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Deterring Fraud: The Role of General Damage Awards in Automobile Insurance Settlements

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Abstract

Awards for pain and suffering and other non-economic losses account for over half of all damages awarded under third-party auto insurance bodily injury settlements. This paper hypothesizes that third-party insurers use general damage awards to reduce the incentive to submit exaggerated claims for specific damages for injuries and lost wages. Consistent with this hypothesis, the paper finds evidence using data on over 15,000 closed bodily injury claims that special damage claims that exceed their expected value receive proportionally lower general damage awards than claims that do not. Among the implications of this research is the possibility that insurers will be less zealous in challenging fraudulent special damage claims in a third-party insurance regime than they will in a first-party insurance regime.

1 Introduction

It is commonly argued that the treatment of nonpecuniary losses under the U.S. tort system yields general damage awards[1] that are both inefficient and inequitable.[2] The alarm sounded over general damages awards is in part attributable to the sheer size of these awards. Between 1985 and 1995 the median general damage award in jury cases awarding positive special damages for medical costs, personal property damage, lost wages, and other quantifiable damages came to $180,000 ($2001).[3] While the magnitude of general damage awards is clearly of concern to critics, the perception that these awards bear little relation to the actual damages suffered raises even greater alarm [ALI 1991]. The American Tort Reform Association (ATRA) argues, for example, "The broad and basically unguided discretion given juries in awarding damages for non-economic loss is the single greatest contributor to the inequities and inefficiencies of the tort liability system" [ATRA 2000, p. 19]. Concern over both the size and perceived inequities of general damage awards led thirteen state legislatures between 1986 and 1997 to place statutory caps on these awards.

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[1] According to the American Law Institute, general damages encompass the following: (1) tangible physiological pain suffered by the victim at the time of injury and during recuperation, a period that may be lengthy but that is more often brief; (2) the anguish and terror felt in the face of impending injury or death, both before and after an accident; (3) the immediate emotional distress and long-term loss of love and companionship resulting from the injury or death of a close family member; (4) the enduring loss of enjoyment of life by the accident victim who is denied the pleasures of normal personal and social activities because of his permanent physical impairment [ALI 1991].

[2] See, for example, Shavell (1987) for a discussion of the economic efficiency of general damage awards.

[3] Author's calculation using the RAND Civil Jury Database.

This paper addresses the role general damage awards play in the settlement of third-party insurance claims for bodily injuries sustained in auto accidents.[4] Disputes arising over liability for and the extent and apportionment of damages incurred in automobile accidents represent nearly half of all civil cases tried to verdict in the United States [BJS 2000]. The vast majority of suits for damages incurred in automobile accidents are settled routinely out-of-court by insurance companies, however. In 1997, awards for general damages accounted for 57 percent of total paid claims under third-party bodily injury (BI) insurance.

It is a matter of popular lore that general damages should amount to some rough multiple of compensation for specific economic harms (special damages) [Ross 1980]. While this may be true of initial offers proffered by either side, evidence from actual settlements and court decisions clearly indicates otherwise. General damage awards vary enormously conditional on a given level of special damages and, while general and special damages are positively correlated, the relationship is not linear. In the closed claim data used in this paper, the unconditional elasticity of general damages with respect to special damages is 0.76. This paper argues that the inelastic relationship between general and special damages in auto insurance awards does not reflect society's belief that pain and suffering and other non-economic losses actually do increase less than proportionally with special damages, but rather emerges as the solution to a principal-agent problem between insurers and claimants in which claimants possess private and hidden information about the true extent of their injuries.

Claim exaggeration and outright fraud is legendary in auto insurance. The difficulty inherent in diagnosing the severity of the types of injuries typically suffered in automobile accidents — soft-tissue injuries or "sprains and strains" — makes fraud and buildup relatively inexpensive to perpetrate and costly to deter. By one estimate, 36 percent of all bodily injury claims are thought to involve fraud or buildup, inflating the cost of auto insurance by between 17 and 20 percent, or $5.2-$6.3 billion in 1996 [IRC 1996]. Carroll and Abrahamse (2001) estimate that 42 percent of reported soft-tissue injuries are for non-existent or preexisting injuries. In an earlier study, Carroll et al. (1995) put the cost of automobile

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[4] The adoption of no-fault auto insurance in 16 states in the early 1970s limiting access to general damages was also partly attributable to concerns over perceived inequities in the award of general damages. See, for example, O'Connell (1971).

insurance fraud at between \$9 and \$13 billion in 1995, which they estimate cost the typical policyholder between \$100 and \$130 annually.

Insurers have two basic strategies at their disposal for deterring fraud. One strategy is to conduct detailed audits of suspicious claims and challenge those for which they find sufficient evidence of fraud. The expected value of this strategy, however, may be low since audits are expensive to conduct, many injuries are inherently difficult to objectively diagnose, and the cost of challenging a claim in court is high. A second strategy available to insurers is to design an indemnity schedule that diminishes the incentive to commit fraud. In the case of first-party insurance, it has been shown that an optimal insurance contract in the presence of asymmetric information and costly state falsification entails an indemnification schedule that is less responsive to damages claimed than would be the case were falsification not possible [Crocker and Morgan 1998]. That is, in a setting in which, at a cost, claimants can inflate the value of their claim, and insurers have no ability to observe the true value of the claim, insurers may underindemnify large claims in order to create a disincentive to engage in claim falsification. Crocker and Tennyson (2002) demonstrate that insurers have similar incentives to "flatten" the indemnification schedule in the third-party setting of BI liability insurance.

This paper departs from the prior literature by considering how insurers can effect a flattened indemnification schedule via general damage awards when systematically underindemnifying special damages in a third-party setting is infeasible. Unlike first party insurance, insurers cannot offer a third-party insurance contract that offers less than full reimbursement for documented medical costs, lost wages, and other specific economic damages, since the insured party is fully liable for damages (policy limits not withstanding). General damages, however, which are inherently difficult to quantify and consequently highly negotiable, offer a means for insurers to create disincentives to engage in claim falsification by systematically underindemnifying *total* (special plus general) damages.

The remainder of the paper has the following structure. I first describe the closed-claims data employed in this paper and present evidence on the observed relationship between general and special damages in Section 2. In Section 3, I then develop a simple model of the claims settlement process con-

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sistent with the costly state verification model of Crocker and Morgan (1998) and Crocker and Tennyson (2002). I then show that within-injury patterns in the ratio of general to special damages are consistent with this characterization of the claims settlement process (Section 4). The paper concludes in Section 5 with a discussion of trends in general damages awards between 1987 and 1997 and implications of these finding for policies that aim to limit general damage awards.

2 The IRC Closed-Claim Data

The data for this paper come from a sample of 44,276 closed BI claims collected by the Insurance Research Council (IRC).[5] The sample represents a census of all auto claims closed by participating insurance companies over a two-week period in 1997. The participating insurance companies represented 67 percent of the auto insurance market in 1997. The IRC data contain detailed information about accident circumstance, claimed injuries, settlement amounts, and demographic information about the claimants.

I impose a number of restrictions on this sample of claims in order to focus the analysis on the typical, "bread-and-butter," BI case (see Table 1). First, I restrict the sample to claims in which an injury was reported and known to the insurer, the injury did not result in a fatality or permanent disability, and the injury was not of an unusually severe variety (permanent brain injury, loss of body part, paralysis, temporomandibular joint dysfunction, or loss of taste, smell, sight, touch, or hearing). These restrictions are intended to exclude unusually severe and rare injuries which, consequently, may receive unusual general damage awards. I then drop BI claims filed in the thirteen states that in 1997 offered no-fault auto insurance in which claimants collect primarily from their own insurance regardless of fault. No-fault insurance prohibits claimants from suing for general damages unless special damages exceed some verbal or dollar threshold.[6] I further restrict the sample to claimants not at fault for the

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[5]The IRC was formerly known as the All-Industry Research Advisory Council (AIRAC). See IRC (1999) for more detail on the closed-claim data.

[6]In 1997, the strict no-fault states included Colorado, Florida, Hawaii, Kansas, Massachusetts, Michigan, Minnesota, New York, North Dakota, and Utah. Kentucky, Pennsylvania, and New Jersey offered so-called choice auto insurance in which drivers can choose between first and third-party coverage.

accident since it is unclear how adjusters use that information to adjust damage awards in the IRC data. Moreover, conditional on the claimant having any fault, degree of fault may be part of the overall settlement negotiation. Claims that go to trial are rare — one percent of all claims — and may entail unusual damage assessments; these claims are dropped from the sample. Altogether, these restrictions eliminate 51 percent of the original sample with the largest reductions attributable to focusing on tort claims in which the claimant is not at fault.[7]

An important feature of the IRC data is its apportionment of total damages paid and claimed into special and general damages. Roughly one quarter of the remaining claims record either zero special damages or zero general damages.[8] I choose to drop these claims for reasons discussed in Section 4. In order to remove outliers, I rank claims by the ratio of general to special damages (GS_Rat) and trim the top and bottom one percent.[9] The final sample contains 15,373 claims.

To illustrate the large variation in general damages conditional on special damages in the closed-claim data, I plot GS_Rat against special damages claimed in Figure 1.[10] It is clear from Figure 1 that general damages decrease as a proportion of special damages paid as special damages paid increase. It is also clear from the figure that claims with similar levels of special damages paid receive a wide range of general damage payments. It is these two stylized facts that this research seeks to explain.

Table 2 tabulates GS_Rat across deciles of the special damages distribution. In the bottom decile of claims where mean special damages are \$120, mean GS_Rat equals 4.06. This ratio falls by nearly half to 2.21 in the second decile where mean special damages total \$320. The ratio falls again to 1.75 in the third decile and declines at a slower rate thereafter. In the tenth decile (mean special damages=\$10,160), mean GS_Rat is 1.23. A similar pattern is evident if we look at medians in the final two columns of Table 2, although median GS_Rat in the bottom decile is only 3.09. Once again, though, GS_Rat falls by almost half to 1.69 in the second decile and then continues to decline reaching 1.00 in the top decile of the special damages distribution. By either measure, it is clear that general damages account for a

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[7]5,381 claims are lost due to missing data on degree of fault.
[8]967 claims have both missing special and general damages.
[9]Before trimming, the largest GS_Rat is 405.4 and the smallest 0.0001. After trimming, GS_Rat ranges from 0.08 to 16.30.
[10]For purposes of presentation, I drop the top one percent of special damage claims ($> \$17,457$).

declining fraction of total settlements as total settlements increase. In the remainder of the analyses, I report median ratios.

In Table 3, I consider a number of simple explanations for the observed pattern in GS_Rat. One possible explanation is that policy limits constrain general damage awards in the more extreme cases. Consider, for example, a claimant who sustains an injury entailing \$6,000 in special damages and whose policy limit is \$10,000. General damages paid by the insurer at most could total \$4,000 in this case. An individual sustaining a less serious injury could exact a proportionally more generous general damage award since the policy limit would be less binding. In practice, though, policy limits are not binding in the vast majority of cases. Over 80 percent of all claimants in this sample have single policy limits of at least \$25,000; 58 percent of policy limits exceed \$50,000. In the second column of Table 3, I drop all observations in which the claimant's policy limits are not at least four times as large as his or her special damages. This sample restriction has little effect on the pattern of GS_Rat. As before, the ratio declines with increases in special damages.

While we might expect general damages to increase with medical costs, it is less clear that they should increase with lost wages. Medical costs might reasonably proxy for pain and suffering whereas lost wages capture other characteristics of the claimant less correlated with pain suffering.[11] If this is true and lost wages increase more than proportionally with medical costs, then we might observe general damages falling as a fraction of special damages as special damages rise. The trouble with this explanation is that lost wages increase much more slowly than do medical costs (the elasticity of lost wages with respect to medical costs is 0.53). Moreover, I show in Column 3 of Table 3 that GS_Rat follows the same pattern as before when specified as the ratio of general damages to medical costs, thus removing the potentially confounding effect of lost wages.

Yet another reason why we might observe GS_Rat declining with special damages is the possibility that general damage awards pay attorney costs and attorney costs tend to decline as a proportion of the

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[11]For example, the U.S. government announced in December 2001 that the September 11 Victim Compensation Fund would offer a fixed settlement for pain and suffering and other non-economic losses of \$250,000 for victims of the World Trade Center bombings plus \$50,000 for a surviving spouse and each minor child. The amount awarded for general damages will not vary by estimated lost wages (*New York Times*, December 21, 2001, p. B6).

total award as the award increases. As a quick check of this hypothesis, I restrict the sample in the next to last column of Table 3 to claimants not represented by an attorney (53 percent of the total sample). As can be seen, GS_Rat continues to decline with special damages in the non-attorney sample.

The most straightforward explanation for why the ratio of general to special damages declines with special damages may be that pain and suffering is simply not proportionally related to injury costs. More expensive injuries do not necessarily entail proportionally more pain and suffering than less expensive injuries. As we shall see, however, a model of the claims settlement process pu forth in the following section, and the empirical analyses of Section 4, suggest an alternative explanation.

3 Claims Falsification and the Claims Settlement Process

Claims falsification is thought to be a particularly acute problem in auto insurance. By claim falsification, I mean the exaggeration of special damages beyond their true value following a real accident.[12] Claim falsification can be divided into two categories, fraud and buildup. I define fraud as the explicit collusion between claimant and a medical service-provider to make claims for non-existent injuries and treatments. Buildup, on the other hand, involves the intentional exaggeration of real injuries in order to maximize special and general damage awards. This may commonly involve pursuing excessive treatment for real injuries. From a legal perspective, both fraud and buildup as defined are fraudulent since they involve deliberate deception on the part of the claimant. From an insurer's perspective, however, buildup is a softer, more difficult to prove, and more common form of fraud [IRC 1996].

There are at least three studies of the extent of claim falsification in auto insurance claims. The Florida Insurance Research Center estimated that 13 percent of Florida PIP claims are suspected of some form of claim falsification [IRC 1993]. A similar study by the Automobile Insurers Bureau of Massachusetts found that 9 percent of Massachusetts PIP claims were strongly suspicious and 20 percent were moderately suspicious [Derrig and Weisberg 1995]. The most comprehensive study of claim falsification for automobile injuries was conducted by the Insurance Research Council (IRC) using their

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[12]I do not consider fraud involving staged-accidents and the like.

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1992 closed-claim data. Senior claims personnel in 28 insurance companies reviewed 12,212 BI and 3,007 PIP claims in nine states and reported their level of suspicion regarding claim falsification in each claim. Overall, 36 percent of these claims displayed some evidence of falsification. The claims personnel suspected 20 percent of BI claims involved buildup only, 13 percent fraud and buildup, and 3 percent fraud only. These percentages were somewhat lower for PIP claims [IRC 1996].[13]

There are two basic methods by which an auto insurer can reduce the prevalence of fraudulent claiming. The first method is ex-post monitoring and verification of claims.[14] Insurers investigate the validity of special damage claims by contacting doctors, performing their own medical exams, verifying wage rates and work absences, and conducting other research. Ex-post monitoring is costly and uncertain, however, and apparently relatively rare in third-party auto insurance. In only two percent of our closed-claim sample, for example, did the insurer request an independent medical exam to verify injury claims; in fewer than one-third of claims did the insurer audit submitted medical bills. Challenging an auto insurance claim in court is perhaps the most extreme example of ex-post verification, the cost of which is so high to both the insured and insurer that it is very rare for an auto claim to be settled in court, especially those in which fault or liability is not in question. Claimants formally filed suit in only 16 percent of the IRC auto claims and only one percent of those suits were actually tried in court.

A separate approach to deterring fraud is known in the economics literature as costly state falsification. In this environment, it is assumed that claimants can, at a cost, permanently conceal the magnitude of their actual loss from the insurer. Such costs might include the expected cost of any penalties associated with being found guilty of fraud as well as costs associated with defending the proposed damage amount like obtaining fraudulent receipts for medical treatment, hiring a lawyer, and building a case for expected costs incurred in future periods (e.g., future medical bills and lost wages). Under the assumption that

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[13]A substantial fraction of consumers themselves apparently believe claim falsification is justifiable. Tennyson (1997) reports that about 20 percent of automobile insurance consumers agreed at least somewhat with the statements "It is all right to increase a claim by a small amount to make up for the deductible" and "It is all right to increase a claim by a small amount to make up for past premiums."

[14]In the economics literature, this strategy has been referred to as costly state verification and was originally analyzed by Townsend (1979). Bond and Crocker (1997) derive conditions for an optimal first-party insurance contract when insurers can verify actual loss at a cost and insured parties may engage in evasive activities that increase the costs of verification. They demonstrate that the optimal insurance contract in this environment overindemnifies easily monitored losses and underindemnifies claims exhibiting higher verification costs.

the cost of concealing the actual loss is increasing in the level of fraud perpetrated, Crocker and Morgan (1998) show that the solution to the principal agent problem entails an optimal insurance contract that overindemnifies small losses and underindemnifies large losses. A completely flat indemnification schedule, of course, would eliminate any incentive to engage in fraud. The optimal contract, then, lowers the incentive to engage in fraud at the cost of less consumption smoothing for the risk-averse insured.

In a third-party insurance environment, it is reasonable to assume that insurers cannot, without cause, underpay claimed damages since the insured party, if 100 percent at fault, is legally liable for all damages incurred. The third party insurer cannot simply state *a priori* that they will systematically underindemnify large losses. Insurers can, however, underpay claims if they are willing to accept exposure to extracontractual liability, consequential, and punitive damages and additional legal costs associated with defending the settlement in court. Thus, the optimal insurance contract in the third-party insurance environment trades-off the benefits of reducing the claimant's incentive to falsify claims with the legal and adminstrative costs associated with claims underpayment.

Crocker and Tennyson (2002) formalize this trade-off with the following model, which I sketch here in order to highlight how insurers can use general damages to achieve the optimal insurance contract. Claimants possess private information about special damages they sustain in auto accidents, x. At a cost of $\xi(x-y)^2$, a claimant can claim special damages, s, that exceed their actual value $(s \geq x)$. Claimants will receive indemnification according to some schedule $T(s)$. Claimants seek to maximize uitlity in the post-accident state choosing s:

$$\max_s U(W - x + T(s) - \xi(x-s)^2) \tag{1}$$

which yields the intuitively appealing first order condition that claimants make special damage claims so that the marginal benefit of inflating claims equals the marginal cost of this falsification.

$$T'(s) = 2\xi(x-s) \qquad \Rightarrow \qquad s = x + \frac{T'(s)}{2\xi} \tag{2}$$

We can think of $T(s)$ as being composed of indemnification for special damages, $S(s)$, and indemnification for general damages, $G(s)$. Let us assume a linear indemnification schedule as in Crocker and Tennyson (2002):[15]

$$
\begin{aligned}
T(\alpha, \beta, \delta, \gamma, s) &= S(s) + G(s) \\
S(s) &= (1-\beta)\alpha + \beta s \\
G(s) &= (1-\gamma)\delta + \gamma s
\end{aligned}
\tag{3}
$$

Insurers choose the parameters of $S(s)$ and $G(s)$ in order to minimize the cost of indemnification and any costs associated with underpaying claims, $c(s - S(s))$ and $d(g - G(s))$, where g is general damages claimed and we assume these cost functions are increasing for values of $s > S(s)$ and $g > G(s)$ and equal to zero otherwise (i.e., there are no legal or adminstrative costs associated with overpaying claims). Formally, the insurer's problem can be characterized as follows:

$$
\min_{\alpha, \beta, \delta, \gamma} \int_0^\infty T(\alpha, \beta, \delta, \gamma, s) + \int_{\overline{s}}^\infty [c(s - S(s)) + d(g - G(s))] f(x) dx
\tag{4}
$$

s.t. Equation 1.

where $f(x)$ is the known probability distribution of actual losses, x and $[\overline{s}, \infty]$ is the range of x which results in claims underpayment. Crocker and Tennyson (2002) go on to calculate first order conditions with respect to α and β (they do not distinguish between special and general damages in their model) and derive comparative static results with respect to the claim falsification parameter, ξ.

The point of departure for this paper is the assumption that insurers employ separate indemnification

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[15]See Crocker and Morgan (1998) for a more general solution to the costly-state falsification problem that permits nonlinear indemnification schedules.

schedules for special and general damages and that underpaying special damages is far more costly than underpaying general damages $(c(.) > d(.), \forall s - S(s) = g - G(s))$. The later assumption is justified by the fact claimants can easily marshall evidence that they incurred special damages by showing receipts for medical services rendered and, perhaps less easily, demonstrating that their injuries resulted in lost wages. In order to challenge those costs, insurers must argue that either the receipts are fraudulent or the services rendered excessive. On the other hand, general damages, for which there is no generally accepted objective method for quantifying, are inherently unverifiable. Consequently, general damages may be far more negotiable than special damages and the legal consequences of underpaying general damages potentially less severe.

The IRC data provide evidence that, in fact, special damages may be relatively costly to challenge. Special damages claimed equal special damages paid in 80 percent of all claims with positive special damages claimed and paid (Table 4, Panel A). In 15 percent of cases, special damages paid are less than special damages claimed. In two percent of claims special damages are overpaid.[16] The distribution is similar if we compare medical expenses paid and claimed, wages loss paid and claimed, and other expenses paid and claimed. For claims in which special damages paid are less than special damages claimed, the closed-claim survey asks insurers to indicate why. In 28 percent of these cases insurers indicated that they had disallowed particular costs. Other factors like coordination with another insurance policy, liability compromise, and policy limits were cited as reasons for why the insurer paid less than the claimed amount for special damages in the remaining 72 percent of cases. Thus, it would appear that in only 4 percent of all claims did the insurer successfully challenge claimed costs on the basis of the appropriateness of the claimed treatment.[17] In these cases, special damages paid averaged 67 percent of special damages claimed. The IRC data do not record general damages claimed, and so a direct comparison between claimed and paid general damages is not possible. The very fact that general damages claimed are not recorded, however, suggests that these damages are indeed the primary focus of settlement negotiations.

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[16]If I include claims in which no special damages were paid, but positive special damages claimed, these percentages change to 16 and 4 percent, respectively.

[17]This analysis assumes that adjusters who complete the IRC data forms do not engage in any ex-post justification of settlement amounts by adjusting special damages claimed to equal special damages paid. It is unclear why adjusters would do this on an anonymous survey form, but the possibility cannot be ruled out.

It is interesting to note that underpayment of special damage claims is much more common in no-fault states where access to general damages is limited. The 1997 IRC data on closed personal injury protection (PIP) claims indicates that medical damages claimed exceed medical damages paid in 60 percent of all claims (Table 4, Panel B).[18] In 20 percent of these cases, insurers indicated that they had disallowed particular expenses. The primary reason for claim underpayment in no-fault states, however, is the existence of medical fee schedules and, in some states, the explicit statutory provision that claimed wages and medical damages not be compensated 100 percent. These provisions are aimed at counteracting ex-post moral hazard in a first party insurance system with low deductibles and very high policy limits. We return to this point in our concluding section.

Although unnecessary for the theoretical implications of this model derived below, it is worth noting that it makes sense to think of claimants maximizing general damages paid rather than maximizing special damages paid. It is a widely held belief that the primary motivation claimants have to inflate special damage claims is to leverage higher general damage awards [Ross 1980; Carroll and Abrahamse 2001; Derrig and Weisberg 1994]. Absent gross fraud in which a claimant obtains false receipts for services not rendered, payments for special damages cover actual expenses. Medical costs represent 86 percent of total special damages paid in the IRC data and inflating medical payments makes little sense if those payments cover real expenses and the insured does not have some perverse taste for unnecessary medical procedures. A similar, although weaker, argument can be made in the case of wage loss payments to the extent that these payments compensate individuals for actual time away from work and individuals are not using these payments to finance leisure.[19]

In terms of our model, this suggests that while claimants can inflate claims so that $s > x$, this inflation is not beneficial in itself; that is, claimants cannot appropriate positive differences between s and x absent gross fraud. Payments for general damages, on the other hand, can be used to finance consumption in general. Maximizing post-accident consumption makes sense regardless of what level of pain and suffering a claimant actually experiences. Consequently, it would seem that not only is it less

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[18]This sample of PIP claims is subject to the same restrictions as the sample of BI claims (see Section 2 for details).

[19]Median wage loss payments come to \$425 in the 30 percent of claims with positive wage loss claims. Thus, wage loss payments would finance, at best, a rather short vacation.

costly for the insurer to "flatten" the indemnification schedule via general damages, but that the main reason claimants have to inflate special damages in the first place is to achieve higher general damage awards.

The slopes of the indemnification schedules $S(s)$ and $G(s)$ are governed by the insurer's choice of parameters β and γ conditional on the claimant's falsification costs and the insurers expected cost of underindemnification (i.e., the simultaneous solution to Equation 4). Assuming quadratic cost functions, $c(.) = c(s - S(s))^2$ and $d(.) = d(g - G(s))^2$, we can show that the insurer's optimal choices of β and γ are declining in the cost parameters c and d (i.e., $\partial\beta^*/\partial c > 0$ and $\partial\gamma^*/\partial d > 0$).[20] Moreover, if we assume $c > d$, then the insurer will choose $\gamma^* < \beta^*$. I depict this in Figure in which I assume claimants claim general damages that are a constant fraction of special damages.

Now let us consider how the claims settlement process could work in practice. A claimant sustains some set of injuries, Ω, in an automobile accident and reports this information to the insurer before making any specific damage claim. It is common practice (and legally required in many states) for the insurer to set aside a reserve that reflects the insurer's expectation of the total settlement, $\hat{T} = \hat{s}(\Omega) + G(\hat{s}; \Omega)$, where $\hat{s}$ is expected special damages. This expectation, or reserve, while not immutable, becomes the focal point for the insurer's subsequent settlement negotiations with the claimant. The question then is, how does the insurer incorporate claimed damages, s, when that information arrives? One possibility is that the insurer pays s (which happens in 91 percent of the IRC closed claims), but then adjusts G to hold $\hat{T}$ constant (assuming $s < \hat{T}$). That is, general damages paid are simply the difference between the insurer's expectation of the total claim value and special damages claimed.[21] Such a strategy effectively assumes that the cost of underpaying general damages is very low and the cost of underpaying special damages is very high.

Presumably, insurers are not free to adjust general damage awards without consequence, however.

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[20]The proof of these comparative static results is parallel to the proof of $\partial\beta^*/\partial\xi > 0$ in Crocker and Tennyson (2002). The proof is available from the author upon request.

[21]It is worth noting that in the IRC data, 62 percent of total damage awards are bunched at increments of $100 whereas only 8 percent of special damage awards and 22 percent of general damage awards occur in such increments. This suggests that insurers and claimants agree on total damages first, and since special damages are itemized, general damages are then just mechanically the difference between the total settlement amount and special damages claimed.

Claimants do have some expectation of general damages and the insurer could face legal challenges if it offers general damages too far below the claimant's expectation (i.e., $d(.) > 0, \forall g > G$). Consequently, the insurer may choose an indemnification schedule that pays expected general damages, $G(\hat{s}; \Omega)$, plus some fraction of claimed special damages:

$$T(\delta, \gamma, s) = s + G(\hat{s}; \Omega) + \gamma s \tag{5}$$

This indemnification schedule assumes insurers choose $\beta = 1$. Now, if insurers choose $\gamma = 0$, we have a model in which general damages paid are simply the difference between expected total damages, $\hat{T}$, and special damages claimed. $\gamma^* = 0$ is an unlikely outcome, however. Indeed, Crocker and Tennyson (2002) prove that it will never be optimal for insurers to choose $\gamma = 0$ so long as legal and adminstrative costs of claim underpayment are positive ($d(.) > 0$). Moreover, so long as falsification costs are less than infinity ($\xi < \infty$), insurers will choose $\gamma^* < 1$, and claimants will have an incentive to falsify claims.

Consider now what this model implies for how the ratio of general to special damages will change as special damages claimed increase. If $S(s)$ takes the form in Equation 3 and $G(s) = G(\hat{s}; \Omega) + \gamma s$, it is trivial to show that

$$\frac{\partial G/S}{\partial s} = \frac{\alpha\gamma(1 - \beta) - \beta G(\hat{s})}{S^2} \tag{6}$$

which implies that the ratio of general to special damages will decrease as specials increase so long as

$$G(\hat{s}) > \frac{\alpha\gamma(1 - \beta)}{\beta} \tag{7}$$

This inequality is likely to hold so long as β is sufficiently greater than zero. We can provide additional interpretation to the condition in Equation 7 by noting that $s = \hat{s} + \epsilon$. Again, assuming β is sufficiently greater that zero, the ratio of general to special damages will decrease as ϵ increases. That is, insurers pay out proportionally lower general damage awards to claimants whose claimed special damages exceed

their expected value.[22]

Insurers face potentially high costs in explicitly underindemnifying third-party claims since, in princi-
ple, the insured party is strictly liable for damages incurred by the third party. The existence of general
damages, however, offers insurers a means for accomplishing this underindemnification. There is no set
method for quantifying general damages and so the cost of underindemnifying these losses is likely to
be far lower than the cost of underindemnifying special damages. In effect, general damages offer a
mechanism by which third-party insurers can offer the first-party optimal insurance contract described
by Crocker and Morgan (1998). The implication of this characterization of the claims settlement process
is that we should expect insurers to pay proportionally lower general damages to claimants who demand
special damages that exceed their expected value. We now turn to an empirical investigation of this
implication.

4   Within Injury Variation in GS_Rat

The model of the claims settlement process outlined in Section 3 above has a clear testable implication;
namely, GS_Rat should respond negatively to differences between claimed and expected special damages.
Testing this implication of the model requires a measure of this deviation, $\epsilon = s - \hat{s}$. Empirically,
we can recover $\hat{\epsilon}$ from a regression of claimed special damages on injury characteristics and accident
circumstances:

$$s_i = \Omega_i \alpha + \epsilon_i^R \tag{8}$$

$$\hat{\epsilon}_i^R = s_i - \hat{s}_i$$

where, Ω_i is a vector of injury, demographic, and claim characteristics. The trouble with this approach,
however, is that $\hat{\epsilon}_i^R$ represents the expected claim value from the researcher's perspective and this may

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[22]The second derivative of GS_Rat with respect to s is positive indicating that GS_Rat declines at decreasing rate.

differ from the insurer's expected claim value, $\hat{\epsilon}_i^I$, to the extent that the insurer uses information not available in the IRC data.

That $\hat{\epsilon}_i^R$ and $\hat{\epsilon}_i^I$ differ seems likely. The insurer undoubtedly possesses more information about the extent of the claimant's injuries and their need for treatment and consequences for lost work than is available in the IRC data. The IRC data do provide a great deal of information about the types of injuries suffered, including International Classification of Diseases (ICD-9) codes, but injury severity is much less easily measured. The most objective measures of severity in the IRC data include variables like the severity of the injury as observed at the accident scene according to police reports or witnesses, visual damage to the insured's automobile, the insured's position in (or out of) the vehicle, and whether the insured was wearing a seatbelt. More subjective measures of injury severity, in the sense that they may capture post-accident discretionary choices by the insured, include extent of hospital treatment, number of visits to medical practitioners and diagnostic tests performed, number of days unable to perform normal work duties, and whether the injury resulted in a temporary disability.

We could test for a negative correlation between $\hat{\epsilon}_i^R$ and general damages in a regression framework (e.g., $G_i = \beta_i s_i + \delta_i \hat{\epsilon}_i^R + \nu_i$) but that estimated correlation is difficult to interpret given that $\hat{\epsilon}_i^R$ is mean zero by definition and its variance depends on the overall fit of the regression in Equation 8. The magnitude of $\hat{\delta}$ depends on how well we can measure Ω. Mechanically, $\hat{\delta}$ will decline in magnitude as we limit Ω.[23]

An alternative, less parametric approach, involves investigating how GS_Rat varies with special damages within categories of injuries. Remember, the model of Section 3 suggests insurers first form some expectation of claim value given Ω. They then offer to pay expected general damages, $G(\hat{s}; \Omega)$, plus some fraction of special damages claimed. It should be the case, then, that GS_Rat declines within claim types as defined by some set of characterisitcs, Ω. It is the within injury distribution of special damages that governs GS_Rat, not the overall special damages distribution.

When setting the initial reserve, the adjuster is likely to possess information about the type of injuries

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[23]Ideally, we might proxy ϵ with a measure of the adjuster's level of suspicion about the claim. IRC (1996) uses closed-claim data that contains such a measure. Unfortunately, IRC cannot publicly release these data.

sustained (e.g., neck sprain, concussion, laceration) in the accident and some measure of how serious those injuries are (e.g., did the claimant go to the emergency room, how badly damaged was the vehicle). Consequently, we first divide the IRC sample by most serious injury sustained (as judged by the adjuster). These injury categories are as follows: minor burns, lacerations, contusions; serious laceration, scarring or permanent disfigurement; neck sprain or strain; back sprain or strain; other sprain or strain; knee or shoulder injury; disc injury; fracture; internal organ injury; concussion; and psychological, emotional injury. We then divide the sample by injury severity. We classify an injury as severe if the claimant received more than emergency room care at a hospital (two percent of claims), experienced a temporary disability (22 percent of claims), was unable to perform normal activities for more than 9 days (19 percent of claims), the claimant sustained three or more separate injuries (11 percent of claims), or the passenger compartment of the claimant's automobile was compromised (21 percent of claims); 45 percent of the sample claims are defined as severe by this definition.

Before presenting the main empirical results of the paper, it is worth examining the characteristics of the biggest outliers in the original sample; namely, those claims with either zero special damages, but positive general damages paid, or claims with zero general damages, but positive special damages paid (see Table 1). Claims in which no special damages were paid are difficult to understand. These claims take longer to close (4.2 months longer than all claims on average) and were less likely to involve an attorney (25 v. 48 percent for all claims). They are similar to all claims in terms of injury sustained, although they are less likely to be severe by the above definition (27 v. 45 percent for all claims). In about 40 percent of these cases, claimants claimed special damages. Median claimed special damages, conditional on claiming any special damages, total $1,720, compared to $1,514 for all claims. Median general damages paid in this sample are far less than in all cases — $500 compared to $1,680.

The data do not offer any explanation for why special damages were not paid in these claims, or why in 60 percent of these claims, no special damages were even claimed. These claims had sufficiently high policy limits and insurers were actually less likely to audit these claims than claims in which they did pay special damages. One possible explanation is that another insurance policy paid the claim, but the

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claimant still recovered general damages from the third-party insurer.

Claims in which no general damages are paid are also difficult to understand. These claims look similar to all claims in terms of injury type, although they are less likely to be severe (33 v. 45 percent). Median special damages paid in these claims total $890 compared to $1,431 for all claims. These claims are also more likely to receive special damages that are more or less than their claimed value (26 underpaid, 54 percent paid in full, and 20 percent overpaid). These claims were somewhat less likely to be represented by an attorney (35 v. 48 percent). Again, the data offer no explanation for why insurers did not award general damages in these claims. It could simply be that the claimants themselves did not seek general damages.

As stated in Section 2, I drop these claims from the sample despite their significant numbers. I do this under the assumption that these claims are anomalous either because the claimants recovered special damages from another source or, in the case of no general damages paid, because claimants did not seek general damages. I admit, though, I have no evidence that this in fact explains why some claims recieve no special damages and others receive no general damages. I now turn to the main analysis using the sample as described in Table 1.

Table 5 shows GS_Rat by special damages quintile and most serious injury sustained, where the special damages quintile is generated within injury type. The first thing to note is that GS_Rat declines as special damages rise within all injury classes reported in Table 5, although in a few cases with small sample sizes, the decline is not monotonic. The second notable aspect of Table 5 is that GS_Rat is remarkably consistent across injury types despite their different average costs. For example, the median special damage award for burn and minor laceration claims in the first quintile is $100 contrasted with a median special damage award for disc injury claims in the first quintile of $2,060. Despite the large difference in median special damage awards, GS_Rat is quite similar in the two injury categories (3.18 v. 2.78). Similarly, median GS_Rat in the fifth quintile of special damage awards in sprain and knee/shoulder injury claims is 1.04 and 1.05, respectively, despite large differences in median special damages ($4,192 v. $9,420). Nonetheless, it is apparent from the table that certain injuries — disfigurement and psychological

injury most clearly — command proportionally higher general damages at all levels of special damages incurred. These injuries may indeed entail greater pain and suffering.

In Table 6, we show how GS_Rat varies within injury types by severity for three classes of injuries: neck sprains, back sprains, and knee and shoulder injuries. Here, as in Table 5, we see that GS_Rat falls within injury type. We also see that while more severe injuries tend to entail higher special damages, the ratio of general to special damages varies comparatively little across severity, within injury type. Median GS_Rat for less severe back sprains, for example, is 1.33, while median GS_Rat for more severe back sprains is 1.30. Median special damages for more severe back sprain claims, however, are substantially higher than in less severe back sprain claims: \$1,230 v. \$2,392.

Tables 5 and 6 hint that the within-injury special damage quintile may be at least as strong a predictor of GS_Rat as the overall level of special damages. We can test this hypothesis formally with the following regression:

$$GS\_Rat_{ik} = \beta_o + S_i^q \beta_1 + S_{ki}^q \beta_2 + Injury_k \beta_3 + X_{ik} \beta_4 + \epsilon_{ik} \tag{9}$$

where S_i^q is a vector of indicator variables for the ith claim's overall special damages quantile, S_{ki}^q is a vector of indicator variables for the within injury special damages quantile for the ith claim of injury type k, X_{ik} is a vector of claimant and accident characteristics like gender, marital status, and accident location (see Table 7 for variable definitions and means), and $\epsilon_i k$ is a $N(0,\sigma)$ random disturbance. Omitting the highest quantile, the model implies the q elements of $\hat{\beta}_2$ will decline absolutely across the q quantiles. That is, holding the overall special damages quantile constant, GS_Rat should decline across within-injury type special damage quantiles.[24] I report the results of estimating Equation 9 in Table 8.

The first column of Table 8 is consistent with Figure 1 and Table 2; holding claim characteristics constant, general damages decline as a fraction of special damages as special damages increase. The coefficient on overall special damages quintile falls monotonically from 2.18 for the lowest quintile to

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[24]One concern in estimating Equation 9 is that S_i^q and S_{ki}^q may be highly colinear making it difficult to separately identify $\hat{\beta}_1$ and $\hat{\beta}_2$. Cross-tabulation of S_i^q and S_{ki}^q ($q = 5$), however, shows that 46 percent of the observations lie off the diagonal, suggesting there is sufficient variation across overall and within-injury type special damages quintiles.

0.70, 0.50, 0.34 at the second, third, and fourth quintiles. In the second column, we add within injury-severity special damages quintiles, S_{ki}^q. Holding the overall special damages quintiles constant, we observe that the coefficients on S_{ki}^q decline monotonically across quintiles from (1.41, 0.43, 0.29, 0.13). Note that the pattern of coefficients on S_i^q is less clear now. The coefficient on the lowest overall quintile is still larger than the coefficients on the remaining overall quintiles, but the coefficients on the top four quintiles no longer decline monotonically. We can infer from these results that the within-injury special damages quintile is at least, if not more, important for predicting the ratio of general to special damages than the overall level of special damages. Importantly, consistent with the theory of Section 3, claims that fall well below their median expected value receive proportionally higher general damage awards than claims that exceed their expected median value. The sharp decline in GS_Rat between the lowest and second quintiles is also consistent with the model of Section 3 which predicts GS_Rat will decline with special damages at a decreasing rate.

In the third column of Table 8, we drop the overall special damages quintile so that we can say something about the ratio of general to special damages for claims with median special damages given their injury type. The median claim of a given injury type receives general damages totaling about 1.6 times special damages. As we saw in Table 5, certain injury types command proportionally higher general damage awards. Disfigurement claims, for example, receive general damages totaling 3.3 times special damages at the median. Fractures and psychological claims also receive proportionally higher general damages claims. Our measure of severity does not have a statistically significant independent effect on GS_Rat.[25]

A prediction of Crocker and Morgan (1998) and Crocker and Tennyson (2002) is that insurers will offer a flatter indemnification schedule for injuries that are less costly for claimants to falsify ($\partial \beta^*/\partial \xi > 0$ and $\partial \gamma^*/\partial \xi > 0$). If insurers find it more costly to challenge special than general damages, this further implies that insurers should offer proportionally lower general damage awards for claims that are more susceptible to fraud.[26] I follow Crocker and Tennyson (2002) by assuming sprains and strains are more

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[25]The model includes a variety of additional covariates whose coefficients we do not report in Tables 8 and 9. Complete results are available from the author upon request.

[26]This follows from the fact that $\partial \ GS\_Rat^*/\partial \gamma^* < 0$.

easily falsified than burns and fractures, for example, because of the relative difficulty in diagnosing so-called "soft tissue" injuries. Insurers may also be suspicious of claimants who hire attorneys (48 percent of our sample). Claimants who invest in an attorney may make it more difficult for insurers to detect fraud thereby creating an incentive to flatten the indemnification schedule for these claims.[27]

I test this hypothesis by interacting indicators for sprain injuries and attorney present, $Sprain$ and $Attorney$, with S_{ki}^q. Table 9 reports results of these regressions. In the first column, k indexes injuries by sprain/non-sprain and severity and, in the second column, k indexes injuries by sprain/non-sprain, severity, and attorney. Figure summarizes the estimated coefficients in Table 9. In Figure , we see that sprain injuries receive proportionally lower general damages at all levels of special damages. This is consistent with the findings of Crocker and Tennyson (2002) who report that total damages paid decline more rapidly as special damages increase in the case of sprain injuries than in the case of non-sprain injuries.[28] Figure indicates a slight difference in GS_Rat between attorney and non-attorney claims. In the bottom quintile of special damages, attorney claims earn proportionally lower special damages, but over the rest of the distribution, GS_Rat is the same between attorney and non-attorney claims. The final column of Table 9 shows that claims in which the insurer fully paid claimed special damages, GS_Rat declines more steeply in the bottom quintiles and then lies slightly below GS_Rat in the third and fourth quintiles ($Equal = 1$) when special damages paid equal special damages claimed). This is consistent with the notion that insurers are more likely to flatten the indemnification schedule via general damages when they are constrained to pay special damages in full.

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[27]See, for example, Bond and Crocker (1997).

[28]This is also consistent with the possibility that sprain injuries simply entail less pain and suffering than non-sprain injuries and so receive proportionally lower general damage awards. Consistent with the findings here, Crocker and Tennyson (2002) also report that the difference in slope between sprain and non-sprain injuries is more dramatic when looking at the relationship between total damages paid and special damages claimed than between special damages paid and special damages claimed. This suggests that insurers are more likely to flatten indemnification via general damages than via special damages.

5 Conclusions

Third party BI claimants have an incentive to inflate special damage claims in order to leverage higher general damage awards. This paper hypothesizes that insurers respond in this environment by offering proportionally lower general damage payments to special damage claims that exceed their expected value. It is especially costly to challenge special damage awards in a third-party setting; general damages, however, are highly negotiable, and insurers can use these damages to optimally "flatten" the overall indemnification schedule.

Data on the ratio of general to special damages from more than 15,000 closed BI claims is broadly consistent with this hypothesis. It is clear from these data that insurers rarely challenge third-party special damage claims; in more than 80 percent of claims, insurers fully pay special damage claims. In contrast, first-party auto insurers in no-fault states where access to general damages is limited, fully pay special damage claims in only 65 percent of claims. Indeed, many no-fault states require first-party insurers to explicitly schedule special damages or directly contract for less than full compensation of claimed special damages. These statutory provisions presumably exist in order to combat ex-post moral hazard in an environment in which challenging claimed special damages is costly and insurers have no alternative means for flattening the overall indemnification schedule. Interestingly, restrictions on general damage awards in no-fault states may cause insurers to be more zealous in their oversight of special damage claims, which could have the effect of reigning in medical costs in those states. The IRC data provide some evidence that insurers, statutory provisions aside, do in fact successfully challenge special damages claims more frequently in no-fault states than they do in tort states.

This paper shows that general damages decline proportionally with special damages within specific injury types. I interpret this as evidence that insurers effectively overindemnify general damages when special damages are below their expected value and underindemnify general damages when special damages are above their expected value. This pattern is also consistent with an indemnification schedule that simply awards a relatively fixed amount for general damages for injuries of a given type. For example, insurers may pay $2,000 in general damages for back sprains regardless of special damages claimed under

the presumption that all back sprains entail \$2,000 in pain and suffering. I cannot refute that hypothesis with these data. Jurisprudence and economic theory provide little guidance as to how general damages *should*, in a normative sense, vary with special damages. Indeed, as stated in the Introduction, this lack of guidance is thought to be one of the greatest weaknesses in the American tort system today. This paper provides a positive explanation, based in economic theory, for the observed pattern in general damages. Admitedly, though, it does not rule out other possible explanations.[29]

A tighter test of the model presented here would be to measure how GS_Rat varies with the adjuster's level of suspicion; a model of optimal insurance contracting would predict that the more suspicion a claim raises, the more likely it is that its general damage award will be proportionally reduced. I do note, however, that regardless of the insurer's motivation, a declining GS_Rat schedule, within injury types, creates disincentives to engage in claims fraud assuming that most claims fraud is intended to leverage higher general damage awards. Claimants cannot expect to leverage a constant fraction of special damages into general damage awards.[30] One implication of this finding is that the aggregate cost of claim fraud to insurance companies and policy holders may be substantially less than what is commonly estimated.

I conclude with a final observation regarding the recent time trend in general damages awards under BI insurance. IRC has collected closed-claim data in four separate years (1977, 1987, 1992, and 1997) making it possible to examine how the relationship between special and general damages has changed over time. Table 10 shows median GS_Rat by special damages quintile for 1987, 1992, and 1997.[31] Overall, median GS_Rat fell considerably between 1987 and 1992 from 1.54 to 1.16. The drop was sharpest in the upper quintiles. For example, median GS_Rat in the bottom quintile actually increased between 1987 and 1992 from 1.41 to 1.74 and then fell to 1.50. In the top quintile, though, median GS_Rat fell from 1.38 to 0.99. Note that the decline in GS_Rat is not simply due to rising special damages paid. While

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[29]Others have suggested, for example, that insurers choose to settle small claims with disproportionately large general damage awards in order to "clear the books," although it is unclear what economic model of insurer behavior would generate such a prediction. Again, though, these data alone cannot refute that hypothesis.

[30]A declining GS_Rat schedule does not necessarily alter the incentive to fake injuries altogether rather than simply build-up claims conditional on sustaining a particular injury.

[31]The sample here is comparable to that described in Table 1. It was not possible to develop a consistently defined sample using the 1977 data.

special damages paid increased between 1987 and 1992, they actually fell between 1992 and 1997.

These trends in GS_Rat suggest a shift in the overall relationship between general and special damage awards. Alarm over the size of general damage awards led some states in the mid and late 1980s to enact caps on general damage awards and other tort reforms that could influence the size of general damage awards. These caps, however, were typically greater than \$250,000, far higher than the median general damage award in the 1997 closed-claim data of \$1,431. It seems unlikely that caps of that magnitude would constrain general damage awards under auto insurance.[32] The model of settlement behavior presented in this paper offers an alternative explanation for why general damages declined relative to special damages between 1987 and 1997; namely, insurers perceived a secular increase in fraudulent claiming beginning in the mid 1980s, perhaps because the cost of claims falsification fell ($\partial \xi / \partial t < 0$). Insurers responded to an increase in fraud by offering a flatter indemnification schedule, which, given the problems associated with challenging special damage claims, might translate into a lower elasticity of general damages with respect to special damages. Beyond investigating whether these trends have continued in auto insurance settlements, further research might examine whether this pattern is also evident in civil jury verdicts. That is, do juries also seek to flatten the indemnification schedule even though they are not necessarily constrained to minimize costs?

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[32]Browne and Puelz (1996, 1999) report small effects of general damage caps and reforms related to joint and several liability on general damages under auto insurance, although they rely on purely cross-sectional variation in these laws across states which could bias their results.

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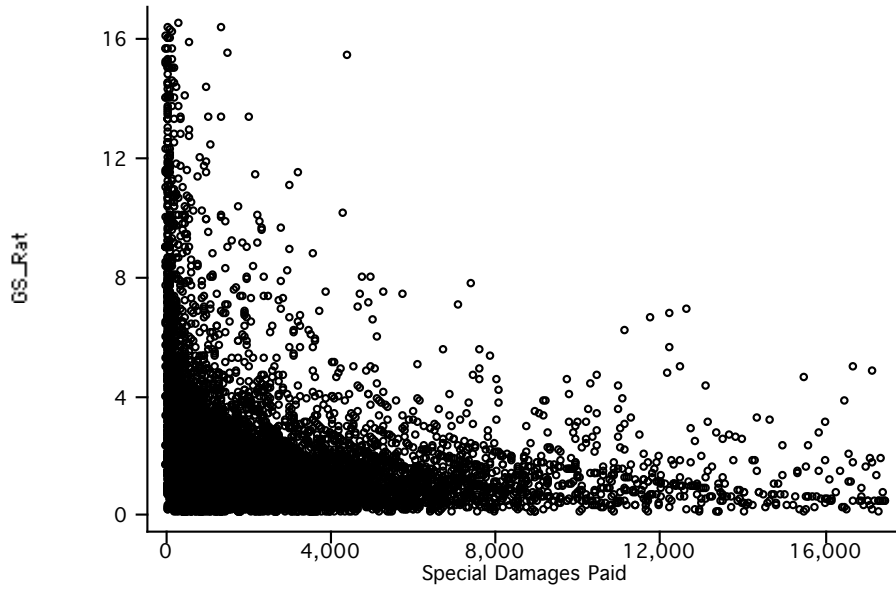
Figure 1: Plot of GS_Rat and special damages paid
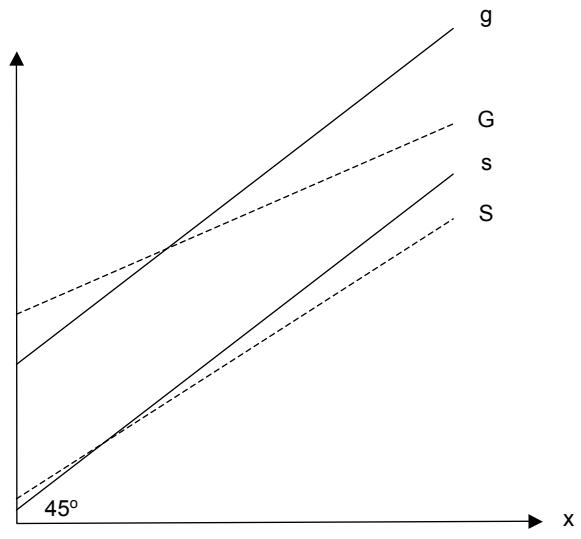
Figure 2: Optimal special and general damage indemnification schedules
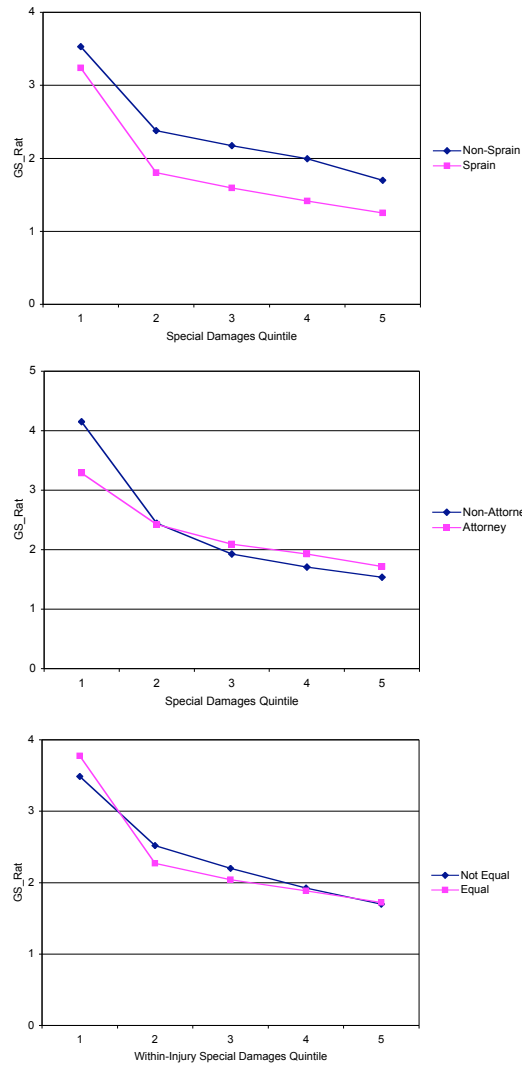
Notes: GS_Rat based on estimated coefficient in Table 9. *Data source*: 1997 IRC Closed-Claim Data.

Figure 3: Effect of sprains and attorney representation on GS_Rat

Table 1: Sample Restrictions

Restriction	Sample Size
All claims	44,276
At least one injury claimed and highest injury known	41,333
Non-fatality, non-permanent disability claim[1]	36,183
Tort claims[2]	30,053
Claimant not at fault[3]	21,987
Claim settled prior to trial	21,803
Positive age	21,696
Positive special and general damages	15,820
Positive special damages claimed	15,685
Trim bottom and top one percent GS_Rat	15,373

Notes: [1]This also excludes rare injuries: permanent brain injury, loss of body part, paralysis, temporomandibular joint dysfunction, and loss of taste, smell, sight, touch, or hearing. [2]We also drop claims in Puerto Rico. [3] This includes 5,381 claims for which degree of fault is missing. *Data source*: 1997 IRC Closed-Claim Data.

Table 2: *GS_Rat* by Special Damages Decile

Special Damages	Mean		Median	
Paid Decile	Specials	*GS_Rat*	Specials	*GS_Rat*
Low	120	4.06	117	3.09
20	320	2.21	315	1.69
30	551	1.75	547	1.29
40	858	1.64	855	1.30
50	1,228	1.60	1,226	1.32
60	1,689	1.46	1,690	1.27
70	2,239	1.47	2,233	1.26
80	2,948	1.30	2,940	1.13
90	4,123	1.26	4,055	1.04
High	10,160	1.23	7,548	1.00

Data source: 1997 IRC Closed-Claim Data.

Table 3: *GS_Rat* by Special Damages Decile: Sample Restrictions

Special Damages Paid Decile	Policy Limits≥ 4×Special Damages	*GS_Rat* = Generals/ Medical Costs	No Attorney
Low	3.09	3.20	4.00
20	1.70	1.89	2.10
30	1.28	1.54	1.66
40	1.28	1.51	1.24
50	1.32	1.52	1.14
60	1.27	1.41	1.09
70	1.25	1.39	1.02
80	1.12	1.24	1.01
90	1.04	1.20	0.90
High	1.00	1.34	0.86
n	14,642	15,065	7,878

Data source: 1997 IRC Closed-Claim Data.

Table 4: Special Damages Paid v. Claimed

Paid v. Claimed Amount	Damages Paid		
	Total Special Damages Paid	Medical Costs Paid	Lost Wages Paid
A. Tort states: BI claims			
Paid < claimed	0.15	0.12	0.08
Paid = claimed	0.84	0.87	0.91
Paid > claimed	0.02	0.01	0.01
n	15,373	15,049	4,607
B. No-fault states: PIP claims			
Paid < claimed	0.63	0.60	0.50
Paid = claimed	0.35	0.39	0.48
Paid > claimed	0.02	0.01	0.02
n	6,188	6,188	1,320

Notes: PIP Sample in Panel B is defined similarly to the BI sample described in Table 1. *Data source*: 1997 IRC Closed-Claim Data.

Table 5: GS_Rat by Special Damages Quintile and Injury Type

	Most Serious Reported Injury					
	Burns/Minor Lacerations		Disfigurement		Neck Sprain	
Specials Paid	Specials	GS_Rat	Specials	GS_Rat	Specials	GS_Rat
20	100	3.18	570	3.40	205	2.16
40	308	1.50	1,621	2.67	658	1.27
60	567	1.14	2,895	2.55	1,360	1.27
80	1,010	1.25	5,084	1.91	2,367	1.19
100	2,525	1.17	10,686	1.52	4,386	1.00
n	833		190		7,734	

Specials Paid	Back Sprain		Other Sprain		Knee/Shoulder	
	Specials	GS_Rat	Specials	GS_Rat	Specials	GS_Rat
20	271	2.11	200	2.60	227	2.67
40	881	1.34	547	1.31	669	1.20
60	1,730	1.31	1,165	1.30	1,447	1.37
80	2,716	1.16	2,212	1.15	3,107	1.38
100	4,880	0.92	4,196	1.04	9,420	1.05
n	3,879		1,202		734	

Specials Paid	Disc		Fracture		Internal Organ	
	Specials	GS_Rat	Specials	GS_Rat	Specials	GS_Rat
20	2,060	2.78	810	2.80	1,174	0.97
40	4,440	1.85	2,128	2.13	3,984	1.05
60	7,096	1.56	4,586	1.61	7,500	1.25
80	11,140	1.27	8,777	1.52	12,118	1.60
100	23,623	0.86	17,450	1.00	31,340	0.89
n	139		404		54	

Specials Paid	Concussion		Psychological	
	Specials	GS_Rat	Specials	GS_Rat
20	288	2.19	65	4.18
40	1,334	0.80	222	3.29
60	2,378	1.22	520	1.72
80	4,140	1.06	1,400	2.47
100	8,128	0.90	4,754	1.70
n	148		56	

Data source: 1997 IRC Closed-Claim Data.

Table 6: *GS_Rat* by Special Damages Quintile and Injury Severity

| Specials | Injury Severity | | | |
| | Less Severe | | More Severe | |
Paid	Specials	*GS_Rat*	Specials	*GS_Rat*
	A. Neck Sprains			
20	157	2.33	448	1.95
40	488	1.33	1,226	1.34
60	994	1.22	2,112	1.27
80	1,760	1.22	3,356	1.08
100	3,250	1.01	5,936	0.95
	B. Back Sprains			
20	184	2.5	540	1.77
40	578	1.33	1,415	1.34
60	1,230	1.33	2,392	1.30
80	2,130	1.16	3,565	1.06
100	3,626	0.96	6,704	0.88
	B. Knee and Shoulder			
20	113	3.20	401	1.76
40	353	1.50	1,235	1.17
60	674	1.25	2,436	1.37
80	1,331	1.58	5,026	1.41
100	3,772	1.19	13,982	0.92

Notes: See text for definition of severity. *Data source*: 1997 IRC Closed-Claim Data.

Table 7: Variable Names and Summary Statistics

Variable	Definition	Mean	Std. Dev.
S_q	Overall special damages quintile		
S_q^k	Within injury special damages quintile		
$Burns$	Burn or minor laceration	0.05	0.23
$Disfigurement$	Disfigurement or serious laceration	0.01	0.11
$Neck$	Neck sprain	0.50	0.50
$Back$	Back sprain	0.25	0.43
$Other$	Other sprain	0.08	0.27
$Knee$	Knee or shoulder injury	0.05	0.21
$Disc$	Disc injury	0.01	0.09
$Fracture$	Fracture	0.03	0.16
$Internal$	Internal organ injury	0.00	0.06
$Concussion$	Concussion	0.01	0.10
$Psychological$	Psychological injury	0.00	0.06
$Severe$	Severe injury	0.45	0.50
$Sprain$	Sustained a sprain or strain	0.83	0.37
$Attorney$	Hired an attorney	0.48	0.50
$Equal$	Special damages paid=claimed	0.85	0.36
$Male$	Male	0.44	0.49
$Male\_m$	Gender missing	0.01	0.11
$Married$	Married	0.31	0.46
$Single$	Single	0.42	0.49
$Divorced$	Divorced	0.01	0.11
$Widowed$	Widowed	0.02	0.15
$Marital\_m$	Marital status missing	0.23	0.42
$Limit$ ($100k)	Policy limit	0.80	1.66
$Limit\_m$	Policy limit missing	0.05	0.21
$Location\_1$	Accident occurred in central city	0.33	0.47
$Location\_2$	Accident occurred in suburb	0.22	0.42
$Location\_3$	Accident occurred in medium-size city	0.31	0.46
$Location\_4$	Accident occurred in small town	0.08	0.28
$Location\_5$	Accident occurred in rural setting	0.04	0.20
$Location\_m$	Accident location missing	0.00	0.07
$State$	Accident state		

Data source: 1997 IRC Closed-Claim Data.

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Table 8: The Effect of Special Damges on GS_Rat

	(1)	(2)	(3)
S_1	2.181	.835	
	(.046)	(.111)	
S_2	.703	.005	
	(.045)	(.087)	
S_3	.501	.132	
	(.044)	(.069)	
S_4	.34	.151	
	(.043)	(.051)	
S_1^k		1.409	2.007
		(.101)	(.042)
S_2^k		.432	.609
		(.08)	(.042)
S_3^k		.288	.352
		(.064)	(.042)
S_4^k		.125	.184
		(.05)	(.042)
$Burns$	-.075	.227	.375
	(.061)	(.064)	(.06)
$Disfigurement$	1.916	1.771	1.706
	(.121)	(.121)	(.121)
$BackSprain$	.09	.034	.013
	(.032)	(.032)	(.032)
$OtherSprain$	.034	.096	.123
	(.051)	(.051)	(.051)
$Knee/Shoulder$	.286	.31	.322
	(.064)	(.063)	(.063)
$DiscInjury$	.88	.497	.343
	(.142)	(.145)	(.14)
$Fracture$	1.03	.823	.732
	(.086)	(.087)	(.085)
$InternalOrgan$	.208	-.101	-.209
	(.225)	(.224)	(.223)
$Concussion$	.262	.186	.18
	(.136)	(.135)	(.136)
$Psychological$	.945	1.233	1.408
	(.22)	(.218)	(.219)
$Severe$	.234	-.048	-.188
	(.029)	(.036)	(.027)
$Const.$	.902	1.107	1.224
	(.058)	(.06)	(.055)
Obs.	15373	15373	15373
R^2	.206	.224	.212

Notes: Omitted variables include S_5, S_5^k, and $NeckSprain$. Regression includes all variables in Table 7. Standard errors are in parentheses. *Data source*: 1997 IRC Closed-Claim Data.

Table 9: The Effect of Special Damges on GS_Rat: Interactions

	(1)	(2)	(3)
S_1^k	1.83	2.613	1.791
	(.103)	(.057)	(.111)
S_2^k	.681	.907	.823
	(.103)	(.058)	(.11)
S_3^k	.476	.39	.502
	(.103)	(.057)	(.11)
S_4^k	.297	.17	.227
	(.103)	(.057)	(.11)
$S_1^k * Sprain$	.157		
	(.113)		
$S_2^k * Sprain$	-.128		
	(.113)		
$S_3^k * Sprain$	-.134		
	(.113)		
$S_4^k * Sprain$	-.131		
	(.113)		
$S_1^k * Attorney$		-1.041	
		(.082)	
$S_2^k * Attorney$		-.201	
		(.083)	
$S_3^k * Attorney$		-.015	
		(.082)	
$S_4^k * Attorney$		.038	
		(.082)	
$S_1^k * Equal$			.259
			(.119)
$S_2^k * Equal$			-.274
			(.119)
$S_3^k * Equal$			-.184
			(.119)
$S_4^k * Equal$			-.065
			(.119)
$Sprain$	-.446	-.485	-.495
	(.08)	(.036)	(.037)
$Severe$	-.173	-.157	-.179
	(.027)	(.027)	(.028)
$Attorney$		.181	
		(.059)	
$Equal$			.026
			(.085)
$Const.$	1.698	1.536	1.697
	(.088)	(.069)	(.098)
Obs.	15373	15288	15080
R^2	.194	.234	.204

Omitted variables include S_5 and S_5^k. Regression includes all variables in Table 7 other than specific injuries. In column (1), S_i^k is calculated within sprain and severity cells. In column (2), S_i^k is calculated within sprain, severity, and attorney cells. In column (3), S_i^k is calculated within sprain, severity, and equal cells. Standard errors are in parentheses.
Data source: 1997 IRC Closed-Claim Data.

Table 10: *GS_Rat* by Special Damages Quintile and Year

	Special Damages Quintile				
Year	Low	2	3	4	High
	A. Special Damage Paid ($1982)				
1987	124	327	714	1,503	3,479
1992	201	543	1,142	2,040	3,977
1997	191	488	957	1,655	3,301
	B. *GS_Rat*				
1987	1.41	1.37	1.79	1.65	1.38
1992	1.74	1.50	1.59	1.33	1.12
1997	1.50	1.18	1.21	1.13	0.99

Notes: PIP Sample in Panel B is defined similarly to BI sample. See text. *Data source*: 1997 IRC
Closed-Claim Data.