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INVITED ARTICLE

TORT REFORM AND INSURANCE MARKETS

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ABSTRACT

Proposed tort reforms have focused on punitive damages and noneconomic damages, each of which pose problems for jury decision making. The U.S. Supreme Court decision in *State Farm* v. *Campbell* will greatly limit very large punitive damages awards, and will affect smaller punitive awards to a lesser degree. Noneconomic damages caps enacted by state legislatures have greatly enhanced insurance market performance. Insurers operate within the context of a highly imperfect, regulated market in which there is substantial price rigidity induced by regulation. Reform efforts should strive to establish greater predictability and stability in these awards components rather than simply being concerned with imposing specific numerical caps.

TORT REFORM TARGETS

The tort liability crisis in the mid-1980s witnessed a dramatic increase in insurance premiums and denials of insurance coverage. In an effort to provide greater stability to insurance markets and to reduce liability costs, most states enacted some kind of tort reforms in the 1980s. These reforms often took the form of damages caps and limitations on liability.

Recent increases in insurance premiums have stimulated interest in enacting some kind of tort reform. Unlike the 1980s liability crisis, current problems seem to stem less from denials of coverage than from increases in premium rates. However, as with the liability crisis of the mid-1980s, the focus has been on lines of insurance such as general liability, products liability, and medical malpractice. These lines have continued to exhibit premium increases. Medical malpractice premiums increased by 8.7 percent in 2001 and by 9.5 percent in 2000, and product liability premiums jumped by 42.6 percent in 2001, after exhibiting a decline of 10.4 percent in 2000.[1]

Proposed reforms have focused primarily on two damages components: noneconomic damages, such as pain and suffering, and punitive damages. Are reforms of either of

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[1] These statistics are from the Insurance Information Institute (2003), pp. 73-74.

these components of damages sensible? Whether reforms are desirable hinges on two different sets of concerns. First, to what extent are reforms warranted based on the criteria for these damage components and the performance of the courts with respect to these damages awards? Second, which types of reforms will best foster insurance market performance while at the same time maintaining the constructive role that such damages components may play in the judicial system? As I will show in this article, punitive damages and noneconomic damages share common limitations and should be prominent targets of reform, but the character of the reforms that have been proposed to date often are not ideal. Past proposals have been designed strictly with respect to the narrow objective of reducing insurance costs, which is not necessarily equivalent to fostering sound insurance market performance.

WHY JURIES DON'T DO WELL: PAIN AND SUFFERING

The principal noneconomic damages component comes under the general heading of pain and suffering. Thus, in addition to compensating accident victims for lost earnings, medical expenses, rehabilitation costs, and similar out-of-pocket outlays, there is generally an additional provision for the pain and suffering associated with the injury or fatality. Unfortunately, the criteria for setting these awards are quite vague. In particular, the jury instructions never provide any precise guidance that would enable one to set the pain and suffering amount based on any kind of compensatory principles or formulas. While one could distinguish possible approaches to setting pain and suffering damages that would be amenable to greater precision and predictability, none of these approaches has been adopted in any existing jury instructions for pain and suffering.

Three possible formulations can be distinguished. First, accident victims could be compensated for the optimal insurance value of their injury. Based on this approach, the jury would engage in the thought experiment of how much insurance the accident victim would have chosen to provide after the accident if offered the opportunity to buy such insurance on an actuarially fair basis before the accident. However, available evidence indicates that accidents generally reduce the marginal utility of income so that the optimal insurance amount after an accident would be zero.[2] The underlying rationale for this result is that if the accident impedes one's ability to derive utility from expenditures, as in the case of ailments such as quadriplegia, then it would not be desirable to shift funds from the healthy state to the injured state through the purchase of insurance.

The second formulation that might be adopted to set pain and suffering awards is the optimal deterrence value. This approach would set the pain and suffering amount at a sufficiently high level that the party causing the accident had efficient incentives for accident avoidance. Accidents entailing pain and suffering losses as well as monetary losses presumably should be deterred to a greater extent than should accidents in which there is only a monetary loss alone. Such deterrence is generally the province of punitive damages rather than pain and suffering awards.

The underlying difficulty is that there is always a fundamental tradeoff that must be confronted. The optimal insurance value provides for too little deterrence, while the

[2] For documentation of this reduced marginal utility of income on an empirical basis, see Viscusi (1998).

optimal deterrence value provides for excessive levels of insurance. No award in personal injury cases can simultaneously produce optimal deterrence and optimal insurance.

The final approach that one could take is the amount of compensation that would make the accident victim "whole" after the accident. This approach leads to efficient levels of compensation in the case of accidents that involve only financial losses, but leads to excessive levels of insurance for pain and suffering losses. What, for example, is the amount of money that Christopher Reeve would require to bring him back to the same level of welfare that he had before being paralyzed?

WHY JURIES DON'T DO WELL: PUNITIVE DAMAGES

The problems with punitive damages are in many respects similar to those with respect to pain and suffering. If juries decide to award punitive damages because of reckless or malicious behavior, then there is no structure given to them by the punitive damages instructions to enable them to assess the awards in a meaningful manner. As a result, there is evidence that juries have a very consistent sense of when behavior is particularly egregious, but they are less able to map these concerns into dollar values of awards.[3]

From a law and economics perspective, one could establish punitive damages that generated optimal deterrence amounts by setting total damages equal to the harm that has been caused divided by the probability of conviction. The total of the compensatory award plus the punitive award should be such that when multiplied by the probability of conviction it just equals the harm inflicted. Thus, in situations in which there is a 50 percent chance of conviction, the total penalty should consequently be double the value of the harm, which is typically the compensatory award.[4]

Whereas, the underlying theory for setting optimal levels of punitive damages is straightforward, there is a considerable gap between the theory and actual practice. This optimal deterrence approach is not included in any existing punitive damages instructions. One barrier to adopting this approach may be that many people do not believe that it is reasonable to boost the penalty level simply because the probability of conviction is low. Should, for example, taxpayers be subject to a doubling of penalties if the Internal Revenue Service chose to cut in half the number of auditors for that state? In an experimental test of jury instructions modeled on the law and economics approach to optimal punitive damages, I found that juries either will not or cannot implement these instructions.[5] Indeed, even when given precise numerical instructions that involve little more then addition and multiplication, jurors tended to ignore these instructions and chose instead to focus on the same kinds of anchoring influences and other criteria that currently govern punitive damages awards in situations where optimal deterrence instructions are not given.

Jurors make a variety of systematic errors. Juries are sensible with respect to judgments regarding fault, but juries are very bad at mapping these concerns into dollar penalty

[3] For a series of experimental studies of jury behavior with respect to punitive damages, see Sunstein et al. (2002).

[4] For a detailed advocacy of this approach, which dates back to Jeremy Bentham, see Polinsky and Shavell (1998). Also see Schmit, Pritchett, and Fields (1988) more generally for discussion of the rationales for punitive damages.

[5] See Viscusi (2001b) for a report on the performance of a large sample of adult respondents.

amounts. Another difficulty is that of hindsight bias. Jurors perform very poorly in taking themselves back to the informational conditions before the accident and making judgments as to what the defendant did or did not know at that point in time. By assuming the party that caused the accident had superior knowledge before the accident that the adverse outcome would occur, jurors tend to overstate the extent to which there is deliberate disregard for safety in such situations. Such biases are particularly acute when the company has done a risk analysis and chosen a product design that could have been safer, albeit at a perhaps much greater cost. Jurors also may succumb to anchoring effects in which the plaintiff's attorneys provide numerical guidance to jurors as to what the punitive damages amount should be so as to provide a numerical crutch for juries to select a dollar penalty amount. Such guidance could be the advertising budget for the firm, the profits the firm would make in that state over the next decade, or some other accounting measure that bears no relationship whatsoever to any sound theory of punitive damages.

One possible remedy of the difficulties with respect to punitive damages is to transfer greater authority over setting these amounts to judges and to restrict jurors to deciding when punitive damages are warranted. My evidence with respect to the comparative performance of judges and jurors indicates that judges are less prone to the kinds of biases that contaminate juror behavior. Judges are better at risk assessment, less prone to hindsight bias, and generally are more likely to perform in a manner that is consistent with efficient incentives for deterrence.[6]

EMPIRICAL ASSESSMENTS: PAIN AND SUFFERING

Determining the magnitude of pain and suffering compensation and whether such compensation is increasing over time is difficult because there is seldom a reporting of the pain and suffering amounts in most court case databases. There is, however, a sense that pain and suffering awards are increasing and, at times, random. For the most part, these assessments are based on anecdotal evidence combined with the observed pattern of increasing insurance premiums.

However, actual empirical evidence with respect to the performance of pain and suffering damages suggests that the process of setting these awards is not entirely random.[7] Using as the measure of pain and suffering compensation the difference between the total compensatory damages award and the compensation for economic damages, I found that there is no uniform markup of the compensatory award to account for pain and suffering. Thus, jurors do not simply multiply the compensatory award by some factor, such as 1.5. The pain and suffering compensation is greater for accidents in which there is a larger economic damages amount, but the elasticity of the responsiveness of pain and suffering damages to the compensatory damages amount is less than one. More severe injuries do in fact receive more pain and suffering compensation, which is what one would expect if juries were behaving reasonably. Thus, situations of paraplegia and catastrophic burn injuries receive greater pain and suffering compensation amounts than do temporary poisonings.

[6] See Viscusi (1999, 2001a, 2001b) for a comparison of the performance of judges and juries.

[7] This analysis is based on an examination of over 10,000 closed products liability claims reported in Viscusi (1991).

Despite these systematic elements, there are some clearly erratic awards for pain and suffering amounts that have attracted considerable press attention, such as with respect to the burn injuries from hot McDonald's coffee. Even if such awards are ultimately reduced or overturned, they do highlight the underlying difficulty with respect to setting pain and suffering awards, which is that juries simply are not given any guidance that would enable them to set these award amounts in a manner that would be consistent across cases and bore any relationship to any of the theories with respect to how pain and suffering awards should be established.

EMPIRICAL ASSESSMENT: PUNITIVE DAMAGES

The evidence with respect to trends in punitive damages is more dramatic. To date, I have been able to identify 63 blockbuster awards of $100 million or more, many of which are for personal injury or environmental torts.[8] Very few of these major awards are for medical malpractice or related problems such as pharmaceutical liability so that for medical malpractice insurance, restrictions on noneconomic damages will loom as a more important concern than restrictions on punitive damages.

Of the 63 blockbuster punitive damages awards, 60 have been by juries, with only three resulting from bench trials. The general sense that the problems of excess punitive damages awards can be traced to jury behavior is not mistaken. The total of these 63 blockbuster awards is for $214.4 billion, of which $210.5 billion has been awarded by juries and $3.9 billion has been the result of bench trials.

Table 1 provides a summary of the 11 punitive damages awards that have been for at least $1 billion. The only bench trial that led to a billion dollar punitive damages award was a light cigarettes class action in Illinois. This 2003 trial took place in a plaintiff-oriented venue—Madison County, Illinois. An ongoing concern with respect to class actions is whether plaintiffs search out favorable forums for these cases that would have dimmer prospects if litigated elsewhere. The roster of billion dollar punitive awards for jury cases also includes several cigarette cases as well as environmental damages cases such as that pertaining to the *Exxon Valdez* oil spill and a personal injury case stemming from a rear impact crash that produced nonfatal burn injuries among occupants of a General Motors vehicle.

While the punitive damage amounts are substantial, the cost of these punitive awards usually is borne by the defendant companies rather than an insurer. Awards often are not covered by insurance, in part due to restrictions in some states prohibiting insurance of punitive damages. In addition, the defendants in such blockbuster award cases usually are large companies, which may self-insure. Though it is also true that many of these awards are reduced or overturned on appeal, the prospect of large awards may induce settlements, including for cases that have not yet gone to trial but in which a similar punitive damages award is anticipated. Moreover, the potential for appeal may be limited. In the case of the $10 billion total award in *Miles v. Philip Morris Inc.*, during the appeals process the company must post a bond of $12 billion to cover the award amount of $10.2 billion plus interest. As of this writing, posting this amount is not feasible for the company, and it is seeking to have the bond amount reduced, thus far without success.

[8] This compilation is drawn from Hersch and Viscusi (2003).

TABLE 1
Summary of Punitive Damages Awards of at Least $1 Billion

Case Name	Year of Decision	Punitive Damages Award ($ millions)	Compensatory Damages Award ($ millions)	Ratio of Punitive Damages to Compensatory Damages
Bench Punitive Awards *Miles v. Philip Morris Inc.* (Illinois)	2003	3,100.00	7,100.00	0.4
Jury Punitive Awards *Cowart v. Johnson Kart Manufacturing Inc.* (Wisconsin)	1999	1,000.00	24.00	41.7
Grefer v. Alpha Technical Services Inc. (Louisiana)	2001	1,000.00	56.13	17.8
Hayes v. Courtney (Missouri)	2002	2,000.00	225.00	8.9
Pennzoil Co. v. Texaco Inc. (Texas)	1985	3,000.00	7,530.00	0.4
Boeken v. Philip Morris Inc. (California)	2001	3,000.00	5.54	541.5
In re: New Orleans Tank Car Leakage Fire Litigation (Louisiana)	1997	3,365.00	2.00	1,682.5
Exxon Corp. v. Department of Conservation and Natural Resources (Alabama)	2000	3,420.00	87.70	39.0
Anderson v. General Motors Corp. (California)	1999	4,775.00	107.60	44.4
In re: The Exxon Valdez (Alaska)	1994	5,000.00	287.00	17.4
Bullock v. Philip Morris Inc. (California)	2002	28,000.00	0.65	43,076.9
Engle v. R.J. Reynolds Tobacco Co. (Florida)	2000	145,000.00	12.70	11,417.3

Source: Adapted from Table 1 of Hersch and Viscusi (2003).

WHAT LEGAL REFORMS MAKE SENSE?

The legal reforms that one might take with respect to these two different damages components differs. With respect to pain and suffering awards, most states enacting reforms have chosen to impose a specific dollar damages cap, such as a $250,000 limit on pain and suffering awards. While such caps impose discipline on juries, they may be unduly rigid with respect to the differential incidence that such caps will have across cases of different severity.

By imposing a fixed upper limit on the dollar value of pain and suffering awards, strict dollar caps on pain and suffering may lead to underinsurance of the economic loss incurred by the plaintiff. Suppose, for example, that the plaintiff has a normal contingent fee arrangement in which one-third of the award goes to the attorney. If the total

value of compensatory damages is $3 million, then $1 million of that amount will be for attorney fees. In the normal course of events, the pain and suffering compensation provides the leeway for plaintiffs to pay their legal fees, while at the same time retaining enough of the award amount to cover their actual economic losses. To avoid underinsurance that would result if these economic losses were not covered, pain and suffering reform efforts should accommodate the need to provide for reasonable legal fees while at the same time providing some guidance and limitation on pain and suffering amounts.

One possible reform that would achieve this objective was proposed by an American Law Institute (1991) group in which I was an associate reporter. Their proposal was that there be a schedule for pain and suffering damages, but that there also be provisions made for the plaintiff's attorney's fees. Scheduling or some other kind of financial limitation on pain and suffering would be sensible, although the precise dollar amounts that should go into such schedules must be determined. However, by also providing for attorney's fees, these reforms will simultaneously address the problem that damages caps generate in that they may lead to underinsurance of the economic loss associated with an accident once legal fees are paid. This reform proposal also would promote greater predictability and restraint of pain and suffering awards.

The recent limits on noneconomic claims for medical malpractice cases approved by Texas voters are not as restrictive as most caps. However, this effort might have been enhanced by more detailed scheduling of damages. The Texas law limits noneconomic damages to $750,000 per case—a maximum of $250,000 from the doctor and an additional $500,000 from hospitals and health care providers.[9] Such limits do little to restrain the great preponderance of all pain and suffering awards, which will generally be below the cap. For awards that are in excess of $2.25 million, there will be some loss in funds to cover attorney's fees if the contingency fee share is one-third. An alternative approach that might merit consideration would be to have limits that pertain to the entire range of pain and suffering awards, not just the large awards, and couple these limits with some provision for reasonable attorney's fees.

With respect to punitive damages, the most forceful reform effort has been that undertaken by the U.S. Supreme Court in 2003. In the *State Farm v. Campbell* case, the Court offered its most definitive guidance to date with respect to the appropriate level of punitive damages awards. In the normal course of events, the Court would not expect punitive awards to exceed the value of the compensatory damages award, and at the maximum such punitive damages awards should not be more than nine times greater than the compensatory damages award.

How effective would such limits be in restraining punitive damages awards can be ascertained by examining two different sets of case data shown in Table 2. The first set of results consists of a comprehensive sample of 63 blockbuster punitive damages awards of $100 million or more, while the second data set consists of a nationally representative state court sample of cases in 1996. As is evident from the first row in the table, the total dollar magnitude of the blockbuster awards greatly exceeds the tally for the state

[9] See Ralph Blumenthal, "Malpractice Suits Capped at $750,000 in Texas Vote," *New York Times*, September 15, 2002, p. A12.

TABLE 2
What Legal Reforms Make Sense?

Effect of Ratio Limits on the Amount of Punitive Damages Awards

Ratio Limit	Blockbuster Awards	State Court Sample, 1996
9	$14.2 billion	$104.5 million
1	$6.6 billion	$15.1 million
Total	$214.4 billion	$245.9 million

The Share of Punitive Damages Cases Affected by Ratio Limits

	Percentage of Cases Under the Limit	
Ratio Limit	Blockbuster Awards	State Court Sample, 1996
9	43	96
1	8	71

court sample. In each instance, imposing a ratio limit that the punitive award cannot be more than nine times the value of the compensatory damages award has a significant restraining effect, but the influence is much greater for the blockbuster awards that drop from $214.4 billion to $14.2 billion once this limit is imposed. In contrast, the state court awards are reduced by just over half of their amount by such a limit. If, however, the limit imposed is that the punitive award cannot exceed the compensatory damages award, the amount of blockbuster awards is reduced even further to $6.6 billion, and the total punitive awards in the state court sample drops to only $15.1 million.

The bottom panel of Table 2 indicates the fraction of awards that would be permitted to continue if these restraints were imposed. The blockbuster awards are affected to a much greater extent, as only 8 percent of such awards would be permitted if the magnitude of the punitive award could not exceed the compensatory damages award. However, for the state court sample, in which the awards tend to be less extreme, 71 percent of the awards would survive the test that the punitive award could not exceed the compensatory damages award. Thus, the share of cases affected by such a limit would be less than the majority for the state court sample, even though the total magnitude of awards that would be eliminated by this strict guideline would be considerable.

WILL LEGAL REFORMS MATTER?

To assess how various kinds of legal reforms will affect insurance markets, Patricia Born and I have examined the influence of several reform variables on measures of insurance market performance.[10] The focus of our analysis was on medical malpractice insurance over the 1984-1991 period. Using a comprehensive data set on individual insurance companies by state by year, we found a variety of results that are instructive with respect to the effect of reform efforts on this line of insurance.

[10] The most recent of our efforts is Viscusi and Born (2002).

Pain and suffering caps, or more specifically, caps on noneconomic damages, have a clearly substantial effect on insurance losses.[11] The emphasis of the recent medical malpractice reform effort on limiting noneconomic damages amounts was not accidental. Such reforms have a dramatic effect on the value of losses experienced by insurers in states enacting such reforms. Moreover, the distribution of these influences is of interest as well. The firms that otherwise would have experienced the largest losses are the greatest beneficiaries of noneconomic damages caps. Thus, the role of such limitations is to reduce the outliers among losses, which is attractive to insurance companies, which ideally would like to have predictable losses that do not veer to extreme and unpredictable amounts.

The role of various punitive damages reforms for medical malpractice is significant but less influential, in part because medical malpractice has not been the main area in which punitive damages have played a dominant role. What does appear to matter is whether punitive damages are insurable in that particular state. States that prohibit the insurability of punitive damages or that prohibit punitive damages altogether have lower levels of losses, controlling for other aspects of insurance. These limits on insurability will in fact reduce medical malpractice losses, but not as much as would noneconomic damages reforms. As with the noneconomic damages limits, however, the effects of such restraints also tend to be concentrated among the firms that otherwise would have experienced the largest losses. Once again, it is the loss extremes that tend to be affected most by punitive damages limits, which is consistent with the general sense that these awards contribute to the substantial volatility of losses in the absence of some form of restraint.

WHY SHOULD INSURERS CARE?

Most liability reforms generally reduce the losses incurred by insurers, which is a change that insurers generally welcome. But what if such policies were taken to the extreme by abolishing tort liability altogether? Losses would be reduced, but there would be no market for insurance. The potential puzzle consequently is why insurers should have such a strong interest in cost reducing efforts and why trade associations acting on behalf of insurers, such as the Alliance of American Insurers, have often supported various tort reform efforts given that such reforms reduce the potential market for insurance.

One major reason for this support is that insurance markets are not perfectly flexible and do not adapt in the same way as would be expected in an idealized economic model. Rather, insurance is a highly regulated market in which there is substantial price inflexibility due to this regulation.

To demonstrate the influence of price inflexibility, I will examine the data from 1981-1984 period of intense price competition that took place before the major tort liability crisis that occurred from 1984-1986. For this time period I will analyze what I believe is a unique data file based on the Insurance Services Office (ISO) ratemaking files for product liability bodily injury coverage. The unit of observation is the individual insurance policy

[11] Similarly, noneconomic damages caps reduce the rate of case filings, which in turn will affect losses. See Schmit, Browne, and Lee (1997) and Browne and Puelz (1999).

TABLE 3
Regression Results for Insurance Equations

	Ln(Manual Rate)[a]	Ln(Premium Rate)[b]	Ln(Exposure)[b]	Ln(Premiums)[b]	Ln(Loss Ratio)[b]
Independent Variables (Standard Errors in Parentheses)					
Intercept	9.645*	−5.892*	14.171*	−7.396*	−6.271*
	(0.140)	(0.160)	(0.318)	(0.324)	(0.400)
Ln(Manual Rate)	—	0.677*	−0.782*	0.113*	—
		(0.006)	(0.014)	(0.013)	
Ln(Product $Loss_{it-1}$/ Product $Exposure_{it-1}$)	0.169*	0.067*	0.036*	0.104*	—
	(0.024)	(0.003)	(0.006)	(0.006)	
Ln(State $Loss_{it-1}$/ State $Exposure_{it-1}$)	0.008*	−0.001	0.220*	0.223*	—
	(0.003)	(0.003)	(0.008)	(0.007)	
Ln Wage	0.204*	−0.196*	1.035*	0.837*	0.761*
	(0.040)	(0.042)	(0.093)	(0.085)	(0.114)
Regulation	−0.129*	0.309*	−1.628*	−1.356*	−0.242*
	(0.030)	(0.031)	(0.070)	(0.064)	(0.086)
Ln Real Treasury Bill Rate	0.404*	0.048	0.088	0.517*	−1.098*
	(0.059)	(0.063)	(0.068)	(0.126)	(0.175)
Adj. R^2	0.35	0.51	0.24	0.15	0.06
N	28,350	27,759	27,762	27,759	43,063
Detailed Insurance Regulation Variables					
Modified/Prior Approval	−0.128*	0.297*	−1.418*	−1.145*	−0.065
	(0.031)	(0.033)	(0.073)	(0.066)	(0.089)
Flex Rating	−0.119*	0.320*	−1.369*	−1.072*	−0.430*
	(0.032)	(0.034)	(0.075)	(0.068)	(0.092)
File & Use/Use & File	−0.133*	0.311*	−1.874*	−1.612*	−0.270*
	(0.031)	(0.032)	(0.071)	(0.065)	(0.087)

[a]The regression equation also includes a set of 37 product group dummy variables.
[b]The regression equation also includes a set of 41 product group dummy variables.
*Indicates coefficients that are statistically significant at the 5% level, two-tailed test.

written for a particular company. The sample size is quite large, ranging roughly from 7,000 to 11,000 policies for any particular year. The Appendix to this article provides a more detailed analysis of the underlying theory behind these regressions.

Table 3 provides regression results for a series of insurance equations. The first regression focuses on the determinants of the natural logarithm of the manual rate for the particular five-digit class of products sold in the state. The manual rate serves as the price guideline set by the state insurance commissioners for each product group, though insurance

underwriters are permitted to deviate from the manual rate, such as for firms with particularly good loss ratios.

The first explanatory variable in the manual rate equation is the natural logarithm of the product loss for that product i in the previous period $t - 1$ divided by the exposure level, which is the dollar value of the sales covered by insurance.[12] This variable captures the losses per unit of coverage of insurance being written. As one would expect, increases in losses per unit of coverage raise the manual rate.

Similarly, states in which policies have a high loss amount per unit of exposure also have higher manual rates for that product in the state. High wage levels, which in turn will increase the cost associated with losses, have a positive effect on the manual rate as well. The equation also includes a measure of the Treasury bill rate as well as a series of 37 product group dummy variables to control for product-specific differences in insurance rates.

The main variable of interest in the manual rate equation is that for regulation. States in which there is insurance regulation have lower manual rates than states that do not. Indeed, this result is true not only for regulation overall, but also holds for each of the three different forms of regulation that are distinguished in the bottom panel of Table 3—modified prior approval or prior approval states, states with flex rating in which prior approval is required for large rate changes, and file & use/use & file states in which approval is required either before or after instituting a new rate. In every instance, the results with respect to the manual rates are consistent with the price restraining effects of regulation.

The regression results for the premium rate equation have somewhat different implications. The measure of insurance prices that will be used here is the ratio of premiums to the number of exposure units for the particular product, thus being a measure of actual prices charged rather than simply the price guidance under the manual rate. What is evident in these results is that regulation does not have a price restraining effect in terms of actual prices charged. Rather, the effect of regulation is to boost the actual price charged for insurance. Thus, we observe a result opposite of what might be intended, but an effect that that is in line with economic theory, as shown in the Appendix.

It is noteworthy that the 1981-1984 period is generally considered as a period of intense price competition in which insurers lowered prices. These results indicate that insurers in regulated states lowered their prices to a lesser extent. An explanation for this effect is that regulation boosts the adjustment costs associated with subsequently increasing prices. Firms will consequently decrease prices in regulated states less during periods of price competition because of the greater costs of raising prices when market conditions change. Thus, insurance regulation has led to downward price rigidity during periods of intense price competition. Regulation has not simply restrained manual rates, which is the intended effect of insurance regulation.

[12] The average losses experienced under each of these policies represents the losses to date and the additional losses expected to occur for policies written in that year. The loss projections are made using the ISO development factors. The value of losses is highest in 1983 and 1984, which was just before the emergence of the perceived liability crisis.

As one would expect, these various interferences with the functioning of markets have ramifications for other aspects of insurance market performance. Because insurance regulation leads to higher premium rates actually being charged for insurance, one would expect the quantity of insurance purchased to be reduced by regulation. That quantity effect did occur, as is shown by the results for the log insurance exposure variable, which reflects the dollar volume of sales that is being covered by insurance. The combined influence of insurance regulation on prices and quantity is reflected in the premium regressions. As is shown by the results in Table 3, insurance regulation decreases the total value of premiums written in the state.

For this time period, insurance regulation does reduce the loss ratio of insurers, where the inverse of the loss ratio is the usual measure of insurer profitability. This influence on loss ratios is a significant effect for all forms of regulation other than prior approval or modified prior approval regulation. In situations in which regulation leads to quantity rationing, one would expect firms to respond to the constraint by restricting coverage to exclude the higher risks and to provide coverage to the more favorable risks. The result is that insurance should become more profitable, thus lowering loss ratios because the mix of risks insured by the firm has changed.

Because insurance regulations induces price inflexibility, it is difficult for insurers to respond to changing and increasing liability costs. Insurance ratemaking tends to be based on observed frequencies of risk occurrences. Risks that vary substantially over time and are difficult to estimate as well as risks that are increasing over time will tend to pose particular problems for the ratemaking process. The same kinds of difficulties posed by legal uncertainties created by punitive damages and pain and suffering awards have also been identified as instrumental factors in undermining insurance market responses to terrorism risks, as demonstrated in recent work by Cummins and Lewis (2003) and Doherty, Lamm-Tennant, and Starks (2003). What these articles have shown is that uncertainty in the key parameters pertaining to terrorism risks, rising costs, and unpredictable costs have greatly impeded insurance market responses to this class of hazards. These problems are identical to caused by the punitive damages and noneconomic damages awards.

A major reason why these complications are so fundamental is that the insurance market functioning is grounded in classical statistics based on actual insurance experiences rather than a Bayesian approach that can respond more quickly to judgmental shifts in risk.[13] This link to actual insurance experience is especially acute in regulated states where rates must be justified based on past performance indices.

POLICY PRESCRIPTIONS

Noneconomic damages have been at the forefront of reform efforts largely because of their major role for medical malpractice insurance. Punitive damages are potentially more explosive and pose a greater threat both to insurers as well as to the companies that are defendants in these cases. The era of million dollar awards has now given way to an era of billion dollar awards. These highly publicized billion dollar verdicts may increasingly serve to anchor awards in future liability cases.

[13] In Viscusi (1993), I examine the role of classical statistics and insurance market volatility in affecting insurance markets.

In the case of punitive awards, the U.S. Supreme Court has been the primary institution imposing more structure on these awards, thus filling a void that tort reform has not addressed. How the guidelines for punitive awards specified in *State Farm v. Campbell* will actually influence the punitive awards that are observed is not yet clear, but certainly there will be some evident future restraint resulting from this decision.

Both noneconomic damages and punitive damages share common difficulties that cannot be fixed easily. Rigid caps on these awards limit costs but do not solve the underlying problem with these awards. Put simply, juries have been given an impossible task in setting those damages levels. The guidelines provided in the jury instructions provide no firm guidance for setting these award amounts in a reliable, predictable manner. It would be desirable to have additional structure at the award stage rather then arbitrary discipline after the fact. The ideal solution is to have juries or judges set those awards in a responsible manner rather than to respond after the fact by imposing caps on award levels. From the standpoint of insurance market performance, the major need is for increased stability and predictability of awards levels. The more narrowly framed objective of keeping awards low is not necessarily in insurers' interest since it eliminates a potential market for insurance.

Thus, in many respects the focus of reforms on rigid caps, which in the extreme case would totally eliminate these award components, may be misdirected if the objective is to foster a sound environment for insurance underwriting. Having stable and predictable awards for noneconomic damages and punitive damages should be the objective. Improvements of that nature would benefit the insurance industry by providing an opportunity to write coverage for a major class of financial risks that firms face. Reforms that provide for the scheduling of noneconomic damages coupled with provision for attorney's fees would not only protect the interests of plaintiffs and provide for the kind of stable and predictable losses that are amenable to being insured, but would also receive greater support from the plaintiff's bar. Reform proposals that would cap noneconomic damages at low levels will impinge on the plaintiff's ability to cover legal fees, which in turn will also affect the adequacy of the award in addressing the economic losses associated with the case.

The need to make allowances for attorney's fees in reforms of punitive damages is not necessary because the provision for noneconomic damages and compensatory damages would generally provide adequate compensation. The U.S. Supreme Court decision may do a great deal to limit the most dramatic outliers in punitive damages awards. Additional fine tuning of punitive damages reforms ideally should reflect the underlying potential rationales for punitive damages and not be concerned solely with cost reduction.[14]

APPENDIX: THE ECONOMETRIC MODEL

The empirical analysis focuses on a situation in which there has been a reduction in costs facing the firm, as there was in 1981-1984. The econometric formulation utilizes a

[14] Among these potential factors is whether there should be a regulatory compliance defense in punitive damages cases. If firms are, for example, in compliance with specific government health and safety regulations with respect to their product, then presumably their safety decisions should not be designated as being reckless by jurors.

reduced-form model of the insurance market. The demand D for insurance is a function of its price P and some vector of other variables X, and the supply of insurance is governed by the price P and a vector of variables Y, and by government regulation (REG). All variables below other than REG are in logarithms.

The demand curve is consequently given by

$$D = \alpha P + \beta X + \varepsilon, \tag{A1}$$

and the supply curve is

$$S = \gamma P + \psi Y - \xi \text{REG} + u, \tag{A2}$$

where ε and u are random error terms. One would expect $\alpha < 0$, $\gamma > 0$, $\xi > 0$, and β and ψ have ambiguous signs depending on their influence on supply and demand.

The market clearing conditions are that the quantity of insurance sold should equate demand and supply, recognizing that there will be a disequilibrium gap caused by regulation, ξREG, or

$$\alpha P + \beta X + \varepsilon = \gamma P + \psi Y - \xi \text{REG} + u. \tag{A3}$$

Solving for P, one obtains

$$P(\alpha - \gamma) = \psi Y - \beta X - \xi \text{REG} + u - \varepsilon, \tag{A4}$$

and letting $u' = (u - \varepsilon)/(\alpha - \gamma)$, one obtains

$$P = \frac{\psi Y}{\alpha - \gamma} - \frac{\beta}{\alpha - \gamma} X - \frac{\xi}{\alpha - \gamma} \text{REG} + u'. \tag{A5}$$

This reduced-form price equation consists of three terms in addition to the random error term. The coefficient $\psi/(\alpha - \gamma)$ on Y will have the opposite sign of ψ in the supply equation. Similarly, the coefficient $\beta/(\alpha - \gamma)$will have the opposite sign of the β term in the demand equation, though the influence of this term is reversed because it enters negatively into the reduced-form price equation. Finally, the main coefficient of interest is that $\xi/(\alpha - \gamma)$ is predicted to be negative, and since this term enters negatively into the equilibrium price equation the net effect is that in regulatory contexts one would expect there to be a higher price for insurance.

In similar fashion one can derive the reduced-form quantity equation. One can rewrite Equations (A1) and (A2) as

$$P = \frac{Q}{\alpha} - \frac{\beta}{\alpha} X - \frac{\varepsilon}{\alpha} \tag{A6}$$

and

$$P = \frac{Q}{\gamma} - \frac{\psi Y}{\gamma} + \frac{\xi}{\gamma} \text{REG} - \frac{u}{\gamma}. \tag{A7}$$

If we let, $\varepsilon' = [\frac{\alpha\gamma}{\alpha-\gamma}][\frac{u}{\gamma} - \frac{\varepsilon}{\alpha}]$, then we obtain

$$Q = \frac{-\gamma\beta}{\alpha-\gamma}X + \frac{\alpha\psi}{\alpha-\gamma}Y - \frac{\alpha\xi}{\alpha-\gamma}\text{REG} + \varepsilon'. \tag{A8}$$

In this reduced-form quantity equation, the value of $\gamma/(\alpha - \gamma)$ is negative, but this term enters negatively into the quantity equation so that the net effect of the X variables is to have the same sign as β in the demand equation. Similarly, the net effect of the $\alpha\psi/(\alpha - \gamma)$ term is that Y has the same effect on the quantity demanded as these variables do in the supply equation. Factors that increase supply of insurance or its demand will consequently increase the quantity of insurance purchased in this reduced-form equation. Finally, the value of $\alpha\psi/(\alpha - \gamma)$ will be positive, but since this term enters negatively in Equation (A8), government regulation reduces the quantity of insurance purchased. Thus, the two main empirical predictions that will be tested are that regulation will raise insurance prices and lower the quantity purchased.

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