

Statutory Rules, Attorney Involvement, and Automobile Liability Claims

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ABSTRACT

The cost associated with an automobile liability incident in the United States has been hypothesized to be related to different tort reform statutes, the presence of no-fault rules, and the impact of a plaintiff's attorney. This article tests these relationships and reports the marginal impact of variables related to liability claims with individual loss data from a representative insurer. Among major tort reforms, our analysis reveals that punitive damage limits, caps on noneconomic damages, and minor reforms (sanctions on frivolous suits or defenses, prejudgment interest, and provisions for structured settlements) are associated with a reduced individual claim severity. Reform of the joint and several liability rule is associated with an increased individual claim severity in this insurance market. Low dollar thresholds and add-on no-fault rules increase liability claim severity, while no statistically significant difference in claim severity is found when the claim is subject to verbal threshold rules relative to tort law. Finally, attorney involvement is associated with a 64 percent increase in the average claim size.

INTRODUCTION

Several researchers cite the expansion of tort law as an important determinant of liability insurance costs. Abraham (1987), Priest (1987), Trebilcock (1987), and Willard (1986) attribute this expansion to the increasing perception of the tort system as a form of "compensation insurance" for unpreventable injuries and to the recognition that internalizing injury costs to the party generating them enhances efficiency. This notion has led to the restriction of defenses manufacturers may use in court and an increasingly liberal interpretation of insurance contracts. The

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The authors gratefully acknowledge helpful comments received on previous versions of this article from Patricia Born, Joan Schmit, seminar participants at the University of Minnesota, and two anonymous referees.

tort reform movement of the 1980s can be viewed as a reaction to the expansion of tort law up to that time.¹

In the mid-1980s, liability insurance markets began to show significant stress with increasing awards associated with tort litigation and substantial insurer losses within liability lines. Subsequently, various states passed tort reform legislation. These reforms were, in part, a response to a sharp increase in the price of liability insurance and a sharp decrease in its supply during those years. Viscusi et al. (1993) assert that the mid-1980s' tort reforms were intended to address the problems in liability insurance markets during this time period. The underlying causes of the price-quantity reactions have been subject to debate, however.

The arguments put forth focus upon disparate phenomena. Clarke et al. (1988) and Danzon (1984a) argue that increased uncertainty about future claim costs led to rapid premium growth and subsequent contraction in the supply of liability insurance. Harrington (1988) finds that the growth in the discounted value of insurer reserves in the early 1980s outpaced substantially the growth in premium flows and that significant premium increases were needed in 1985–1986 to lessen this gap. Priest (1987), and to a limited extent Abraham (1991), suggest that an increase in adverse selection and an increase in the correlation among risks at that time led to the liability insurance crisis. Angoff (1988) interprets the crisis as evidence of collusion among insurers. Goldberg (1986) contends that the crisis was brought about by a shift in the insurance underwriting cycle. Whatever the causes, state tort reform initiatives were enacted, in part, to reduce the loss costs borne by liability insurers and thereby temper the crisis in price, supply, and transaction costs.²

The results of empirical research on the degree of success the state tort reforms of the 1980s achieved in reducing insurer liability costs thus far have not been conclusive. Viscusi et al. (1993) find mixed evidence that the tort reform initiatives reduced insurers' general liability and medical malpractice claims costs, although their data was limited to statewide information on premiums and losses. Utilizing insurance firm-level data, Born and Viscusi (1994) find statistically significant evidence that, following the adoption of the reforms, insurer general liability loss ratios declined 11 to 25 percent. Lee, Browne, and Schmit (1994), testing whether joint and several tort reform measures reduced the rate of litigation frequency, find weak evidence that the measures reduced the rate of litigation but only after they were in place for several years. In addition, they also find weak evidence that other tort reforms—amendments to the collateral source rule, caps on noneconomic damages, caps on punitive damages, and penalties on those bringing frivolous lawsuits—have resulted in reduced litigation as well.

However, none of these studies disaggregate the tort reform measures, since doing so could produce unreliable estimates; for example, with statewide or firm-level data, at a given moment, potential collinearity problems exist since reform

¹ For a succinct summary of the development of modern tort law during the twentieth century, see Priest (1991).

² The cost of bringing a lawsuit and the time it takes to resolve it have also given rise to alternative dispute resolution programs, such as arbitration and mediation.

statutes often comprise mixed packages of measures.³ Thus, there is a need for research that examines individual liability claims across time from states which have enacted differing tort reform statutes (with different package mixes) to see if particular tort reform measures have had their predicted effect of lowering the average size of a liability claim. In this empirical environment, it is less likely that collinearity problems will give rise to unreliable estimates, and useful information about marginal impacts of reforms on insurance costs can be ascertained.

This article examines a set of characteristics linked to liability insurance costs. We are able to provide initial evidence from the automobile liability insurance market on the impact of specific tort reform measures on the severity of individual insurance claims by considering a time horizon during which many tort reform statutes were implemented. Even though a typical automobile liability claim can be characterized as a routine, low-severity claim (Hensler et al., 1987) compared to a products or malpractice claim, we expect changes in statutes to nonetheless alter behavior in this market as well. There do exist catastrophic automobile liability claims whose value can be significantly altered by a change in tort law. In addition, the impact of statutory changes to tort on insured automobile liability claims must consider the no-fault environment, since these latter rules trigger different provisions of insurance coverage and modify the ability of an injured plaintiff to sue under tort.

We focus on seven reforms passed during the mid-1980s: modification of joint and several liability, modification of the collateral source rule, limits on noneconomic damages, limits on punitive damages, sanctions on frivolous suits or defenses, prejudgment interest, and provisions for structured settlements. Individual data permit us to address empirically a number of interesting relationships between these reforms and other recognized cost drivers and actual claim severities in the liability market while controlling for injury-specific and state-specific components that are related to the size of a liability insurance claim. For example, we are able to assess the differential valuation of a commercial automobile liability claim compared to a personal automobile liability claim, and examine the claims cost implications of no-fault statutes, while controlling for adjustment expenses, the type of injury, and attorney involvement. Thus, we are able to move beyond examining differences in aggregate insurance premiums, instead focusing on their primary component, actual individual claim costs.

While controlling for a set of environmental, economic, and injury type variables, our empirical results reveal that attorney involvement is associated with an increase in the average individual claim size amount of 64 percent. Among the major tort reforms, caps on noneconomic damages correspond to a decrease in average claim size by the largest percentage (62 percent), and limits on punitive

³ Empirical analysis of individual reforms has been undertaken in studies that examine the impact of 1970s tort reform on medical malpractice claims. Danzon (1984b) develops a model characterized by a system of equations that captures claim frequency, severity, total loss cost, and the likelihood to enact tort reforms. Sloan, Mergenhausen, and Bovbjerg (1989) analyze the impact of tort reform on individual insured malpractice claims by testing a variety of empirical specifications that capture claim severity and the speed with which a claim is resolved.

damages decrease average claim size by 40 percent. The removal of joint and several liability had the opposite effect, associated with an increase in average claim size. We found no statistically significant association between reform of the collateral source rule and average claim size. Among the package of minor tort reforms—such as structured settlements, prejudgment interest, and sanctions against frivolous claims—the average claim size is associated with a decrease of 10 percent with the addition of each minor reform. Finally, the presence of relatively low dollar thresholds and add-on statutes were associated with 27 percent and 115 percent increases in average bodily injury claim sizes, respectively, relative to tort law states.

The next section of this article discusses briefly the legal background of an automobile liability incident and the role of no-fault insurance in settling a liability claim. Then, we introduce the data, discuss characteristics of the sample, and present the econometric model. Finally, we report estimation results and contrast the magnitude of the marginal impact of factors found to be significantly related to the size of a liability claim.

BACKGROUND: SETTLING AN AUTOMOBILE LIABILITY CLAIM

A party who is involved in an automobile incident may suffer property damage losses and/or a personal injury that requires medical attention and time away from work. To cover these economic losses, an individual may have personal, first-party insurance, or the victim may have redress through the tort system, which is the conventional mechanism for providing and determining compensable damages. Under tort law, injured parties must prove negligence to collect for special damages (medical bills and lost wages) and general damages (pain and suffering). Changes in the rules of civil law can affect the likelihood that a plaintiff will achieve a successful outcome at trial and the size of the award. Economic models of claim behavior treat the decision to bring a claim as a function of the expected costs and benefits to the potential plaintiff (see, e.g., Cooter and Rubinfeld, 1989; Bebchuk, 1988; Viscusi, 1986). Because changes in the rules alter probabilities of success and the magnitude of payoffs, they are expected to influence the decision to bring a lawsuit.

Because a defendant may be required to pay substantial damages, individuals and commercial firms purchase bodily injury/property damage insurance to protect themselves from this risk. Indeed, financial responsibility laws in most states dictate that individuals purchase a minimum amount of liability insurance in order to drive an automobile. Liability insurance protects the insured by providing for payment to a third party for bodily injury and property damages resulting from an automobile accident for which the insured is deemed legally liable.

Owners and drivers of automobiles may also be protected by no-fault statutes that, in theory, were developed to reduce administrative costs by replacing a third-party liability system with first-party coverage and to provide full compensation

for economic damages.⁴ Under a no-fault system, accident victims collect from their own insurer, regardless of fault. However, most no-fault statutes also permit the victim to sue for general damages and uncovered first-party economic damages if the special damages exceed a verbal or defined monetary threshold, depending on the type of statute. Harrington (1994) finds that the probability of adopting no-fault statutes is higher in states that exhibit higher premium growth in their automobile liability insurance costs. Cummins and Weiss (1991) find that no-fault states with verbal thresholds have lower pure premiums, or expected loss values, than tort states or no-fault states with monetary thresholds. Moreover, they find that monetary threshold no-fault states had higher pure premiums than tort states. Therefore, particular types of no-fault statutes affect the distribution of loss costs, and the joint impact of no-fault statutes and tort reforms is of interest to us here.

THE DATA AND THE EMPIRICAL MODEL

This section introduces the empirical model and the data used to test and evaluate the relationships between various tort reform measures and other cost drivers and the value of a liability insurance claim.

The Data and Equation Specification

Our data come from two sources. First, we have 3,753 individual automobile bodily injury liability paid and closed claims from 1989 from a major U.S. property-liability insurer that had approximately \$14 billion in assets and \$550 million in net written automobile liability premiums during the 1989 fiscal year. The data include information on the type and cause of loss, location and date of occurrence, and the nature of attorney involvement—for example, whether the insurer litigated a claim. Second, we have state-specific tort reform information provided by the American Tort Reform Association that encompasses a number of reform laws enacted from 1980 to 1990 as well as subsequent court interpretations of the statutes.

Since the loss data for our study come from an insurer, the scope of the analysis and the hypothesized relationships must be put in context. Theoretically, one could analyze the effect of tort reforms and demographic and environmental factors on the average severity of third-party claims, whether the claims are insured or not. In a sense, the severity variable would capture reported “true” values uncontaminated by insurance policy limits and exclusions. Because we are limited to insured claims, the extent of the inferences made about tort reforms are valid as they apply to the average severity value of an insured claim. There is some chance that the actual claim amount is greater than the amount of insurance, thereby triggering an upper limit. However, the data give us no indication when this might happen, so the inferences from our analysis are with respect to insured loss amounts.

⁴ In one of the first empirical studies testing the efficiency of the no-fault system, Witt and Urrutia (1983) find weak evidence that loss payments were delivered more efficiently in no-fault states than in tort states.

Tort reforms also affect the bargaining positions of the parties while negotiating an out-of-court settlement, impacting on the sample of insured claims. Each party to an incident uses its own perceptions about the potential outcome of a suit in the court system to assist in determining its acceptable settlement amount. Because many claims are settled out of court, the study examines how tort reforms have altered the insurer's and plaintiff's perceived bargaining positions.

The variable we strive to explain is the severity of an individual insured claim. Our primary interest is the role of tort reform statutes and the estimated impact each statute has on the average size of a claim. We isolate these effects while controlling for other factors such as the presence of an attorney, the type of no-fault statute present in the state where the loss occurred, and the type of injury. In our data, for a given state, some losses occur before passage of a tort reform, and some losses occur after the passage of tort reforms. Therefore, the impact of a tort reform on the severity of an insured claim is captured both cross-sectionally—that is, relative to states where the statute is not in existence—but also across time within a given state.

Each claim was paid and closed in 1989, although many were opened in years prior to the passage of tort reforms. The frequency distribution in Figure 1 illustrates the distribution of the number of claims by occurrence date. The majority of claims occur after the passage of most tort reform legislation, in the 1986–1987 period. Approximately 10 percent of the claims occurred prior to this period. Since the statute that applies is the one in existence at the time a claim enters the legal system, some claims in tort reform states, because of timing, are not subject to the latest tort reforms. For a given state, we are able to distinguish between these claim types because we know the date a suit was filed by the claimant and the American Tort Reform Association provided us with tort reform enactment dates on a state-by-state basis. For insurance claims not accompanied by a subsequent filing of a suit, we let the occurrence date of the claim dictate whether it was subject to tort reform or not.

Our empirical model is a log-linear regression, where the dependent variable is the natural logarithm of the net individual loss scaled by the average cost of a semi-private hospital room in the state where the loss was incurred, and the independent variables consist of tort reform dummy variables and a set of economic and environmental control variables.⁵ The net individual loss is the total claim cost less administrative and investigation expenses. Since our data represent bodily injury claims, we standardized the dependent variable by the average cost of a semi-private hospital room to benchmark claim severity that would otherwise vary across states and over time. We undertake a logarithmic transformation of the dependent variable under the assumption that changes in tort reforms and other

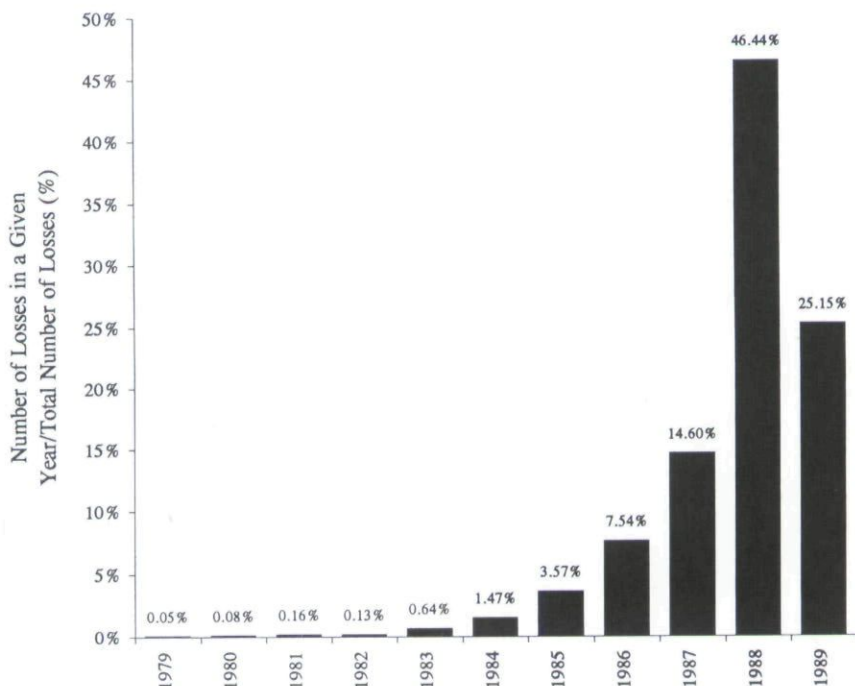
⁵ In certain empirical environments (e.g., Danzon, 1984b), the average claim size will be a determinant of the probability to enact tort reform, raising the econometric problem of simultaneity. Because our data comprise individual automobile liability claims that are minor relative to medical malpractice and general liability claims, and statewide tort reforms generally are applicable to many insurance lines, we treat the tort reforms as exogenous in our empirical model.

exogenous factors will have a proportional effect on normalized claim severity. Nonqualitative independent variables also are logged.

The information in our data concerning legal representation is limited to the defense, although we have no *a priori* reason for an insurer to allocate its litigation resources to a liability claim unless the plaintiff has legal representation as well.⁶ The attorney variable is a binary variable that takes the value of one when an attorney is involved and zero otherwise. We expect the coefficient on the attorney variable to be positive, indicating that higher liability claims are associated with counsel involvement. Support for this hypothesis would be consistent with the empirical finding by the All Industry Research Advisory Council (1989) that attorney involvement results in higher average automobile claim settlements, and by Fields and Venezian (1991), who find that the addition of legal representation increases the medical cost component of a workers' compensation claim.

Our empirical analysis focuses on the change in the severity of a liability claim associated with tort reform measures. The marginal impact of the presence of a particular tort reform is measured both cross-sectionally and within a given

Figure 1
Distribution of Claims Occurring 1979 Through 1989



⁶ Our data do not indicate whether the claim is a controverted claim, that is, one where the insurer originally denied liability but later liability is found to exist.

state depending on when a legal claim was filed. The empirical specifications of the five reforms considered—joint and several liability, collateral source rule, limits on noneconomic damages, limits on punitive damages, and minor reforms—are summarized in Table 1.

Table 1
Empirical Treatment of Five Tort Reforms

Reform	Empirical Treatment
Joint and Several Liability	Equals one if at the time of loss the state where the loss occurred has modified the statute that allows an injured plaintiff to collect an entire award from any one defendant and zero otherwise.
Collateral Source Rule	Equals one if at the time of loss the state where the loss occurred has permitted insurance recovery from a victim's first-party insurer to offset the damage judgment and zero otherwise.
Noneconomic Damages	Equals one if at the time of loss the state where the loss occurred has set a maximum on the recovery of noneconomic damages and zero otherwise.
Punitive Damages	Equals one if at the time of loss the state where the loss occurred has set a maximum on the recovery of punitive damages and zero otherwise.
Minor Reforms	A count variable taking the value of zero, one, two, or three, depending on the number of reforms in place at the time of loss. Candidate reforms include prejudgment interest, provisions for periodic payments, and sanctions on frivolous suits or defenses.

The Tort Reforms

Under the doctrine of joint and several liability, which most states have traditionally maintained, if two or more defendants have a role in the cause of the plaintiff's injuries, then they are held to be joint malefactors individually responsible for the entire amount of the loss regardless of proportionate fault. Our analysis considers a state as having enacted a reform if it does not allow the rule of joint and several liability.⁷ The rule can result in parties bearing a large share of the loss costs even though they may have contributed to the loss in a minor way. Schmit, Anderson, and Oleszczuk (1991) discuss the arguments for and against joint and several liability. In general, proponents feel that it encourages safety and increases the likelihood that injured parties will be compensated for their losses. Advocates of reform note that joint and several liability can lead to an inequitable distribution of loss costs.

⁷ For example, although Kansas did not pass a reform during the time period we examine, it never allowed joint and several liability. In this event, we consider it as having passed the reform.

Joint and several liability reform is expected to result in lower claim size for two reasons. First, reform will result in smaller claims if aggrieved parties are unable to link "deep pockets" defendants who are only slightly responsible for a loss in order to maximize the amount of the award. Second, to receive full compensation for a loss, injured parties may need to bring several legal actions for moderate amounts against different parties rather than one action for a substantial amount against a single party.

The collateral source rule is a rule of evidence that forbids the introduction of information about a plaintiff's compensation from sources other than the defendant. Modifications to this rule include permitting the introduction of the information when considering the liability amount for the defendant and requiring any awards to be automatically offset by the collateral source amount. Advocates of abolishing the collateral source rule feel that it results in over-indemnifying injured parties, while proponents of the rule contend that it strengthens the deterrence motive of the tort system (Lorentzen and Rankin, 1984; Murrey, Tosh, and Hollman, 1987). We expect a modifying statute to reduce the size of an individual claim, because it is more likely that the injured party is precluded from receiving multiple indemnifications on a single loss. This expectation has support from Viscusi (1990), who finds products liability premiums to be lower in states that had collateral source rule provisions for the period before 1984.

Noneconomic damages are awarded for losses that do not have an exact cash value, such as bereavement, loss of consortium, and pain and suffering. Juries typically have little guidance in determining these amounts as the losses are subjective. The American Tort Reform Association alleges that jury awards for noneconomic damages show considerable variation in amount. Cummins and Tennyson (1995) assert that these awards introduce a "lottery element" into the tort system. They argue that limits on noneconomic damages will reduce the costs of the legal system, expedite settlements, and make for a more reasonable system.

In a few states, there exist laws that limit the liability of defendants for noneconomic damages or the total amount of damages recoverable. However, the laws often apply only to certain types of claims, for example, medical malpractice. States that have passed reforms limiting noneconomic damages that apply to automobile liability claims are listed in Table 2. Because we are concerned only with the severity of an automobile liability claim, we let noneconomic damages equal zero for those states that have either a liability limit for medical malpractice claims only or no limit at all. Where comprehensive liability limits exist, we expect the effect on the average severity of an insured automobile liability claim to be negative, since the impact of removing supra-catastrophic awards would be to reduce the average size of the claim pool. In addition, by capping the potential award while not reducing the costs of bringing a claim, limits are expected to reduce the incentive to bring a legal action.

Punitive damages are intended to punish the tortfeasor and to discourage future wrongdoing (Owen, 1982). In many cases in which compensatory damages are awarded, punitive damages are not. As with noneconomic damages, punitive damages are in large part subjectively determined and often appear to be arbitrary.

However, Long (1977, 1981) and Schmit, Pritchett, and Fields (1988) indicate that punitive damages can promote justice, allow for retribution through the legal system when monetary damages are low but intangible losses are high, provide a means of deterrence, and provide for compensation when noneconomic damages are difficult to receive.

Table 2
Limitations on Awards for Noneconomic
Damages on Automobile Liability Claims

<i>1986</i>	
Alaska	\$500,000 cap (except for physical impairment or disfigurement)
Colorado	\$250,000 cap (unless court finds justification by "clear and convincing evidence" for a larger award which cannot exceed \$500,000)
Hawaii	\$375,000 cap but cap applies only to actual physical pain and suffering; other noneconomic damages have no limit
Maryland	\$350,000 cap
Minnesota	\$400,000 cap on all awards based on loss of consortium, emotional distress, or embarrassment
<i>1987</i>	
Idaho	\$400,000 cap, adjusted for annual wage increase
Kansas	\$250,000 cap on pain and suffering (not other noneconomic losses)
Oregon	\$500,000 cap on noneconomic damages

Source: American Tort Reform Association.

Punitive damage reform measures vary and include setting limits on the amount that may be awarded in total or relative to compensatory damages, limiting the type of case in which punitive damages may be awarded, dictating that damage awards be paid to the state, or requiring hearings to establish a case for punitive damages before they may be sought in court. If any of these reforms exist, we let punitive damages equal one and zero otherwise. If there is any significant variation between changes in punitive damages law and claim severity, we expect the relationship to be negative, since some catastrophic claims would be reduced or eliminated, affecting the overall mix of claims.

For insured automobile liability claims, the impact of punitive damage reform depends on punitive damages being insurable under the automobile insurance contract. To indicate claims that were filed in states where punitive damages are insurable and those that are not, we specify a variable for insurable punitive damages, which equals one when damages are insurable and zero when they are uninsurable. Information on the legal status of punitive damages insurability was obtained from the Fire, Casualty & Surety Bulletins (1990). We expect the relationship between insurability and claim size to be positive, reflecting higher

average*insured claims when the punitive damage claim amount can be included in the overall claim settlement.

Finally, we include the term, Puni•Puniins, which allows the overall effect of punitive damage tort reform on individual loss to depend on the insurability of punitive damage claims.

The minor reforms variable is a count of the number of minor reforms in place at the time a claim is filed from among the set of minor reforms: limitations on prejudgment interest, provision for structured settlements, and sanctions on frivolous claims. Reforms on prejudgment interest typically mandate a prohibition or limit on prejudgment interest. Provisions for structured settlements enable the liable party to spread damages owed over a defined time period. Sanctions on frivolous suits or defenses are financial penalties imposed on parties who bring legal actions without merit or employ groundless defenses. Preliminary testing of these minor reforms indicates severe collinearity problems when these variables are introduced individually. However, we want to at least control for these lesser phenomena and we expect the coefficient on this variable to be negative, reflecting an associated decrease in individual settlements as these minor reforms are introduced.

Control Variables

We include a set of four indicator variables that represent the type of no-fault statute operating in the state where the claim is filed to reflect the impact of these statutes on the liability amount claimed. We expect no-fault statutes to affect the severity of a liability claim since certain types of no-fault statutes put a constraint on the right to sue for damages. We expect a positive effect of different no-fault statutes relative to a tort standard on claim size since, as noted in Rand Corporation (1985), the tendency of the tort system is to overcompensate small claims and undercompensate large claims. Moreover, no-fault statutes reduce the frequency of small bodily injury claims, thus increasing average claim severity.

Four dummy variables reflect different no-fault statutes. The benchmark case is a tort law state. The verbal threshold variable equals one when the state is a verbal threshold state and zero otherwise. A verbal threshold state permits lawsuits only in the most severe cases where damages result from death, dismemberment, disfigurement, or the permanent loss of a body function. The next two indicator variables represent categories that capture dollar thresholds where the right to sue is conditional upon compensatory damages exceeding the dollar threshold. The high dollar threshold variable equals one for each state that has a dollar threshold greater than \$1,000 and zero otherwise. The low dollar threshold variable equals one for each state that has a dollar threshold less than \$1,000 and zero otherwise. The add-on variable equals one for each state that has an add-on no-fault law and zero otherwise. In general, add-on laws require that benefits be paid to an accident victim regardless of fault, but the injured person still maintains the right to sue the driver causing the accident. These four dummy variables are all set equal to zero for the benchmark case of a state that has no no-fault statute (a tort liability state). We expect positive signs on the no-fault dummy coefficients, consistent with the

prediction that no-fault monetary thresholds and an add-on law will alter the mix of bodily injury liability claims, removing relatively small claims from the sample, and increasing the average size of claim severity.

We include two variables—degree of urbanization and unemployment rate—to control for environmental and economic factors expected to affect the size of a liability claim.⁸ The urbanization measure comes from the *Statistical Abstract of the United States* and is defined as the percentage of the state population living in a metropolitan area.⁹ Higher values for the urbanization variable, which proxies the quantity of social interaction and contact, are expected to be associated with higher injury rates, higher litigation rates, and an increase in the severity of a claim. Higher values of the unemployment rate variable are expected to be associated with higher claim amounts, since, as Danzon (1986) has observed and Cummins and Tennyson (1995) have suggested empirically, unemployment is related to the willingness of injured parties and attorneys to seek additional compensation for losses.

We control for the injury type of claim by specifying five categories of injury types, although the precision of the classification system we employ for the model is limited by the data. The cut/laceration variable ($n = 272$) takes the value of one for a laceration or cut and zero otherwise. The bone fracture variable ($n = 70$) takes the value of one for an injury resulting in a bone fracture and zero otherwise. The strain/sprain variable ($n = 1,090$) takes the value of one for an injury resulting in a sprain or strain and zero otherwise. The multiple injuries variable ($n = 290$) takes the value of one for multiple injuries and zero otherwise. Each variable in the set takes the value of zero for the benchmark case of unclassified injuries ($n = 2,031$).

The event year variable is the difference in time between 1989 and the year the claim was commenced to approximate the number of years claims in our data were open prior to their ultimate closing in 1989. We expect a positive coefficient on the event year variable, reflecting an expectation that claims which have been opened for longer periods of time will be larger, *ceteris paribus*. We specified the expenses variable, which is the natural logarithm of settlement expenses, to gauge the extent to which settlement costs are related to claim size. Recall that the dependent variable incorporates the loss net of settlement expenses. A positive coefficient value for the expenses variable suggests that insurers incur higher settlement costs with claims for higher dollar amounts.

Finally, we control for the policy type since claims are filed under both personal and commercial automobile contracts. Policy type equal to one indicates coverage under the personal auto policy, and policy type equal to zero indicates coverage under a commercial automobile policy. We expect the coefficient on the policy type variable to be negative, consistent with a “deep pockets” argument proffered and validated by Chin and Peterson (1985) that jury verdicts and

⁸ Preliminary testing introduced other environmental factors—such as the number of lawyers per capita, vehicle miles per capita, and population density—but they created severe collinearity problems with the urbanization variable.

⁹ “Metropolitan” refers to the 250 standard metropolitan statistical areas and 18 consolidated metropolitan statistical areas as defined by the U.S. Office of Management and Budget, June 30, 1993.

consequently settled claims against corporations and institutions are higher than similar claims against individuals.

EMPIRICAL RESULTS: WHAT AFFECTS CLAIM SEVERITY?

Many states were not represented in the data or had fewer than ten losses and were excluded from the sample. The final sample comprised 21 states.¹⁰ The model, which explains nearly 24 percent of the variation in scaled claim size (in logarithmic form), appears to fit the data well.¹¹ A significant amount of the variation in claim size not captured by the model is likely attributable to the risk traits of the individual insureds/tortfeasors and the particular circumstances surrounding each claim. Information such as the age and wage level of the injured party and the number of days of hospitalization are not in our data set.

The estimated parameter values for the log-linear regression are reported in Table 3. We implemented White's (1980) test for heteroscedasticity and rejected the hypothesis of homoscedasticity at the 0.01 significance level. T-ratios reported in Table 3 have corrected standard errors. In general, the overall empirical model for the severity of automobile liability paid claims is significant at the 0.01 level as reflected in the 57.13 value for the F-statistic. The majority of the estimated coefficients have the hypothesized sign and are statistically significant.

As expected, the coefficient on the attorney involvement variable is positive and highly significant, suggesting that claims in which an attorney is involved result on average in larger loss payments. Indeed, the value of the coefficient tells us that the average rate of increase in a scaled liability claim when an attorney is present is about 64 percent relative to a claim where no attorney is present.¹² This result may indicate that attorneys are able to obtain more equitable settlements from insurers than plaintiffs could on their own. Alternatively, attorneys may instruct clients on how to increase the size of their loss in hopes of achieving a greater settlement.¹³ The positive relationship would also arise if insurers assign attorneys to claims exceeding a monetary threshold.

The impact of the various tort reforms are also quite significant, with only the reform of the joint and several liability rule showing no clear reduction on the severity of the liability claim.¹⁴ The positive coefficient of the joint and several

¹⁰ In alphabetical order, the jurisdictions represented in the final sample are Arizona, Arkansas, California, Georgia, Illinois, Kentucky, Louisiana, Maryland, Massachusetts, Mississippi, New Jersey, New York, North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee, Texas, Vermont, Virginia, and Wisconsin.

¹¹ The mean value of claim size in our data is \$12,791. The standard deviation of claim size is \$66,108.

¹² Note that, since the dependent variable is in logarithmic form, its percentage change is measured by the exponentiation of the estimated coefficient; for example, for attorney involvement, the change in average claim severity is $(e^{0.49194} - 1) = 0.6354$.

¹³ Brickman, Horowitz, and O'Connell (1994) make this argument to support their proposal for contingency fee reform. For a discussion of empirical research supporting their position, see pages 31-34 of their study.

¹⁴ In preliminary testing, we interacted the variables for the collateral source rule and policy type, since we might expect that commercial automobile claim plaintiffs would be more likely to have

Table 3
Estimates of the Empirical Model

Variable	Coefficient	t-ratio
Intercept	-1.0383	-1.375
Attorney	0.49194	5.685
<i>Tort Reforms</i>		
Joint and Several	0.28874	3.244
Collateral Source Rule	-0.04823	-0.382
Noneconomic Damages	-0.95873	-2.749
Punitive Damages	0.16561	0.949
Insurable Punitive Damages	0.81355	5.513
Puni•Puniins	-0.50349	-2.531
Minor Reforms	-0.1073	-2.097
<i>No-Fault</i>		
Verbal Threshold	0.45826	1.147
High Dollar Threshold	0.52251	0.965
Low Dollar Threshold	0.24005	1.602
Add-On	0.76549	2.741
Urbanization	0.62089	3.855
Unemployment Rate	-0.14688	-0.853
<i>Injury Type</i>		
Cut/Laceration	-0.62395	-6.504
Bone Fracture	0.90871	4.806
Sprain/Strain	-0.12837	-2.365
Multiple Injuries	-0.01554	-0.146
Event Year	0.35334	12.248
Expenses	0.15490	11.15
Policy Type	-0.10122	-1.892
R ² = 0.2433	Adjusted R ² = 0.239	

Note: The dependent variable for the log-linear regression is the natural logarithm of the net individual loss. Attorney is a binary variable equal to one if an attorney is involved in the claim and zero otherwise. For definitions of joint and several, collateral source rule, noneconomic damages, punitive damages, and minor reforms, see Table 1. Insurable punitive damages equals one when punitive damages are insurable and zero when they are uninsurable. Puni•Puniins is the interaction of punitive damages and insurable punitive damages. Verbal threshold equals one when the state is a verbal threshold state and zero otherwise. High dollar threshold equals one for each state that has a dollar threshold greater than \$1,000 and zero otherwise. Low dollar threshold equals one for each state that has a dollar threshold less than \$1,000 and zero otherwise. Add-on equals one for each state that has an add-on no-fault law and zero otherwise. Urbanization equals the natural logarithm of the percentage of the state population living in a metropolitan area. Unemployment rate equals the natural logarithm of the state's unemployment rate. Cut/laceration equals one if the injury is a laceration or cut and zero otherwise. Bone fracture equals one if the injury is a bone fracture and zero otherwise. Sprain/strain equals one if the injury is a sprain or strain and zero otherwise. Multiple injuries equals one if the injury is multiple injuries and zero otherwise. Event year equals the number of years between 1989 and the year the claim commenced. Expenses is the natural logarithm of settlement expenses. Policy type equals one if coverage is under a personal auto policy and equals zero if coverage is under a commercial auto policy.

claims on other sources. The result of the interaction, however, was insignificant, and it was excluded from the final model.

indicator variable suggests that modifications of these rules are associated with an increase in the average severity of scaled insured automobile liability insurance claims.

The data analysis provides statistical support for the hypothesis that caps on noneconomic damages are associated with a decline in average claim severity. Of all the reforms analyzed, caps on noneconomic damages had the largest impact, associated with a 62 percent reduction in average claim size. This result is consistent with intuition since caps reduce the expenses incurred by a defendant for such hardships as pain and suffering, bereavement, and other emotional traumas.

To assess the change in the average claim size indicated by reform of punitive damage statutes, we specify three variables as discussed above. Because the data represent insured claims, one important empirical issue is to control for punitive damage insurability in addition to indicating claims subject to punitive reform laws. We specify the interaction of these two phenomena since we expect the overall effect of punitive damage tort reform on individual loss to depend on the insurability of punitive damage claims. To evaluate the marginal impact of the punitive damage tort reforms on scaled claim size, partial differentiation of the empirical equation with respect to the punitive damages variable reveals that average insured liability claims are reduced by 40 percent when damages are insurable.¹⁵ Partial differentiation of the empirical equation with respect to insurable punitive damages indicates the marginal impact of the punitive damage insurability is associated with a 126 percent increase in the scaled average claim size when there has been no punitive damage tort reform (punitive damages equal zero). As expected, this increase is less dramatic when a punitive reform is in place—for example, the equation is evaluated with punitive damages equal to one, where the increase is lowered to 36 percent.

We find no support for the hypothesis that reform of the collateral source rule is associated with a decrease in average claim size. The coefficient was negative but not of statistical consequence. Collateral source reforms allow the introduction at trial of evidence that the plaintiff was compensated in whole or part for the loss by a third party. A variant of this reform calls for an automatic reduction of the trial award by any amount paid by a third party. Our finding of no statistically significant relationship between the reform rule and claim size may be due, in some circumstances, to plaintiffs neutralizing the reform by seeking higher noneconomic damages. Moreover, juries may not be sympathetic to evidence of third-party reimbursement. Finally, the addition of each minor reform is associated with a 10 percent decrease in average claim size.

The coefficients on the four no-fault indicator variables generally support the hypothesized relationship between average claim size and the presence of no-fault laws. Although we find no significant increase in average claim size in states with either verbal thresholds or higher dollar thresholds relative to tort states, we do find that lower dollar thresholds and add-on statutes are associated with higher average

¹⁵ Partial differentiation of the empirical equation reveals that the partial derivative of $\ln L$ with respect to the punitive damages variable equals 0.50349 (insurable punitive damages). Setting insurable punitive damages equal to one and exponentiating yields $(e^{0.50349} - 1) = -0.39558$.

claim sizes compared with average claim sizes in tort states, 27 percent and 115 percent, respectively.

The majority of control variables for injury type are highly significant. Relative to the benchmark, injuries involving fractures settle for the highest amounts, followed by those involving multiple injuries. The urbanization variable is positive and significant, indicating that average claim size is more severe in urban areas than elsewhere, consistent with our conjecture. The hypothesized sign of the coefficient on the unemployment rate is not statistically significant, suggesting no difference in the average claim settlements over different levels of unemployment. The sign of the coefficient on the event year variable is positive, revealing that average claim size is larger the greater the number of years between the occurrence date and the final settlement. Older claims remain unresolved because parties cannot agree on an acceptable settlement. In many cases, the dispute arises over the value of intangible losses such as pain and suffering, claims that are complicated and costly.

The final two variables, policy type and expenses, have estimated coefficients that are statistically significant with the hypothesized sign. The negative coefficient on the policy type variable supports the findings by Chin and Peterson (1985) that claims and settlements against business entities are greater than similar claims against individuals. The positive coefficient on the expenses variable shows that higher administrative costs are associated with higher average net claim sizes, consistent with the hypothesis that injured parties seek higher awards to compensate for these costs.

CONCLUSION

Utilizing a large sample of individual bodily injury liability claims from 21 states and controlling for a variety of environmental, economic, and claim-specific factors associated with claim severity, we find evidence on the association between various statutory rules and attorney involvement on individual automobile liability claim severity generally consistent with our expectations. Attorney involvement and the presence of low dollar thresholds and add-on no-fault rules are associated with an increase in average individual claim size. With the exception of the joint and several liability rule, the major tort reforms of the 1980s were associated with a reduction in average claim size for personal injury claims supported by insurance coverage.

Additional research is needed on the welfare effects of tort reform. The decreased costs imposed by the liability system on defendants may result in an increase in tortious conduct. This would occur if the tort reforms result in a decrease in deterrence. Tort reform may also result in aggrieved parties receiving less-than-complete compensation for the injuries incurred. For instance, reform of joint and several liability rules requires an injured party to bring legal actions against each party responsible for a loss. The cost of bringing such actions may be prohibitive. Although our study addresses the effect of tort reform on insured settlements, the issue of tort reform is replete with thorny questions pertaining to

what is, just. These questions are important, but go beyond what we are able to address in this article.

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