or hearing in one or both ears, the weekly amount and duration of benefits are specified by statute. A worker who suffers a scheduled injury is entitled to benefit payments for a certain length of time, depending upon the nature and seriousness of the injury. Injuries other than scheduled injuries (termed *nonscheduled* injuries) are compensated using a wage-loss approach. The weekly benefit amount is 66⅔ percent of the difference between the worker's pre-injury earnings and the worker's actual earnings after the medical condition has stabilized. For those workers with no actual earnings after the medical condition has stabilized, a percentage of disability (loss of earning capacity) is determined (for example, 25 percent); the weekly benefit is 66⅔ percent of the loss of earnings capacity multiplied by pre-injury earnings. For nonscheduled permanent partial disabilities, the period for which the claimant may receive compensation is not limited by statute; rather, benefits may continue as long as the worker is experiencing lost earnings due to the injury, which can extend over the remainder of the workers' life.

Claimants suffering nonscheduled permanent partial disabilities in New York may settle their claims with a lump sum settlement or final adjustment. These settlements, called compromise and release agreements in other jurisdictions, release the employer from all further liability (for both indemnity and medical benefits) in exchange for a lump sum cash settlement. In New York, compromise and release agreements are confined to nonscheduled permanent partial disabilities. Lump sum settlements are further limited to those cases where: (1) "the continuance of disability and of future earning capacity cannot be ascertained with reasonable certainty," (2) "the right to compensation has been established," and (3) compensation has been paid to the claimant for at least two months (New York Workers' Compensation Law § 15 (5-b)). In addition, the Board will not permit agreements where medical treatment has been required within the three months immediately prior to the agreement or where there are outstanding payments or bills for either cash benefits or medical treatment. Nor will the Board approve compromise settlements when the worker is totally rather than partially disabled. All lump sum settlements must be approved by a member of the Board.

Finally, the Board asserts continuing jurisdiction over the claim, and cases may be reopened "upon proof that there has been a change in condition or in the degree of disability of the claimant not found in the medical evidence and, therefore, not contemplated at the time of the adjustment" (New York

Workers' Compensation Law § 15 (5-b)). Thus, while disputes may occur on a variety of issues concerning questions of both liability and the extent of disability, settlements are possible for only those claims where insurer liability has been established and where it has been determined that the claimant is suffering from a nonscheduled permanent partial disability.

Since the New York Board asserts continuing jurisdiction over all claims and since any claim may be reopened after closing, New York does not technically permit compromise and release agreements for any type of injury. It is theoretically possible for claims closed with a lump sum to be reopened. However, Burton, Partridge, and Thomason (1986) found that, in fact, lump sum settlements are rarely, if ever, reopened, and so, *de facto*, New York lump sum settlements are virtually indistinguishable from compromise and release agreements. However, they also found that claims closed with continuing benefits or "no present loss of earnings" are often reopened and are typically reclosed with lump sum settlements.

Nonscheduled permanent partial disabilities in New York are singularly useful for an examination of the claims adjustment process. Data on the distribution by disability of New York workers' compensation claims that were closed in 1983 indicate that, while nonscheduled claims represented less than 5 percent of total claims, they represent over 50 percent of the total cost of disability benefits (see Table 1).

The high cost of nonscheduled claims is at least partially due to the fact that nonscheduled permanent partial disability benefits in New York are paid for life. On one hand, unlimited benefits create a moral hazard; claimants have an incentive to malingering and delay recovery. A number of studies have shown that the duration of temporary disability is positively related to the level of compensation benefits (e.g., Butler and Worrall, 1985; Worrall and Butler, 1985; Johnson and Ondrich, 1990; Meyer, Viscusi, and Durbin, 1988; Dionne and St-Michel, 1991; and Krueger, 1990b). On the other hand, the high potential costs of such claims and moral hazard problems may induce insurers to challenge claims in order to encourage claimants to return to work.

Table 1
Frequency, Average Cost, and Total Cost of Compensation,
by Type of Disability for 1983 New York Workers' Compensation Claims

<i>Type of Disability</i>	<i>Number of Cases</i>	<i>Percent of All Cases</i>	<i>Amount of Compensation^a</i>	<i>Percent of All Compensation</i>	<i>Average Cost per Case</i>
All Disabilities	113,270	100.00	\$519,345	100.00	\$4,585
Death	460	0.41	\$40,717	7.84	\$88,516
Permanent Total	94	0.08	\$12,464	2.40	\$132,601
Permanent Partial	44,323	39.13	\$390,034	75.10	\$8,800
Scheduled Awards	39,385	34.77	\$119,245	22.96	\$3,028
Nonscheduled Awards	4,938	4.36	\$270,789	52.14	\$54,838
Temporary Total	68,393	59.57	\$76,130	14.66	\$1,113

Source: New York Workers' Compensation Board, Closed Case Tapes.

^a Thousands of dollars.

Lump sum settlements are one way to reduce compensation costs. Thomason and Burton (1993), using the same sample of New York permanent partial disability claims that is analyzed in this study, found that claimants who accepted lump sums discounted the stream of future benefits by approximately 25 percent on average. This high discount rate represents a substantial savings for insurers. In addition, Thomason and Burton found that claims adjustment activity increased the probability of settlement, although it did not affect settlement size.⁴

Regulation of Insurer Claims Adjustment

A 13-member Workers' Compensation Board administers the New York workers' compensation program. The Board's efforts are supported by a bureaucracy that is principally responsible for claims processing. The claims process begins with the Board's receipt of an accident notice from one of three sources: the employer, the injured worker, or the worker's attending physician. Upon receipt, the Board makes an initial determination concerning the severity of the injury. Minor or nonserious claims are placed into a "no claims" file. More serious claims are "indexed"; that is, an identification number is assigned to the claim and a folder is prepared to house documents related to the claim. "No claims" cases are inactive unless a hearing is requested by the claimant. Indexed claims may be closed only after a hearing before an administrative law judge.

Upon notification of the employee's disability, the insurer must either controvert the claim or begin compensation without waiting for a formal hearing. Payments (or notice of controversion) must begin within 18 days of the claimant's injury or within 10 days of the time that the employer first had knowledge of the accident, whichever is later.⁵ Insurers who fail to begin payments in a timely fashion are subject to a penalty of 10 percent of the compensation due. Failure to provide timely notice of controversion subjects the insurer to a \$50 fine. Controversion "without just cause" subjects the insurer to a fine of up to 15 percent of the claimant's award.

Claims that involve permanent disabilities typically are not resolved after a single hearing. Normally, the administrative law judge will award "temporary reduced earnings" with payments to continue, holding the claim in abeyance. While no statistics are available, a review of claim files reveals that there are typically one to four hearings a year for as long as the claim remains open. The

⁴ Thomason and Burton counted the number of insurer adjustments (where the insurer had reduced or ceased paying benefits on the claim) that were later reversed by the Workers' Compensation Board (i.e., the Board reinstated benefits to a level higher than that set by the insurer at the time the claim was adjusted). They used this count as a measure of insurer adjustment activity in a model predicting the size and probability of a lump sum settlement. They also estimated models for predicting both the total number of insurer adjustments and the number of adjustments later reversed by the Board.

⁵ Insurers who are first notified of the injury by the Board's notice that the claim has been indexed are allowed 25 days from the mailing of the index notice to controvert the claim.

insurer may stop or reduce payments to claimants as long as the case remains open upon submission of evidence justifying such an action. Justification for a modification or suspension of benefits could include medical evidence that the claimant's condition has improved or evidence that the claimant has returned to work. The insurer is also entitled to require that the claimant submit to medical examination by certified doctors of the insurer's choosing. The claimant's failure to submit to an examination provides the insurer with the necessary rationale for suspending benefits. Of course, the insurer's physician's report often provides the medical evidence to justify benefit suspension or reduction.⁶ The Board is required to schedule a hearing within 20 days of the insurer's notification of an intention to suspend or modify benefits.

Data on the frequency of insurer claims adjustments (or interventions) for the sample analyzed by this study indicate that, while some claimants experienced up to 10 insurer-initiated benefit reductions or suspensions before the claim was closed, 190 out of 990 claims were never adjusted, and 265 claimants experienced only a single adjustment. Further, more than two-thirds of the claims were adjusted less than three times during the life of the claim (see Table 2).

Table 2
Number of Claims Adjustments per Compensation Claimant,
New York Nonscheduled Permanent Partial Disability Claims

<i>Number of Adjustments</i>	<i>Frequency</i>	<i>Percent</i>	<i>Cumulative Frequency</i>	<i>Cumulative Percent</i>
0	190	19.2	190	19.2
1	265	26.8	450	46.0
2	229	23.1	683	69.1
3	138	14.0	826	83.0
4	94	9.5	916	92.5
5	39	3.9	956	96.6
6	17	1.7	973	98.3
7	10	1.0	982	99.2
8	5	0.5	987	99.7
9	1	0.1	988	99.8
10	2	0.2	990	100.0

This review of the New York claims administration process indicates that insurers can influence the ultimate disposition of the claim in a number of ways. By requiring the claimant to submit to repeated medical examinations or

⁶ Benefit payments also may be suspended or modified in closed cases where the insurer has been directed to continue to pay disability benefits. However, this may be done only after the insurer has filed an application to reopen the claim and the Board has made a final determination of the application unless the insurer's employer provides supporting payroll evidence demonstrating that the claimant's wage loss is less than the wage loss that was determined at the time the case was closed.

by gathering evidence through other means, such as surveillance, the insurer may collect evidence that will justify a reduction in benefits and strengthen a defense against a permanent disability claim. The insurer may also weaken the claimant's resolve to pursue a permanent disability claim by controverting the claim or by reducing or eliminating benefits. However, these claims adjustment activities are not undertaken without costs, including physician and legal fees as well as possible fines and penalties.

Insurer Claims Adjustment Activity

A simple economic theory of the claims adjustment process might postulate that insurer adjustment activities such as controversion or the reduction of benefits have the effect of reducing benefit costs. However, the relationship between adjustment activities and cost reduction is uncertain. The claimant may appeal insurer adjustments, and, consequently, the courts or the compensation board may reverse the insurer's decision and restore benefits to the claimant, resulting in no cost reduction for the insurer. In addition to potential cost savings, the insurer will also consider the potential costs of claims adjustment. These costs include expenses that will be incurred with certainty (for example, physician fees where the reduction of benefits must be preceded by a medical report) and uncertain expenses such as fines or penalties that may be levied if the compensation board determines that the insurer's adjustment activities are unjustified.

The probability of an insurer adjustment should be positively related to the expected value of the adjustment and negatively related to its cost (in terms of fines or penalties). The expected value of adjustment is a function of the benefit costs that will be avoided if the adjustment is successful (i.e., not reversed by the compensation board) and the probability of success. Cost savings increase as benefit levels increase so that, from the insurer's perspective, adjustment probability should be positively related to higher weekly benefits.

As stated above, the probability that a claimant will receive benefits depends in part upon his or her determination to pursue the claim. Consequently, insurers will be more likely to adjust the claims of injured workers who are likely to surrender their benefits than the claims of workers who are willing to make the necessary efforts to ensure that lost benefits will be restored. Of course, as noted below, the claimant's resolve to pursue a compensation claim will increase with benefit levels, reducing the probability that the adjustment will be successful. To the extent that the insurer is aware of this relationship, higher benefits would reduce the probability of adjustment.

Data and Methodology

This article uses data from a stratified random sample of 990 New York workers' compensation claims.⁷ These claims were drawn from the universe of nonscheduled permanent partial disabilities that were initiated by claimants who were at least 20 years old on the date of injury and were the result of injuries occurring in 1972 and initially closed before 1983. Case folders obtained from the New York Workers' Compensation Board were examined to determine all claim developments prior to December 31, 1987. Data were gathered from these folders on the identity of the insurer responsible for the claim; claimant characteristics such as age, sex, and marital status; the history of the claim, including the history of insurer adjustment activities and board awards; and whether and when the claimant may have retained legal counsel. Missing data reduced the size of the sample to 881 claims. An additional 37 claims were dropped from the duration analyses because the claims were closed at the same hearing at which benefits first began to be paid. (In other words, because the survival models estimate duration from the initial payment of benefits to the first insurer intervention *prior to closure*, the survival duration for these claims is effectively zero.)

Statistical Methodology

Two aspects of the claims adjustment process were examined. The probability of the insurer denying liability for the claim by controverting it was investigated by estimating a probit equation where the dependent variable is a dummy equal to one if the claim was controverted and zero if it was not. Second, the insurer's propensity to reduce or cease paying disability benefits once liability has been established is examined by estimating hazard rates where the hazard is an insurer-initiated reduction or cessation of benefit payments. All adjustments were included in the sample, including those that were later reversed by the workers' compensation board. The dependent variable is the length of time between the initial payment of benefits and the first insurer intervention. ("Intervention" refers to a reduction or suspension of compensation benefits.) More aggressive claims adjustment strategies should result in a shorter duration between initial payment and adjustment.

Since closed claims are less susceptible to intervention than open claims (particularly claims that are closed with a lump sum settlement or because the claimant died), this study only investigates adjustments that occurred prior to the closing of the claim. (Only 101 out of 1,949 total interventions—or 5.18 percent—occurred after the claim was closed.) Adjustment duration is therefore

⁷ The sample was stratified by age, sex, type of initial closing (whether the claim was settled with a lump sum adjustment or adjudicated with either continuing benefits or no current loss of earnings), and whether the claimant had retained legal counsel. We oversampled women, younger and older (as opposed to middle-aged) workers, claims originally closed through adjudication, and claimants who had not retained legal counsel. Analyses described in the text were weighted to reflect these population characteristics.

censored at the date of initial close. Consequently, estimation of survival duration using ordinary least squares is inappropriate. Rather, hazard rates—or the rate at which the insurer adjusts the claim during a small interval, dt , given that the insurer has not intervened prior to that time—were estimated. The hazard rate may be represented as $h(t) = f(t)/S(t)$, where $S(t) = 1 - F(t) = \text{pr}(T \geq t)$ is the survivor function or the probability that the insurer will not intervene prior to time t , and $f(t)$ is the corresponding probability density function of the distribution function $F(t)$.

The estimation of intervention times in the following analyses assumes that the adjustment duration (t_i) is related to the vector of explanatory variables X by

$$\ln(t_i) = bX_i + \sigma w_i. \quad (1)$$

The probability density of w is specified as the Weibull or the log-logistic, so that the underlying survival and hazard functions are, respectively,

$$S(t) = \exp(-(\lambda t)^p) \quad (2)$$

$$h(t) = \lambda p(\lambda t)^{p-1} \quad (3)$$

for the Weibull, and

$$S(t) = \frac{1}{1 + (\lambda t)^p} \quad (4)$$

$$h(t) = \frac{\lambda p(\lambda t)^{p-1}}{1 + (\lambda t)^p} \quad (5)$$

for the log-logistic where $\lambda = e^{-B'X}$ and $p = 1/\sigma$.

Duration dependence refers to the relationship between the exit rate and survival. If the hazard declines with increased survival, positive duration dependence exists; if the hazard increases with increased survival, we have negative duration dependence. The log-logistic and Weibull models treat duration dependence differently. The Weibull distribution allows either negative (if $p < 1$) or positive (if $p > 1$) duration dependence, but not both. However, while duration dependence in the log-logistic is negative if $p \leq 1$, if $p > 1$, duration dependence is positive up to the point where $t = ((p - 1)/\lambda)^{1/p} = ((1/\sigma - 1)/e^{-B'X})\sigma$ and is negative beyond that point.

The problem of heterogeneity in the survival distribution across individuals is well known (Kiefer, 1988). An incorrect assumption of homogeneity may result in inconsistent parameter estimates and incorrect standard errors. In order to correct for this problem, the Weibull specification was modified to include a random variable, v , to capture heterogeneity so that the survival function conditional on v is

$$S(t|v) = v \{ \exp[-(\lambda t)^p] \}, \quad (6)$$

where, assuming that v is distributed as gamma with mean equal to R/k so that

$$f(v) = [kR/\Gamma(R)]e^{-kv}v^{R-1}, \quad (7)$$

so that the survival and hazard functions become

$$S(t) = [1 + \Theta (\lambda t)^p]^{-1/\Theta} \quad (8)$$

$$h(t) = \frac{\lambda p (\lambda t)^{p-1}}{[1 + \Theta (\lambda t)^p]}, \quad (9)$$

where $\Theta = 1/k$. The greater the deviation of Θ from zero, the greater the effect of heterogeneity (Greene, 1991).

Finally, since, as noted below, several explanatory variables change value during the observation period, models included time-varying covariates. The observation period is partitioned into k exhaustive, nonoverlapping intervals, $t_0 < t_1 < \dots < t_{k-1} < t_k$. Covariates are constant within each interval but may change from one interval to the next. The hazard function is then modeled as a step function: time-varying covariates may assume different values at each interval between t_0 and t_k , the point at which censoring or exit occurs. The estimation technique is based on the work of Peterson (1986a, 1986b). Further details of estimation procedures may be found in Greene (1991).

Explanatory Variables

The model of the claims adjustment process presented above hypothesizes that insurer adjustments depend upon potential cost savings, the probability that the adjustment will be successful (i.e., upheld by the workers' compensation board), and the cost of intervention. Several variables are used in the following analyses to capture the effects of potential cost savings and adjustment probability. Unfortunately, the data do not contain information concerning intervention costs. Consequently, these costs were assumed to be either fixed (such as fines and penalties) or randomly distributed (such as physician fees and litigation costs) across claims.

Models incorporate five variables measuring the effect of potential cost savings on adjustment activity. Since claimants receive lifetime benefits, benefit costs are negatively related to age. Thus, insurers have greater incentive to adjust the claims of younger claimants, so claimant age should be positively related to controversion probability and negatively related to adjustment survival. Apportionment of liability between two or more insurers will reduce benefit costs for each insurer. Therefore, a dummy variable that indicates whether the claim has been apportioned should be positively related to adjustment probability. Apportionment is treated as a time-varying covariate in survival models.

Finally, potential cost savings are positively related to the level of compensation benefits. Three variables measure compensation benefits: claimant benefits at the time of the adjustment (survival models) or at the time the claim was closed (controversion probability), which measure current bene-

fits, and pre-injury wages (and pre-injury wages squared), which measures potential benefits.⁸

Compensation benefits and pre-injury wages—because of their effect on claimant behavior—also influence the probability of adjustment. To the extent that claimants affect the probability that adjustments are successful (i.e., they are upheld by the workers' compensation board) or unsuccessful (i.e., they are reversed by the board), they also affect adjustment probability.

From the claimant's perspective, benefits and wages have both substitution and income effects.⁹ Higher wages increase claimant wealth (income effect). Assuming that resistance to claims adjustment is a normal good, claimants who earn high wages will resist insurer adjustment efforts more vigorously than claimants who earn low wages. Wages also increase the opportunity cost of resistance (substitution effect), so that the net impact of wages on claimant resistance depends on whether the income or the substitution effect is more influential. If the income effect dominates, high-wage claimants will be more persistent than low-wage claimants in their pursuit of benefits. The opposite is true if the substitution effect dominates. If claimant resistance reduces the probability that an adjustment will be successful, wages will be positively related to insurer adjustment activity, *ceteris paribus*.

Compensation benefits also exert income and substitution effects, but because benefits represent transitory and uncertain income relative to wages, the substitution effect should dominate the income effect. Higher benefits should, therefore, increase the extent to which the claimant resists an insurer's claim adjustment and, as a result, decrease the probability of an adjustment.

Therefore, higher benefits should be positively related to potential cost savings but negatively related to the probability of a successful adjustment. Since adjustment probability is positively related to cost savings and negatively related to the probability of success, the net impact of benefits on adjustment probability is uncertain.

Three dummy variables measure the probability of a successful insurer adjustment. Claimants who do not speak English are likely to have fewer resources to pursue a compensation claim, so a dummy variable indicating that the claimant speaks English should be negatively related to adjustment probability.¹⁰ In addition, insurers investigate injuries that are reported to have occurred on Mondays more thoroughly than other injuries, since Monday injuries are more likely to be fraudulent (Webb et al., 1984). Thus, a dummy variable indicating that the injury was reported to have occurred on a Monday

⁸ In addition, survival models include a dummy variable indicating whether claimants were receiving benefits. This dummy variable controls for possible floor effects; since benefits cannot be reduced below zero, insurers are unlikely to adjust claims that pay no benefits. Squared wages are included to account for the fact that benefits are a nonlinear function of pre-injury wages.

⁹ I thank an anonymous referee for suggesting the analysis of claimant behavior presented in this section.

¹⁰ This variable may also reflect cultural differences in moral hazard propensities between English- and non-English-speaking claimants.

should be positively related to adjustment probability. Finally, insurers should be less likely to adjust claims of workers represented by counsel than unrepresented workers, since represented claimants are more likely to have benefits restored upon appeal.¹¹

The models also include dummy variables indicating that the State Insurance Fund, a public-sector self-insured employer, or a private-sector self-insured employer was liable for the claim. (The omitted category is private insurers.) Assuming that the State Fund and public-sector self-insured employers are insulated from market forces, dummy variables for these insurers should be negatively related to adjustment probability.

Finally, the models include dummy variables indicating claimant sex; marital status; body part injured, nature of injury, and whether the claim was filed with the New York City District Office of the Workers' Compensation Board.¹² Means and standard deviations of the variables are reported in Table 3.

Results

Probability of Controversion

The estimated probit equation for the probability that the insurer will initially controvert the claim only partially supports the economic theory presented earlier (see Table 4). Insurers are more likely to controvert the claims of single claimants, claimants represented by counsel, claims involving circulatory or respiratory problems, and claims involving occupational disease or internal injury than claims involving injury to back musculature. Although insurers are more likely to controvert Monday injury claims and the claims of workers who do not speak English, these relationships are not statistically significant. Similarly, there was no relationship between the probability of controversion and the claimant's sex, age, or pre-injury weekly wage. Claims filed by married claimants and claims processed by the New York City District Office of the Workers' Compensation Board were less likely to be controverted, but these relationships were not statistically significant.

Finally, while claims against the State Insurance Fund and self-insured employers are less likely to be controverted than claims against private insurers, the relationship is statistically significant only for the State Insurance Fund. This finding supports the notion that the State Fund is insulated from market forces. However, these results also may be explained by examining the nature of the State Fund's insureds. In general, the State Fund insures smaller

¹¹ On the other hand, both Thomason (1991) and Thomason and Burton (1993) found that claimants represented by counsel were more likely to settle and settled for smaller amounts than claimants without legal representation. It is possible that attorneys use insurer adjustments to induce claimants into accepting lump sum settlements. Attorneys may not vigorously oppose insurer interventions since those interventions encourage settlements. If so, we may expect no relationship or a negative relationship between adjustment probability and legal representation.

¹² The omitted category for body part included injuries to head, neck, trunk or spine; the omitted category for injury nature included occupational diseases and injuries to internal organs.



Table 3
Means and Standard Deviations of Dependent and Explanatory Variables

Variable	Controversion		Survival Prior to First Intervention	
	Mean	Standard Deviation	Mean	Standard Deviation
Pre-Injury Wage	181	80.3	170	78.4
Pre-Injury Wage Squared	39,112	40,963	35,142	38,152
Weekly Compensation Benefits	38.7	29.7	71.2	28.0
Receiving No Compensation Benefits	---	---	0.058	0.234
New York City ^a	0.512	0.500	0.513	0.500
Claimant Characteristics				
Age	46.1	12.0	45.6	12.7
Female	0.207	0.405	0.326	0.469
Married	0.843	0.364	0.810	0.392
Speaks English	0.929	0.258	0.932	0.251
Represented by Legal Counsel	0.652	0.477	0.447	0.497
Injury Characteristics				
Arm or Leg	0.082	0.274	0.091	0.288
Multiple Body Parts	0.230	0.421	0.248	0.432
Respiratory or Circulatory System	0.067	0.251	0.047	0.213
Back Musculature	0.506	0.500	0.505	0.500
Trauma	0.208	0.406	0.209	0.407
Sprain or Strain	0.422	0.494	0.440	0.497
Occurred on a Monday	0.193	0.395	0.181	0.385
Liability for Claim				
Apportioned Among Two or More Insurers				
More Insurers	0.146	0.353	0.028	0.166
State Insurance Fund	0.254	0.436	0.251	0.434
Private-Sector Self-Insured Employer	0.063	0.243	0.062	0.241
Public-Sector Self-Insured Employer	0.043	0.204	0.040	0.197
Claim Was Controverted	0.126	0.332	0.127	0.333
Days ^b	---	---	331	478
Censored		---		64
Total		881		844

^a Claim was filed in the New York City District Office of the Workers' Compensation Board.

^b Number of days between date of injury and initial insurer claims adjustment.

employers who, in many cases, are unable to obtain insurance with a private insurer. These employers are less able to provide the insurer with sufficient evidence to justify controversion of the claim.

The level of benefits is negatively related to claim controversion, and apportionment of liability among two or more insurers is positively related to controversion, indicating that insurers are less likely to controvert more costly claims. Although the apportionment result contradicts expectations, the benefit and wage results indicate that insurers are less likely to controvert claims where the probability of success (i.e., the probability that the adjustment will be upheld by the workers' compensation board) is small.

As indicated below, the results for claim survival more conclusively support an economic theory of claims adjustment. The weak results for controversion probability could be ascribed to two factors. First, since claims must be

Table 4
Probit Estimates of the Probability of Controversion

<i>Variable</i>		<i>Coefficients</i>	
Pre-Injury Wage	---	-0.185E-2 (0.88)	-0.167E-2 (0.77)
Pre-Injury Wage Squared	---	0.589E-5 (1.47)	0.680E-5** (1.65)
Weekly Compensation Benefits	-0.670E-2* (2.96)	---	-0.777E-2* (3.31)
New York City ^a	-0.407E-1 (0.30)	-0.118 (0.89)	-0.453E-1 (0.33)
<i>Claimant Characteristics</i>			
Age	0.608E-2 (1.25)	0.387E-2 (0.79)	0.773E-2 (1.50)
Female	-0.111 (0.66)	-0.526E-1 (0.30)	-0.669E-1 (0.38)
Married	-0.306*** (1.85)	-0.307*** (1.85)	-0.378** (2.26)
Speaks English	-0.247 (1.17)	-0.240 (1.05)	-0.333** (1.98)
Represented by Legal Counsel	-0.404* (3.19)	-0.371* (2.90)	-0.404* (3.08)
<i>Injury Characteristics</i>			
Arm or Leg	-0.682E-1 (0.24)	-0.151 (0.53)	-0.415E-1 (0.14)
Multiple Body Parts	-0.349 (1.50)	-0.365 (1.58)	-0.322 (1.36)
Respiratory or Circulatory System	1.57* (5.53)	1.49* (5.27)	1.56* (5.37)
Back Musculature	-0.592* (2.77)	-0.523** (2.43)	-0.559** (2.53)
Trauma	-0.871* (3.91)	-0.853* (3.87)	-0.851* (3.78)
Sprain or Strain	-0.346** (2.27)	-0.288*** (1.95)	-0.342** (2.24)
Occurred on a Monday	0.105 (0.67)	0.186 (1.22)	0.107 (0.68)
<i>Liability for Claim</i>			
State Insurance Fund	-0.229 (1.40)	-0.275*** (1.71)	-0.223 (1.34)
Private-Sector Self-Insured Employer	-0.118 (0.46)	-0.157 (0.60)	-0.138 (0.52)
Public-Sector Self-Insured Employer	-0.619E-1 (0.20)	-0.620E-1 (0.21)	-0.799E-1 (0.26)
Apportioned Among Two or More Insurers	0.370** (2.16)	---	0.359** (2.06)
Chi-Square	164.45	153.15	170.51

Note: Absolute t-ratios are in parentheses.

^a Claim was filed in the New York City District Office of the Workers' Compensation Board

* p < 0.01 ** p < 0.05 *** p < 0.10

controverted within 18 days of receipt, insurers lack complete information concerning the specifics of the claim. The information that they do have is typically second-hand from the employer. Second, and more importantly, the strict liability standard for workers' compensation makes it difficult to deny initial liability. The insurer must demonstrate the lack of a causal relation between employment and the claimant's injury or disease.

Duration before Initial Claims Adjustment

The equations estimating the length of time between the initial benefit payment and initial adjustment of the claim indicate that insurers will more quickly adjust the claims of workers who are most likely to abandon their claims (see Table 5). Most compelling are the results for the claimant's ability to speak English. Adjustment duration is shorter for non-English-speaking claimants than for English-speaking claimants, suggesting that insurers are more likely to adjust claims when there is a high probability of a successful adjustment (i.e., a reduction in benefits that is not reversed on appeal). More specifically, these results indicate that insurers are more likely to adjust claims filed by vulnerable claimants who lack the resources necessary to restore lost compensation benefits.¹³ This conclusion is supported mildly by the results for claimant legal counsel, which is positively related to claim survival, although this relationship is not statistically significant. The results for claimant's marital status are consistent with this interpretation if one assumes that married people are likely to have greater financial resources (and are therefore more resistant to insurer financial pressure) than single people.¹⁴

The results for apportionment of liability and claimant age support the notion that the greater the potential benefit savings, the quicker the insurer will be to adjust the claim. These results show that insurers adjust more quickly the claims of younger claimants than those of older claimants. This is consistent with insurer cost minimization, given that younger claimants will collect benefits for a longer period than older claimants. However, these results would also be obtained if older workers recovered more slowly from injury than younger workers. The results for apportionment are more convincing. The duration between the initial payment of benefits and an insurer-initiated reduction or suspension of benefits is longer for apportioned claims than for claims that have not been apportioned. Since apportioned claims offer smaller cost savings potential than nonapportioned claims, these results are consistent with the cost-minimization hypothesis.

The results for the wage and benefit variables also suggest that insurers are more likely to adjust claims where the probability of a successful adjustment is high. Claim survival is positively related to benefit levels and pre-injury

¹³ As noted above, this result may be explained equally well by differences in claimant proclivity to moral hazard. That is, non-English-speaking claimants may be more prone to delay a return to work than English-speaking claimants.

¹⁴ However, it is equally plausible that greater responsibilities would make married people *more* vulnerable to financial pressures.

Table 5
Hazard Rate Estimates
Duration Prior to First Intervention

<i>Variable</i>	<i>Weibull Distribution</i>	<i>Log-Logistic Model</i>	<i>Weibull Model with Gamma Mixing</i>
Pre-Injury Wage	0.161E-1* (8.30)	0.106E-1* (4.48)	0.959E-2* (3.87)
Pre-Injury Wage Squared	-0.266E-4* (8.76)	-0.186E-4* (4.53)	-0.170E-4* (3.78)
Weekly Compensation Benefits	-0.202E-2 (0.84)	0.592E-2*** (1.78)	0.745E-2** (2.15)
Receiving No Compensation Benefits	1.23* (4.02)	1.95* (6.15)	2.10* (6.55)
Claim Was Controverted	0.876* (4.24)	0.765* (4.06)	0.607* (3.28)
New York City ^a	-0.562E-1 (0.49)	-0.166 (1.50)	-0.162E-1 (1.51)
<i>Claimant Characteristics</i>			
Age	0.220E-1* (5.60)	0.214E-1* (5.47)	0.198E-1* (5.2)
Female	0.694* (5.82)	0.604* (4.97)	0.753* (3.65)
Married	0.403* (3.16)	0.303** (2.23)	0.287** (2.12)
Speaks English	1.16* (6.98)	0.844* (4.34)	0.753* (3.65)
Represented by Legal Counsel	0.166 (1.42)	0.656E-2 (0.05)	0.233E-1 (0.19)
<i>Injury Characteristics</i>			
Arm or Leg	0.673* (3.25)	0.710* (3.27)	0.724* (3.32)
Multiple Body Parts	0.762* (4.81)	0.758* (4.09)	0.759* (4.05)
Respiratory or Circulatory System	1.32* (3.59)	1.52* (4.25)	1.62* (4.62)
Back Musculature	1.16* (7.48)	1.04* (5.70)	1.01* (5.30)
Trauma	1.25* (7.79)	0.913* (5.42)	0.788* (4.69)
Sprain or Strain	-0.919E-1 (0.83)	-0.298* (2.44)	0.327* (2.75)
Occurred on a Monday	-0.254*** (1.70)	-0.925E-1 (0.678)	-0.800E-1 (0.62)
<i>Liability for Claim</i>			
Apportioned Among Two or More Insurers	1.07* (2.69)	1.74* (4.49)	1.83* (4.85)
State Insurance Fund	-0.528E-1 (0.45)	-0.323E-1 (0.26)	-0.265E-2 (0.02)
Private-Sector Self-Insured Employer	-0.147 (0.62)	-0.681E-1 (0.31)	0.688E-1 (0.33)
Public-Sector Self-Insured Employer	0.436 (1.35)	0.471*** (1.86)	0.385 (1.63)
SIGMA	1.50* (32.9)	0.832* (32.3)	1.70* (9.03)
THETA	---	---	0.666* (16.3)
Log-Likelihood Ratio	-5,285.4	-5,184.7	-5,176.0

Note: Absolute t-Ratios are in parentheses.

^a Claim was filed in the New York City District Office of the Workers' Compensation Board

* p < 0.01 ** p < 0.05 *** p < 0.10

wages. These results suggest that insurers are more likely to adjust claims where the probability is low that the claimant will contest the adjustment and where the probability is high that the workers' compensation board will uphold the adjustment.

Survival to adjustment is shortest for claims resulting from sprains and strains and longest for traumas. In part, these results could be explained by differences in the speed at which claimants may be expected to recover from different types of injuries. Durations are longer for claims involving the respiratory and circulatory systems and back musculature than for other type claims. Other results indicate that insurers are less likely to adjust claims filed by women.

Interestingly, all three models strongly indicate that claim survival is positively related to whether the claim was controverted by the insurer initially. Note that for these initially-controverted claims, the Workers' Compensation Board reversed the insurer's controversion decision. The Workers' Compensation Board may scrutinize insurer claims adjustment activity more closely once a claim has been controverted. In addition, there is some evidence indicating that the insurer will reduce or suspend benefits of Monday injury claims more quickly than other claims. While this evidence is tenuous, it suggests that doubts about initial liability affect insurer decisions concerning the extent of disability.

Finally, although the State Insurance Fund appears to be as quick to adjust claims as private insurers, public-sector self-insured employers are less likely than private insurers to adjust claims. While the latter result may reflect the fact that public-sector self-insureds are insulated from market forces, the former result is more difficult to explain. However, although the State Fund is not a profit-maximizing entity, it competes in the market for insureds with private insurers. Some other objective—such as cost minimization, in order to produce a positive account balance, combined with competition with private insurers—may induce the State Fund to adopt claims adjustment strategies similar to those employed by private insurers.

The coefficient for SIGMA is an estimate of the reciprocal of the parameter p , or $\sigma = 1/p$, so estimates of this coefficient in both Weibull distributions imply negative duration dependence. The value of 0.83218 in the log-logistic model means that duration dependence is positive up to $t = 55.51$ days and negative thereafter. Finally, the value of THETA in the Weibull/gamma model indicates that significant heterogeneity exists across claimants. Log-likelihood ratio tests revealed that both the Weibull model with gamma mixing and the log-logistic model were superior to the Weibull model without mixing. However, specification tests could not distinguish the Weibull/gamma from the log-logistic model.

Results from the Weibull/gamma specification imply that the probability of adjustment increases with time, while the log-logistic specification implies that the probability of adjustment first decreases (until the 55th day) and then increases (after 55 days). The apparent inconsistency between these results is resolved when the completed durations predicted by these models are

examined. The Weibull models indicate that the median duration is about 120 days, while the median duration predicted by the log-logistic model is about 160 days. These data indicate that, in most cases, the duration between the initiation of the claim and the insurer's adjustment is longer than 55 days.

Conclusion

Taken together, the results from the equations estimating the probability of controversion and survival until claims adjustment partially support the general economic model of insurer behavior advanced above. This economic model of claims adjustment stands in contrast to the medical-legal model that conceptually underlies workers' compensation programs. The medical-legal model conceives the process of claims adjustment as one where claim controversion is based on genuine doubts concerning the causal relationship between the injury and employment and where compensation is based on a medical evaluation of the extent of the claimant's disability.

The results presented in this article, however, demonstrate that decisions concerning both liability and compensation are partially based on economic considerations. In particular, these results suggest that insurers are more likely to adjust the claims of those most vulnerable to financial pressure: non-English speakers and claimants who are not represented by legal counsel. In addition, the finding that insurers are less likely to adjust claims where liability has been apportioned among two or more insurers indicates that claims adjustment behavior is motivated by the relative cost of claims.

On the other hand, contrary to expectations, the level of claimant benefits is negatively related to adjustment activity. This result, which was consistently found for all three claims adjustment measures, indicates that claimants are somehow able to influence the insurer's decision to intervene and that their influence dominates the insurer's response to increased benefits. In this respect, these results mirror those found by studies of claim frequency and severity; that is, higher benefits increase both the probability that a compensation claim will be initiated as well as the duration of disability. However, claims adjustment is more directly determined by the insurer rather than the claimant. It is difficult to imagine the precise mechanism through which this influence is brought to bear. A possible explanation is that claimants who receive relatively high benefits are more likely to resist adjustment efforts, and insurers, aware of this relationship, are less likely to intervene in their claims.

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