TORT REFORM AND ACCIDENTAL DEATHS

Paul H. Rubin and Joanna M. Shepherd

Abstract: Theory suggests that tort reform could have either of two impacts on accidents. First, reforms could increase accidents as tortfeasors internalize less of the costs of externalities, and thus, have less incentive to reduce the risk of accidents. Second, tort reforms could decrease accidents as lower expected liability costs result in lower prices, enabling consumers to buy more risk-reducing products such as medicines, safety equipment, and medical services. We test which effect dominates by examining the effect of tort reforms on non-motor vehicle accidental death rates, using panel data techniques. We find that caps on noneconomic damages, caps on punitive damages, a higher evidence standard for punitive damages, product liability reform, and prejudgment interest reform lead to fewer accidental deaths, while reforms to the collateral source rule lead to increased deaths. Overall, the tort reforms in the states between 1981-2000 have led to an estimated 14,222 fewer accidental deaths.

Paul H. Rubin
Department of Economics and School of Law
Emory University
Atlanta, GA 30322
404-931-0493
prubin@emory.edu

Joanna M. Shepherd
Emory University School of Law
Gambrell Hall
Atlanta, GA 30322-2770
(404) 727-8957
jshepherd@law.emory.edu

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I. Introduction

Classical law and economics analysis of tort law treats torts as externalities. A well-functioning legal system creates incentives for potential tortfeasors to internalize the costs of the externalities by making them liable for damages if a tort actually occurs. This leads to efficient behavior under many circumstances (Brown, 1973; Landes and Posner, 1987; Shavell, 1987, 2004). As a result, any "tort reform" that reduces the scope of liability could increase accident risk as potential tortfeasors internalize fewer costs.[1]

However, this premise depends on numerous assumptions. These include: damages are pecuniary, not non-pecuniary; injurers and victims are strangers, and not in any pre-accident contractual relationship; the system operates costlessly; and actions of tortfeasors are harmful, not protective. As modern liability has expanded to include product liability and medical malpractice, these assumptions are increasingly subject to challenge. Damages are now equally pecuniary and non-pecuniary, so that non-pecuniary damages (such as pain and suffering) are about one half of all damage payments (Tillinghast-Towers Perrin, 2002). For products liability and malpractice, victims and injurers are in a pre-injury contractual relationship. The system is very costly to operate, with estimates of costs and fees of up to 54% of total spending (Tillinghast-Towers Perrin, 2002). Only $.22 of every dollar that goes through the tort system is returned to consumers for compensation for economic damages. Most importantly, many defendants in modern tort suits are actually engaged in reducing, not increasing, accident

[1] If liability is excessive, tort reform might be efficient, but in most cases would still lead to increased risk.

risk; this applies to makers of many products (medicines, protective equipment) and to physicians.[2]

These factors operate together to challenge the very basis of tort law (Calfee and Rubin, 1992). Because injurers and victims are in a contractual relationship, victims will pay for potential damage payments ex ante in the form of higher prices. The ex ante payments must cover not only pecuniary damages, but also non-pecuniary damages (which are damages for events that do not raise the marginal utility of wealth and which do not create a demand for insurance) and administrative costs. As prices increase, consumers become less willing to pay for the goods and services covered by tort law. Suppliers may decide to stop supplying the goods and services altogether. And because many of these goods and services would reduce accident risk, increasing tort liability may actually lead to increased, not reduced, accident risk. Similarly, tort reforms that decrease tort liability and make risk-reducing products more available and affordable may reduce accident risk.

There are numerous real-world anecdotal examples of higher prices and lower supply of risk-reducing products forcing consumers to substitute to more dangerous products. For example, shortages of OB/GYN doctors in states with high liability costs result in less pre-natal care. Increasing prices for safer automobiles force some consumers to buy more dangerous motorcycles or drive older cars with fewer safety features. High prices for the safest child car seats force many consumers to buy less-expensive and less-safe car seats. Increasing medicine prices mean that some poorly-

[2] For example, the American Trial Lawyers (ATLA) website lists "litigation groups," "voluntary associations of ATLA members sharing an interest in a particular type of case." As of April 18, 2005, there were 73 such groups; of these, 30 were directly related to health providers, including categories such as "birth trauma," "health care disability," "medical negligence," and "pharmacy liability." Thus, 40% of the

insured consumers cannot afford to take medicine regularly. (For some evidence on this issue, see Manning, 1994). Because liability costs are at least partially responsible for the high prices, our tort system may be responsible for increasing accident risk.

Many aspects of the tort system and tort reform have been studied in detail. It is common to use state data to examine various effects of tort reform on variables of interest. CBO (2004) provides a useful summary of this research. The general findings are that tort reform reduces the number of lawsuits and amount of damages, and has improved the profitability of insurance companies. Although no studies have examined the impact of tort reform on accidents, it is generally agreed by most economists that "…if the liability system has a real purpose today, it must lie in the creation of incentives to reduce risk" (Shavell, 2004, at 268). If it does not reduce risk, then there is a real question about the social purpose of the modern American tort system.

Thus, to evaluate the merits of the tort system and decide on the benefits of tort reform it is necessary to examine the impact of tort reform on accidents. This is what we do in this paper. Section II explores the theoretical relationship between tort reform and accidents. Section III tests the relationship by investigating the association between tort reform and accidental death rates. Section IV discusses implications and concludes.

II. The Link Between Tort Reform and Accidents

In this section, we explore the theoretical relationship between tort reform and accidents. We begin with a general discussion of the opposing effects of liability

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litigation groups represent health related providers; the share of health spending in the economy is about 15%.

reduction on accidents. Then, we describe how some specific reforms should affect accidents.

A. Liability Reduction and Accidents

Although a few states have had reforms in place for several decades, the enactment of tort reforms increased dramatically in the mid-1980s in response to rising insurance costs (CBO, vii).[3] Since 1986, states have enacted various combinations of tort reforms. Most state tort reforms are based on the premise that too many tort claims are filed and damage awards are too high. As a result, almost all reforms try to limit the number of cases filed or the damages awarded.

This reduction in expected liability may have two opposing effects on accidents. First, it may increase accidents as tortfeasors internalize less of the cost of externalities, and thus, have less incentive to reduce the risk of accidents. Second, it may decrease accidents as lower liability costs result in lower prices and supply increases, enabling consumers to buy more risk-reducing products and services.

To explain the second effect, consider the following model. Assume that a product reduces the risk of a certain kind of accident. The accident has expected pecuniary losses of L_p and expected nonpecuniary losses of L_{np}. Assume the background risk of the accident is p_b and the modified risk of the accident when using the safety product is p_m. A consumer's valuation of the safety product, and hence, the amount they are willing to pay for the product, V_c, is the marginal reduction in the probability of an accident multiplied by the total expected loss from the accident:

$$(1) \qquad V_c = (p_b - p_m) * (L_p + L_{np}).$$

Assume that c is the cost of producing the safety product, and if a consumer has an accident when using the safety product, the probability that the manufacturer will be held liable for the losses is p_l. The manufacturer is willing to sell the product for an amount V_p that is no less than the cost of production plus the expected liability cost:

$$(2) \qquad V_p = c + (p_m)*(p_l)*(L_p + L_{np}).$$

An informed consumer will be willing to purchase the product if $V_c \geq V_p$.

Applying real numbers to the example, assume that the background risk of an accident, p_b, is 0.00015 and the reduced risk of the accident when using the safety product, p_m, is 0.0001 (a one-third reduction in risk). If an accident occurs, the expected pecuniary loss from the accident, L_p, is \$500,000 and the expected nonpecuniary loss from the accident, L_{np}, is \$3,000,000. The cost of producing the product is \$20. Assume finally that, if a consumer has an accident when using the safety product, there is a 60% chance that the manufacturer will be liable for all losses.

The informed consumer is willing to pay up to

$$V_c = (.00015 - .0001) * (\$500{,}000 + \$3{,}500{,}000) = \$175.$$

The informed producer is willing to sell the safety product for no less than:

$$V_p = 20 + (.0001)*(.6)* (\$500{,}000 + \$3{,}500{,}000) = \$230.$$

Thus, the consumer does not buy the product because $V_c < V_p$. However, if nonpecuniary damages were capped at \$500,000, then the producer would be willing to sell the safety product for no less than

$$V_p = 20 + (.0001)*(.6)* (\$500{,}000 + \$500{,}000) = \$80,$$

[3] The reforms were expected to lower insurance premiums by limiting liability exposure. CBO reports that insurance premiums for some commercial policies fell by 40% in 1987, after increasing by 300% from 1984-1986 (CBO, vii).

and the transaction should occur because $V_c > V_p$. As more consumers choose to purchase the cheaper safety product, accidents may decrease.

Several empirical studies provide evidence that tort reforms that lower liability costs decrease the prices for goods and services. Some studies have found that several different types of tort reforms have lowered liability costs by decreasing both lawsuits filed and damages awarded (Browne and Puelz, 1999; Yoon, 2001).

Other studies have established that lower liability costs result in lower prices. For example, Manning finds that that reductions in liability costs result in lower prices for both vaccines and prescription drugs (Manning, 1994; Manning, 1997). Other studies find that tort reforms that reduce liability costs lower both medical malpractice premiums and general liability premiums (Viscusi, et. al., 1993; Born and Viscusi, 1994; Born and Viscusi, 1998; Thorpe, 2004; Viscusi and Born, 2005). When suppliers pay lower premiums, they can pass along some of the savings to consumers by lowering the prices of goods and services.[4]

Similarly, when high liability costs increase medical malpractice premiums, doctors pass along the costs by increasing prices. Consumers may be unable to afford the more expensive medical services, and medical insurance companies may not cover the services. As a result, some doctors may decide to leave states with high liability costs. Several empirical studies find this result. Klick and Stratmann (2003) find that tort reforms, in general, lead to increased numbers of physicians in a state. Mello and Kelly (2005) find that many physicians decide not to locate in a jurisdiction (in their case, Pennsylvania) because of high malpractice premiums. They find this effect for many

[4] Consumers of medical services and prescription drugs may experience the price decreases indirectly, through lower premiums for their own health or prescription drug insurance.

classes of physicians, including those in emergency medicine. They also find those physicians not leaving the state are less likely to practice high-risk specialties, including trauma care. Kessler et al. (2005) find an increase in the number of physicians in states that have adopted tort reform. In the specific case of emergency physicians, they find that "direct reforms led to increased growth in the supply of emergency medicine physicians of approximately 11.5%, almost 3 times the magnitude of the average nongroup effect of 3.9%." These findings may be particularly relevant for our analysis of accidental deaths, for a lack of emergency physicians will cause more accidents to lead to death.

B. Specific Tort Reforms

In the empirical section of our paper, we examine the relationship between accidental death rates and several different tort reforms: caps on noneconomic damages, caps on punitive damages, a higher evidence requirement for punitive damages, product liability reform, reforms to the prejudgment interest rule, reforms that allow courts to offset awards by the amount of collateral source payments, reforms that permit the admissibility of evidence of collateral source payments, or reforms to joint and several liability rules. We now describe each tort reform and the predicted effects of the reforms on death rates.

Noneconomic damages are damages for nonpecuniary losses such as pain and suffering, loss of consortium, emotional distress, and other intangible losses. Nonpecuniary losses are real losses. However, in general they do not increase the marginal utility of wealth, and so consumers do not generally purchase insurance against this class of losses. Moreover, this class of damages involves no direct economic loss and has no precise value. Because of the intangibility of the losses and the lack of

guidance from the courts on the value of the losses, jury awards for noneconomic damages are highly erratic. Proponents of tort reform claim that noneconomic damage caps would make the damages more predictable and reduce the excessiveness of the awards, promoting both more efficient deterrence and ease of settlement.

Punitive damages are awarded not to compensate plaintiffs, but to punish defendants for intentional and malicious conduct and to deter future conduct. Punitive awards are infrequent, but have increased in frequency and size in recent years. Similar to caps on noneconomic damages, tort reform proponents claim that caps are needed to make punitive damages more predictable and less excessive. Again, this should improve the settlement process and achieve more efficient deterrence. In most states, reforms to punitive damages have taken one of two forms: caps on punitive damages or higher evidence requirements before punitive damages are awarded. (The U.S. Supreme Court has also limited punitive damages, finding that in most cases a "single digit multiplier" is appropriate, so that punitive damages cannot be larger than 9 times actual damages.[5])

Product liability law is intended to compensate consumers injured by defective products and deter manufactures from selling such products. Supporters of tort reform claim that many product liability laws do not send clear signals to manufacturers about how to avoid liability and hold manufacturers liable for defects that it was impossible for them to anticipate (ATRA, 41). They claim that manufacturers pass along liability risk to consumers in the form of higher prices, and often, manufacturers choose to quit producing certain products altogether to avoid liability. Product liability reform is meant to alleviate these problems by imposing certain limits on manufacturers' liability and

[5] U. S. Supreme Court, State Farm Mutual Automobile Insurance Co. *V.* Campbell Et Al., Certiorari To The Supreme Court Of Utah, No. 01–1289. Argued December 11, 2002—Decided April 7, 2003

eliminating absolute liability, replacing it with a rule requiring a product defect in order for a plaintiff to collect.

Prejudgment interest is interest that accrues on losses from the time of a tort to the time damages are paid. This interest is an actual cost to victims because if there had been no tort, then the victim could have earned interest. For example, a victim that covers his own medical costs until the injurer compensates him could have earned interest on the money. In addition, allowing prejudgment interest may encourage early settlements and reduce delay in the disposition of cases. However, tort reform proponents claim that allowing prejudgment interest can result in over-compensation and punish defendants for delays they may not have caused. Also, recall that economic damages make up only 22% of total tort damages. Thus, most reforms limit the interest rate and include offers of judgment provision.

Collateral source rules prevent evidence to be admitted at trial that shows that a plaintiff's losses have been compensated by other sources, such as insurance or workers' compensation. Such rules promote efficient deterrence by requiring tortfeasors to pay damages even when victims have received payments from a collateral source. However, proponents of tort reform claim that collateral source rules promote double recovery and result in higher insurance premiums. Reforms to collateral source rules include allowing evidence of collateral source payments or completely offsetting awards by the amount of collateral source payments. The result is that injured parties will collect from their own insurance companies but injurers may not pay anything.

Joint and several liability means that any party who was involved in causing a tort may be responsible for the entire cost of the tort, no matter how small the contribution

may be. Essentially, this allows plaintiffs to collect from "deep pockets" even if they were only marginal contributors. Although the standard rule protects the rights of plaintiffs to be fully compensated, it often fails to equitably distribute liability among defendants. It may also create an incentive for some defendants to settle to avoid becoming liable for the entire loss, leaving others, who may be almost entirely blameless, liable for large damages. Most reforms to the standard joint and several liability rules involve some sort of proportionate liability reform that limits exposure for those who played only a small part in causing the tort.

These tort reforms have the two opposing effects on accidents discussed in the previous subsection. That is, the reduction in liability should increase accident risk as potential tortfeasors internalize fewer costs. On the other hand, the reforms may decrease accident risk if they result in increased supply and lower cost of risk-reducing products or services, including medical care. Only empirical analysis will determine which effect dominates for each reform.[6]

[6] In most tort cases, the accident occurs in the state where both the plaintiff and defendant reside. In these cases, courts apply the laws and remedies of that state. In contrast to other accident cases, product liability cases often involve resident of different states; in such cases, courts differ on which states' law to apply. Some states use the law of the state where the accident occurred, the lex loci delicti rule (in 1990, 14 states used the lex loci delicti rule; in 2003, only 8 used this rule) (see Scoles, Hay, Borchers, and Symeonides, 2004). Other states use more flexible rules and consider which state has the most significant contacts with the parties, and the content of the substantive laws of the contact states. In product liability cases, the relevant contacts are the plaintiff's state of residence, the state where the injury occurred, the state where the product was purchased, the state where the product was manufactured, and the principal place of business for the defendant. However, even in multistate products-liability cases, most cases (76%) applied

III. Empirical Evidence of the Relationship Between Tort Reform and Accidental Death Rates

Next, we test the theoretical relationship between tort reform and death rates discussed in Section III. Figure I presents the average accidental, non-motor vehicle, death rates for the United States from 1980 to present.[7] We do not include motor vehicle death rates for several reasons. These death rates are about one-half of all accidental deaths (National Safety Council, 2004). But they are affected by many statutory changes in addition to tort reform, such as no-fault insurance laws (Cohen and Dehejia, 2004) and changes in speed limits. Moreover, most tort reforms would have only indirect influence on motor vehicle tort law. Nonetheless, we see in Table VII that their inclusion does not have major implications for our results.

First, we compare state death rates before and after tort reform and compare death rates in tort-reform states to death rates in non-tort-reform states. Then, we use panel data regressions to more systematically examine the relationship between tort reform and death rates. We also examine the sensitivity of our regression results to alternative specifications.

A. Comparing Death Rates Before-and-After Tort Reform

Table I displays a comparison of death rate trends in the years before and after the enactment of certain tort reforms, as well as the number of instances each tort reform was enacted.[8] Although this analysis controls for no other factors affecting death rates, it is still

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the law of a state with plaintiff-affiliating contacts, and only 4% of the cases involved actual forum shopping, and 4% involved borderline forum shopping (Symeonides, 2004).

[7] From 1981-2002, the non-motor vehicle accidental deaths are 22% falls, 17% poisonings, 12% unspecified, 10% drowning, 10% suffocation, 9% fires, and 6% adverse effects to medical care or drugs. (Center for Disease Control, WISQARS Leading Causes of Death Reports, 1981-2002).

[8] The tort reforms presented in Table I are the reforms found to have a statistically significant relationship with death rates in Table II. Because some states enacted the same tort reform more than once (i.e. the

quite informative. Many factors that affect death rates change only slightly over a short period of time. Therefore, quick changes in a state's death rate following the enactment of a tort reform suggest a relationship between these variables. Also, tort reforms were enacted in different years in different states. Observing similar changes in death rates immediately after the same tort reform in different years and in various states provides compelling evidence of the reforms' effect on death rates.

The second column in Table I is the median percentage change in accidental, non-motor vehicle death rates from two years to one year before each tort reform is enacted. This column reveals the trend in death rates before each tort reform. The third column is the percentage change in accidental, non-motor vehicle death rates from the year before to the year after each tort reform is enacted. This column reveals the change in death rates when each tort reform was enacted. Death rates decreased in the years that five of the seven tort reforms were enacted: caps on noneconomic damages, caps on punitive damages, a higher evidence standard for punitive damages, allowing evidence of collateral source payments, and prejudgment interest reform.[9] In fact, death rates were increasing in the years prior to the enactment of caps on noneconomic damages, caps on punitive damages, and reforms that allow the admission of evidence of collateral source payments, but began decreasing the year these reforms were enacted.

The results for reforms to product liability and collateral source reforms that offset awards are different; death rates increased in the years after these two reforms were enacted.

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second reform was enacted after the first was found unconstitutional), there may be more reforms enacted than states with each reform.

[9] The conclusions are the same if the mean percentage change is used, instead of the median percentage change.

Although Table I presents the death rate changes in tort-reform states before and after the enactment of each tort reform, it does not show how the changes compare to non-tort-reform states. Table II presents the difference in the death rate changes between tort-reform and non-tort-reform states. That is, Table I reveals that death rates decreased in the 15 states that enacted caps on noneconomic damages, and Table II reveals how the death rate changes in each of these 15 states compared to the average death rate change in the other states.

Specifically, we calculated the average percentage change in death rates in each year, and then compared the change in death rates in each tort-reform state to this average. We present the comparison in the year before and after each tort reform to see how the tort-reform states compared to the average both before and after tort reforms. Negative numbers in column 2 in Table II indicate that tort reform states had larger-than-average decreases (or smaller-than-average increases) in death rates. Positive numbers indicate that tort reform states had smaller-than-average decreases (or larger-than-average increases) in death rates.

Table II reveals that tort-reform states experienced larger-than-average decreases (or smaller-than-average increases) in accidental, non-motor-vehicle death rates in the years after five of the reforms were enacted: caps on noneconomic damages, caps on punitive damages, a higher evidence standard for punitive damages, allowing evidence of collateral source payments, and prejudgment interest reform. Prior to three tort reforms, caps on noneconomic damages, a higher evidence standard for punitive damages, and allowing evidence of collateral source payments, the tort-reform states had the opposite

relationship with the average; they had experienced smaller-than-average decreases (or larger-than-average increases) in the years before the reforms were enacted.

Once again, the results for reforms to product liability and offsetting awards by the amount of collateral source payments are different; tort-reform states experienced smaller-than-average decreases (or larger-than-average increases) in the years after these two reforms were enacted.

B. Panel-Data Regressions

Although the preceding analysis suggests an impact of some tort reforms on accidental deaths, it controlled for no other factors affecting death rates. To explore the relationship between tort reform and death rates more systematically, we use a state-level, panel data set from 1981-2000.[10] We estimate regressions of the form:

$$(3)\ \ln(DeathRate_{st}) = \alpha + \beta TORTREFORM_{st} + \chi Z_{st} + \delta_s + \phi_t + \varepsilon_{st}$$

where *s* indexes states and *t* indexes time. The left-hand-side variable is the logged accidental, non-motor-vehicle death rate. *Z* is a vector of state-level controls that includes the unemployment rate, real per capita personal income, the percent of the state population that is African-American, the percent of the state population that belongs to another minority racial group, the percent of the state population that is age 4 or under, the percent of the state population that is age 65 or over, the percent of the state population that is male between the ages of 15 and 24, the per capital alcohol consumption, and the number of hospital beds per capita. The variables and sources are described in the Data Appendix, and Table III presents the summary statistics for each variable.

[10] Some of the variables are not available after 2000.

In equation 3, δ_s and ϕ_t represent state and year fixed effects. All regressions are weighted least squares with weights based on state populations.

We estimate the effects of several different tort reform variables. In the first set of regressions, we estimate a separate regression for each tort reform variable. Our measures of tort reform include the amount of the cap on noneconomic damages,[11] and dummy variables for whether a state has a cap on noneconomic damages, a cap on punitive damages,[12] a higher evidence requirement for punitive damages, product liability reform, reforms to the prejudgment interest rule, reforms that allow courts to offset awards by the amount of collateral source payments, reforms that permit the admissibility of evidence of collateral source payments, or reforms to joint and several liability rules. Results of the separate regressions are shown in Table IV. The top row of the table presents the coefficients on the tort reform variables.

The coefficient on the amount of the cap on noneconomic damages is positive and significant. This indicates that a cap with a lower dollar limit, or a more stringent cap, is associated with lower death rates. Similarly, the coefficient on the dummy variable for whether a state has a cap on noneconomic damages is negative and significant, indicating that enacting a cap on noneconomic damages is associated with lower death rates. The coefficients on the four dummy variables for whether a state has a cap on punitive damages, a higher evidence requirement for punitive damages, product liability reform,

[11] For the variable measuring the amount of the cap on noneconomic damages, states with no caps are assigned values equal to one dollar more than the highest cap ($875,001). This variable is meant to represent the maximum amount a potential tortfeasor would expect to pay in damages. Thus, for states with no caps, this variable could actually take on values near infinity. To be more realistic about how much potential tortfeasors expect to pay, and to not bias the results by assigning huge values to no-cap states, we assign values only slightly higher than the cap states. Assigning even larger values does not change the sign or significance of the results.

[12] We do not have a variable measuring the amount of the cap on punitive damages because the state rules vary widely and apply in different situations and with different conditions.

or reforms to the prejudgment interest rule are also negative and significant. This indicates that these tort reforms are also associated with lower death rates.

The coefficients on the two collateral source reform dummy variables are positive and significant. This suggests that modification and abolishment of the collateral source rule are associated with higher death rates. This is an interesting result; Klick and Stratmann (2003) find that collateral source reform leads to higher infant mortality rates. No other reform has consistent results in their paper. Apparently for this variable, the externality increasing effect outweighs the safety increasing effect. Note that other reforms reduce the amount of damage payments for a harmful event, while collateral source reform may lead injurers to paying nothing at all in certain circumstances. Thus, it may not be surprising that this reform has larger injury increasing effects than do others. A more efficient reform might be increased subrogation (in which the injured party's insurance company pays the victim and then collects from the injurer) since this will maintain incentives for internalization.

The coefficient on the dummy variable for reforms to joint and several liability rules is insignificant.

Three of the control variables have significant relationships with accidental death rates. The unemployment rate, the percentage of the population that belongs to a minority group other than African-American, and the per capita number of hospital beds have significant, negative relationships with death rates. The large effect of hospital beds indicates the importance of emergency medical treatment in reducing the death rate from accidents.

It is possible that there is some bias in the separate regressions for each of the tort reform dummy variables. That is, one dummy variable may be picking up the effect of another highly correlated dummy variable. Although most of the dummy variables are only weakly related to each other, a few have stronger correlations: the dummy variables for a cap on noneconomic damages and offsets to awards by the amount of collateral source payments have a 0.47 correlation coefficient, the two collateral source reform dummy variables have a 0.44 correlation coefficient, and the dummy variables for a punitive damages cap and product liability reform have a correlation coefficient of 0.33.

To minimize the bias, we estimate another regression that includes all tort reform dummy variables that had a significant relationship with death rates in Table IV. The weakness of this regression is that there may be multicollinearity between some of the tort reform dummy variables, resulting in insignificant coefficients.

The results of the combined dummy variable regression are shown in Table V. With the exception of the cap on punitive damages, all of the variables maintain the same sign and significance as in the separate regressions. Thus, there is no evidence of any omitted variable bias in most of the separate regressions. The dummy variable for a punitive damages cap may have been significant in the separate regressions because of bias, or it may be insignificant in the combined regression because of multicollinearity.

Nevertheless, the combined dummy variable regression produces more conservative coefficient estimates because it minimizes the possibility of one dummy variable picking up the effect of another dummy variable. Therefore, we use the results of this regression to estimate conservative real-world magnitudes of the tort reforms effects on death rates, summarized in Table VI. A cap on noneconomic damages is

associated with, on average, a 3.9 percent decrease in the accidental, non-motor vehicle annual death rate, a higher evidence standard for punitive damages is associated with a 2.5 percent decrease, product liability reform is associated with a 3.2 percent decrease, and prejudgment interest reform is associated with a 4.8 percent decrease in the annual death rate. Computed over all states and years that had each reform, the coefficients suggest that caps on noneconomic damages have saved 5,349 lives, higher evidence standards for punitive damages have saved 10,331 lives, product liability reforms have saved 12,026 lives, and prejudgment interest reform has saved 7,471 lives.

However, some tort reforms are associated with increases in death rates. Reforms that allow courts to offset awards by the amount of collateral source payments are associated with a 5.5 percent increase in the accidental, non-motor vehicle annual death rate, and reforms that permit the admissibility of evidence of collateral source payments are associated with a 2.5 percent increase. Computed over all states and years that had each reform, the coefficients suggest that offsetting awards by collateral source payments has led to 16,486 more deaths and allowing evidence of collateral source payments has led to 4,469 more deaths. The net effect of all tort reforms is a saving of 14,222 lives.

The unemployment rate, the percentage of the population that belongs to a minority group other than African-American, and the per capita number of hospital beds maintain their significant, negative relationships with death rates. The per capita alcohol consumption now has a significant, positive relationship with death rates.

C. Sensitivity Analysis

Table VII examines the sensitivity of the tort reform coefficients to a range of alternative specifications. Each row of the table represents a different specification, and

two variations are presented for each specification. The first variation, labeled Model a, reports the coefficient estimates from separate regressions for each tort reform variable and is similar to the results from Table IV. The second variation, labeled Model b, reports the coefficient estimate from the regression that includes all tort reform dummy variables and is similar to the results from Table V.

The first specification tests whether the results are robust to the elimination of states with high death rates by excluding Alaska from the estimation of equation (3). Alaska has the highest accidental death rate of all states; the mean death rate in Alaska is over 7 standard deviations above the population-weighted mean death rate of all states. Again, the coefficients are identical in sign and significance to the primary results, and only slightly different in magnitude.

It is very unlikely that reverse causation is driving our primary results.[13] That is, it is unlikely that decreasing death rates causes tort reform. Several papers have concluded that the primary drivers of tort expansion and tort reform are the relative power of lawyers and businesses in a state. (This literature is summarized in Rubin, in press). None of the papers have concluded that death rates are important factor. If anything, increasing death rates should lead to more tort reform: increases in death rates increase tort claims which should motivate potential tortfeasors to fight for tort reform to lower liability damage payments. However, this relationship would cause a bias in the opposite direction of our results: we should find a positive relationship between tort reform and death rates, not a negative one.

Nevertheless, in the second specification, we investigate the robustness of our results to the possible endogeneity of the tort reform variables. In our IV estimation, we

use the following variables as instruments for the enactment of each tort reform: the percentage of the state population voting Republican in each presidential election and the per capita number of people employed in the legal profession.[14] The coefficients maintain their sign and significance, except for the dummy variable representing caps on noneconomic damages that becomes insignificant. Moreover, the coefficients increase substantially in magnitude, suggesting that any endogeneity produces a bias in the opposite direction of our primary results.

The third specification tests the robustness of our results to the type of accidental deaths used as the dependent variable. Our primary regressions estimated the relationship between tort reforms and accidental, non-motor vehicle deaths because motor vehicle deaths are strongly affected by different factors that we do not control for. Nevertheless, including motor-vehicle deaths in the death rate produces very similar results. All tort reform variables maintain their sign and significance except for the amount of the cap on noneconomic damages, a higher evidence standard for punitive damages, and the dummy variable indicating the admissibility of evidence of collateral source payments in the separate regressions. Even the insignificant reform variables maintain the same sign as in the primary regressions.

We perform a range of other sensitivity tests. The fourth specification in Table VII presents the results of the tort reform variables with Newey-West standard errors, where the error structure is assumed to be heteroskedastic and possibly autocorrelated up

[13] Endogeneity tests confirm that OLS is a consistent estimator for equation (3) for all tort reforms.
[14] For the endogeneity specification, we estimate only the variation with separate regressions for each tort reform variable (model a). The instruments perform extremely well in the first-stage regressions. The F-statistics average over 16.0, and the instruments are positive and significant for most of the tort reform variables.

to lag(2).[15] Although the standard errors increase slightly, all tort reform variables maintain their sign and significance except for the dummy variable indicating the admissibility of evidence of collateral source payments in the separate regressions. Next, we estimate equation (3) with the death rate as the dependent variable, instead of the log of the death rate; the coefficients are identical in sign and significance to the primary results. When we include state-specific trends in the sixth specification, the coefficients on three tort reform variables lose their significance in the separate regressions: a higher evidence requirement for punitive damages, product liability reform, and reforms that permit the admissibility of evidence of collateral source payments.

Specification seven excludes all controls except for state and year fixed-effects. Except for the variable measuring the amount of the noneconomic damage cap and the dummy variable representing this cap, all other coefficients maintain their sign and significance. Lastly, when we perform unweighted panel data regressions, as opposed to population weighted, the coefficients for five of the tort reforms are identical in sign and significance.

IV. Conclusion

The U.S. tort system is a more significant economic factor than the tort system of any other country. It is estimated that the U.S. tort system costs about 2.3% of GDP; for no other country was the amount more than 1.3% of GDP (Italy) and the average for all OECD countries was .9% (Rubin, 1995, using data from Tillinghast-Towers Perrin). It is an extremely expensive system, and can be justified only if it provides substantial

[15] The lag is estimated by 0.75*T^(1/3) where T is the number of periods (Stock and Watson, 2002).

deterrence.[16] Our paper suggests that not only does the tort system not deter deaths, it may actually increase the number of accidental deaths. Although classic law and economics predicts that a reduction in tort liability will increase accidents as potential tortfeasors internalize fewer costs, our empirical evidence suggests the opposite. Tort reforms reduce tort liability by decreasing the number of lawsuits and damage awards. This allows potential tortfeasors to lower ex ante prices to consumers. If the cheaper goods and services are designed to reduce risk, then tort reform may decrease accidents as consumers buy more protective products.

Several tort reforms—caps on noneconomic damages, caps on punitive damages, a higher evidence standard for punitive damages, product liability reform, and prejudgment interest reform—are associated with decreases in accidental death rates. In contrast, reform of the collateral source rule is associated with increases in accidental death rates. Net, we estimate that the series of tort reforms adopted in the states between 1981 and 2000 have saved a total of 14,222 lives. The results are robust to several alternative specifications.

Our results suggest that certain reforms are needed to make the current tort system more effective. Proponents of tort reform should concentrate on caps on noneconomic damages, caps on punitive damages, a higher evidence standard for punitive damages, product liability reform, and prejudgment interest reform. There should be less attention paid to collateral source reform, although improvements in the subrogation process may be able to eliminate double compensation and preserve incentives for safety.

[16] "Thus, the use of the liability system will be socially worthwhile if and only if the savings from accident reduction it brings about exceed its administrative costs." Shavell, 2004, at 284.

Data Appendix

Death Rate Data
Accidental, non-motor vehicle death rates and motor vehicle death rates are from the Centers for Disease Control and Prevention, National Centers for Injury Prevention and Control. Web-based Injury Statistics Query and Reporting System (WISQARS). Available from: www.cdc.gov/ncipc/wisqars

Tort Reform Variables
All data on state tort reforms and amounts of damage caps are from the American Tort Reform Association. Most data are compiled in the Tort Reform Record (July, 2005) available at: http://www.atra.org/files.cgi/7927_Record7-05.pdf. Additional data are available from the ATRA Issues section of the website, available at: http://www.atra.org/display/19.

Unemployment Rate
Unemployment rate series were collected from the Bureau of Labor Statistics, Local Area Unemployment Statistics: http://www.bls.gov/lau/home.htm.

Income
Per capita income data were obtained from the Bureau of Economic Analysis at http://www.bea.gov/bea/regional/spi/. The nominal data were changed into real using consumer price index series (with 1983/1984 as the base year) obtained from the Bureau of Labor Statistics, http://data.bls.gov/cgi-bin/surveymost?cu.

Demographic Variables
Age, gender, race, and population data were compiled from the U.S. Census Bureau's Population Division, available at: http://www.census.gov/popest/states/.

Per Capita Alcohol Consumption
This variable is the per capita ethanol consumption from beer, wine, and spirits for each state. It is obtained from the National Institute of Health, National Institute on Alcohol Abuse and Alcoholism, available at: http://www.niaaa.nih.gov/databases/consum03.htm.

Hospital Beds per Capita
This variable is the per capita number of beds in the hospitals that are AHA members (excludes nursing homes). It is compiled from the American Hospital Association's, Hospital Statistics annual publications

Legal Services per Capita
This variable is the per capita number of employees engaged in legal services. Legal services include all for-profit and nonprofit establishments which are headed by members of the bar and are engaged in offering legal advice or legal Services. The data is available from the U.S. Census Bureau at: http://censtats.census.gov/

Voting Data

The data on voting in presidential elections is from The Atlas of U.S. Presidential Elections by Dave Leip. The data is available online at: http://www.uselectionatlas.org/.

References:

National Safety Council (2004), *Injury Facts*, available online.

Brown, J. P. (1973) "Toward an Economic Theory of Liability" 2 *J. of Legal Studies* 323-349 (June.)

Born, Patricia H. and Kip Viscusi (1998), "The Distribution of the Insurance Market Effects of Tort Liability Reforms," *Brookings Papers on Economic Activity: Microeconomics*, 55-100.

Born, Patricia H. and Kip Viscusi (1994), "Insurance Market Responses to the 1980s Liability Reforms: An Analysis of Firm-Level Data," *Journal of Risk and Insurance* v. 61, no. 2, 192-218.

Browne, Mark J. and Robert Puelz, (1999) "The effect of Legal Rules on the Value of Economic and Non-Economic Damages and the Decision to File," *Journal of Risk and Uncertainty*, V. 18, No. 2 (August), 189-213.

Calfee, John E. and Paul H. Rubin (1992) "Some Implications of Damage Payments for Nonpecuniary Losses," 21 *Journal of Legal Studies*, 371-411.

Cohen, Alma and Rajeev Dehejia (2004), "The Effect of Automobile Insurance and Accident Liability Laws on Traffic Fatalities," *Journal of Law and Economics*, V. 67, No. 2, October, 357-394.

Congressional Budget Office (2004), "The Effects of Tort Reform: Evidence from the States," June.

Kessler, Daniel P., William M. Sage and David Becker (2005), "Impact of Malpractice Reforms on the Supply of Physician Services," *JAMA*, Volume 293(21) 1 June, p. 2618–2625

Klick, Jonathan and Thomas Stratmann (2003), "Does Medical Malpractice Reform Help States Retain Physicians and Does It Matter," available form SSRN.

Landes, William, and Richard Posner (1987) *The Economic Structure of Tort Law*, Harvard University Press, Cambridge, Mass.

Manning, Richard L. (1994) "Changing Rules in Tort Law and the Market for Childhood Vaccines," *Journal of Law and Economics*, Vol. 37, No. 1 (April), pp. 247-275

Manning, Richard L. (1997) "Products Liability and Prescription Drug Prices in Canada and the United States," *Journal of Law and Economics*, Vol. 40, No. 1 (April), pp. 203-43.

Mello, Michelle and Carly Kelly (2005), "Effects of a Professional Liability Crisis on Residents' Practice Decisions," *Obstetrics & Gynecology*, V. 106, No. 6, June, 1287-1295.

Rubin, Paul H. (1995), "Fundamental Reform of Tort Law," *Regulation*, No. 4, 26-33.

Rubin, Paul H. (in press), "Public Choice and Tort Reform," *Public Choice*.

Shavell, Steven (1987) *The Economics of Accident Law*, Harvard University Press, Cambridge, Mass.

Shavell, Steven (2004), *Foundations of Economic Analysis of Law*, Cambridge: Harvard University Press.

Stock, James H. and Mark W. Watson (2002), *Introduction to Econometrics*, Boston, MA: Addison Wesley.

Thorpe, Kenneth E. (2004), "The Medical Malpractice 'Crisis': Recent Trends and the Impact of State Reforms," *Health Affairs (*http://content.healthaffairs.org/cgi/reprint/hlthaff/w4.20v1.pdf)

Tillinghast-Towers Perrin (2002), "U.S. Tort Costs: 2002 Update."

Viscusi, Kip W. and Patricia H. Born. (2005), "Damage Caps, Insurability, and the Performance of Medical Malpractice Insurance," *Journal of Risk and Insurance* V. 72, No. 1, 23-43.

Viscusi, Kip W., et. al. (1993), "The Effect of the 1980s Tort Reform Legislation on General Liability and Medical Malpractice Insurance," *Journal of Risk and Insurance* V. 6, 165-186.

Yoon, Albert, (2001), "Damage Caps and Civil Litigation: An Empirical Study of Medical Malpractice Litigation in the South," *American Law and Economics Review* v. 3, no. 2, 199-227.

Table I
Trends in Death Rates Before and After Tort Reforms

Tort reform	Median Annual Percentage Change in Accidental, Non-Motor Vehicle, Death Rates		Number of times tort reform enacted
	Percentage Change in the Year before tort reform	Percentage Change in the Year after tort reform	
cap on noneconomic damages	3.37	-4.72	15
cap on punitive damages	1.07	-1.94	20
higher evidence standard for punitive damages	-0.08	-0.5	32
caps in product liability cases	-.94	1.17	25
collateral source reform: offset awards	0.82	1.31	18
collateral source reform: admit evidence	2.17	-2.85	17
Prejudgment interest reform	-0.4	-4.7	14

Table II
Differences in Death Rates Among Tort-Reform and Non-Tort-Reform States

Tort reform	Median Difference in the Percentage Change in Accidental, Non-Motor Vehicle, Death Rates between Tort-Reform and Non-Tort-Reform States		Number of times tort reform enacted
	Difference in the Year before tort reform	Difference in the Year after tort reform	
cap on noneconomic damages	1.76	-2.56	15
cap on punitive damages	-0.2	-2.47	20
higher evidence standard for punitive damages	0.29	-0.36	32
caps in product liability cases	-0.03	0.31	25
collateral source reform: offset awards	-0.27	2.90	18
collateral source reform: admit evidence	0.57	-2.39	17
Prejudgment interest reform	-0.86	-2.24	14

Table III
Summary Statistics

Variable	Mean	Standard Deviation (overall)	Standard Deviation (within state)
accidental, non-motor vehicle death rate	19.48	3.31	2.0
amount of cap on noneconomic damages	833,257.9	134,350.1	42,392.67
unemployment rate	6.32	2.10	1.72
real per capita personal income	12,154.45	1924.38	1342.17
percent African-American	12.35	8.03	0.54
percent other minority	3.92	5.24	1.10
percent age 4 and under	7.39	0.78	0.39
percent age 65 and over	11.49	1.94	0.64
percent male age 15 - 24	7.73	0.89	0.77
per capital alcohol consumption	2.38	0.45	0.25
hospital beds per capita	0.003	0.0008	0.0006
legal services per capita	0.003	0.002	0.0005
vote	47.82	9.71	8.41

Notes: The values reported in the table are means of annual, state-level observations for the period 1981-2000. The values are population weighted averages. All summary statistics are based on 1020 observations. See Data Appendix for further details.

Table IV

Estimates of the Relationship between Tort Reform and Death Rates: Separate Regressions for Each Tort Reform Variable

	Coefficient on Each Variable when the Tort Reform Variable is								
Variable	amount of cap on non-economic damages	cap on non-economic damages	cap on punitive damages	higher evidence standard for punitive damages	caps in product liability cases	Prejudg-ment interest reform	collateral source reform: offset awards	collateral source reform: admit evidence	joint-and-several liability reform
tort reform variable	0.00000006 (.00000003)*	-0.037 (.012)*	-0.033 (.010)*	-0.028 (.009)*	-0.048 (.009)*	-0.050 (.014)*	0.049 (.012)*	0.022 (.012)+	0.012 (.011)
unemployment rate	-0.011 (.003)*	-0.012 (.003)*	-0.008 (.003)*	-0.011 (.003)*	-0.011 (.003)*	-0.010 (.003)*	-0.009 (.003)*	-0.010 (.003)*	-0.010 (.003)*
real per capita personal income	0.00001 (.000006)+	0.000009 (.000007)	0.00001 (.000007)	0.000008 (.000007)	0.000006 (.000007)	0.000006 (.000007)	0.000006 (.000007)	0.00001 (.000007)+	0.00001 (.000007)
percent African-American	0.006 (.006)	0.007 (.006)	0.003 (0.006)	0.003 (0.006)	0.002 (0.006)	0.006 (0.006)	-0.0006 (0.006)	0.006 (0.006)	0.004 (0.006)
percent other minority	-0.031 (.007)*	-0.034 (.007)*	-0.032 (.007)*	-0.026 (.007)*	-0.027 (.007)*	-0.030 (.007)*	-0.026 (.007)*	-0.028 (.007)*	-0.030 (.007)*
percent age 4 and under	0.006 (.010)	0.008 (.010)	0.011 (.010)	0.011 (.010)	0.012 (.010)	0.0008 (.010)	0.006 (.010)	0.009 (.010)	0.008 (.010)
percent age 65 and over	0.012 (.010)	0.007 (.010)	0.012 (.010)	0.011 (.010)	0.009 (.012)	0.010 (.009)	0.008 (.009)	0.010 (.010)	0.010 (.010)
percent male age 15 - 24	0.0002 (.012)	0.0005 (.012)	0.003 (.012)	0.004 (.012)	0.003 (.012)	0.001 (.012)	-0.004 (.012)	0.003 (.012)	-0.001 (.012)
per capital alcohol consumption	0.002 (.030)	-0.010 (.030)	0.015 (.030)	0.025 (.030)	0.024 (.030)	0.012 (.030)	0.036 (.030)	0.011 (.030)	0.013 (.030)
hospital beds per capita	-38.92 (17.05)*	-38.68 (16.84)*	-38.47 (16.81)*	-33.84 (16.70)*	-37.97 (16.58)*	-40.89 (16.83)*	-27.30 (16.66)+	-31.17 (16.75)+	-31.53 (16.77)+
constant	2.84 (.255)*	2.99 (.258)*	2.86 (.254)*	2.84 (.254)*	2.94 (.252)*	2.99 (.256)*	2.96 (.254)*	2.80 (.258)*	2.88 (.255)*
Adjusted R-squared	0.802	0.803	0.804	0.804	0.807	0.804	0.805	0.802	0.802

Notes: Standard errors are in parentheses. "*" and "+" represent significance at the 5% and 10% levels, respectively.

Table V
Estimates of the Relationship between Tort Reform and Death Rates:
Regression Including All Dummy Variables

Variable	Coefficient
cap on noneconomic damages	-0.039 (.013)*
cap on punitive damages	-0.008 (.011)
higher evidence standard for punitive damages	-0.026 (.009)*
caps in product liability cases	-0.032 (.010)*
prejudgment interest reform	-0.048 (.014)*
collateral source reform: offset awards	0.055 (.012)*
collateral source reform: admit evidence	0.025 (.012)*
unemployment rate	-0.008 (.003)*
real per capita personal income	0.000005 (.000007)
percent African-American	-0.002 (.006)
percent other minority	-0.023 (.007)*
percent age 4 and under	0.006 (.010)
percent age 65 and over	0.010 (.009)
percent male age 15 - 24	-.0004 (.012)
per capital alcohol consumption	0.050 (.030)+
hospital beds per capita	-48.12 (16.53)*
Constant	3.16 (.257)*
Adjusted R-squared	0.816

Notes: Standard errors are in parentheses. "*" and "+" represent significance at the 5% and 10% levels, respectively.

Table VI:
Real-World Magnitudes of the Tort Reforms' Effects on Death Rates

Tort Reform	Average Effect on Annual Death Rates:	Total Lives Saved or Lost:
cap on noneconomic damages	-3.9%	-5,349
higher evidence standard for punitive damages	-2.5%	-10,331
product liability reform	-3.2%	-12,026
prejudgment interest reform	-4.8%	-7,471
collateral source reform: offset awards	+5.5%	+16,486
collateral source reform: admit evidence	+2.5%	+4,469
Net Effect:		-14,222

Notes: These computations are based on the coefficients from the combined dummy variable regression (Table V) and the average annual populations and average annual death rates in the states that had each reform.

Table VII
Sensitivity of Tort Reform Coefficients to Alternative Specifications

		Coefficient (Standard Error) on Tort-Reform Variable in Each Specification							
Specification	Model	Amount of cap on non-economic damages	Dummy for cap on non-economic damages	Cap on punitive damages	Higher evidence standard for punitive damages	Product Liability Reform	Prejudg-ment interest reform	Collateral source reform: offset awards	Collateral source reform: admit evidence
Exclude Alaska	a	.00000006 (.00000003)*	-0.035 (.012)*	-0.031 (.011)*	-0.028 (.009)*	-0.049 (.009)*	-0.048 (.014)*	0.051 (.012)*	0.023 (.011)*
	b		-0.037 (.013)*	-0.004 (.011)	-0.025 (.009)*	-0.035 (.010)*	-0.047 (.014)*	0.057 (.012)*	0.026 (.013)*
Endogenous tort reform variables	a	.0000004 (.0000002)+	-0.108 (.110)	-0.100 (.029)*	-0.141 (.038)*	-0.110 (.037)*	-0.390 (.137)*	0.129 (.057)*	0.335 (.087)*
Death Rate Includes Motor Vehicle Deaths	a	.00000002 (.00000002)	-0.028 (.009)*	-0.034 (.007)*	-0.0002 (.006)	-0.038 (.007)*	-0.029 (.010)*	0.015 (.008)+	0.014 (.008)
	b		-0.022 (.009)*	-0.018 (.008)*	-0.005 (.007)	-0.028 (.007)*	-0.022 (.010)*	0.021 (.009)*	0.015 (.009)+
Standard Errors Corrected for Heteroskedasticity and Autocorrelation	a	0.00000006 (.00000003)*	-0.037 (.015)*	-0.033 (.016)*	-0.028 (.014)*	-0.048 (.014)*	-0.050 (.019)*	0.049 (.020)*	0.022 (.015)
	b		-0.039 (.014)*	-0.008 (.016)	-0.026 (.013)*	-0.032 (.014)*	-0.048 (.017)*	0.055 (.019)*	0.025 (.014)+

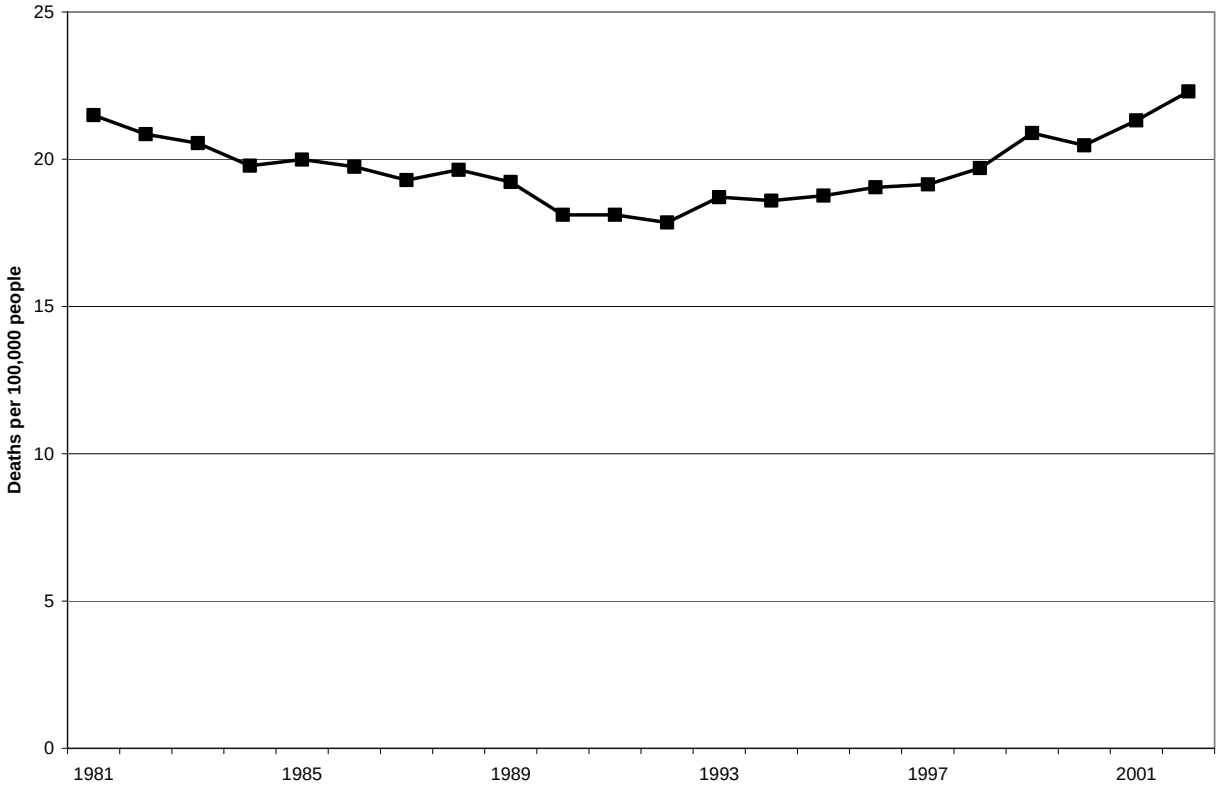
Notes: Results in this table are variations on the specifications reported in Table IV (designated model *a* which has separate regressions for each tort reform variable), or Table V (designated model *b* which has one regression that includes all tort reform dummy variables). Standard errors are in parentheses. "*" and "+" represent significance at the 5% and 10% levels, respectively.

Table VII (continued)
Sensitivity of Tort Reform Coefficients to Alternative Specifications

		Coefficient (Standard Error) on Tort-Reform Variable in Each Specification							
Specification	Model	Amount of cap on non-economic damages	Dummy for cap on non-economic damages	Cap on punitive damages	Higher evidence standard for punitive damages	Product Liability Reform	Prejudg-ment interest reform	Collateral source reform: offset awards	Collateral source reform: admit evidence
Level Specification	a	.000001 (.0000006)*	-0.863 (.256)*	-0.892 (.215)*	-0.611 (.186)*	-1.03 (.193)*	-1.05 (.280)*	0.707 (.247)*	0.373 (.246)
	b		-0.784 (.268)*	-0.354 (.235)	-0.552 (.187)*	-0.613 (.214)*	-1.014 (.288)*	0.831 (.256)*	0.548 (.259)*
Include State Specific Trends	a	.00000006 (.00000003)*	-0.022 (.011)*	-0.017 (.010)+	-0.009 (.008)	-0.007 (.008)	-0.024 (.014)+	0.023 (.012)+	-0.010 (.011)
	b		-0.022 (.012)+	-0.004 (.011)	-0.008 (.008)	-0.004 (.009)	-0.018 (.016)	0.027 (.012)*	-0.012 (.012)
No Control Variables (Except State/Year F.E.)	a	.000000005 (.000000003)	-0.003 (.013)	-0.023 (.011)*	-0.029 (.010)*	-0.052 (.010)*	-0.026 (.014)*	0.074 (.012)*	0.055 (.013)*
	b		-0.020 (.013)	0.0006 (.012)	-0.020 (.010)*	-0.042 (.011)*	-0.026 (.014)+	0.065 (.013)*	0.050 (.014)*
Unweighted	a	.00000003 (.00000003)	-0.019 (.015)	-0.030 (.013)*	-0.030 (.011)*	-0.031 (.012)*	-0.032 (.015)*	0.027 (.013)*	0.018 (.013)
	b		-0.022 (.016)	-0.016 (.014)	-0.030 (.011)*	-0.022 (.012)+	-0.037 (.016)*	0.033 (.015)*	0.020 (.015)

Notes: Results in this table are variations on the specifications reported in Table IV (designated model *a* which has separate regressions for each tort reform variable), or Table V (designated model *b* which has one regression that includes all tort reform dummy variables). Standard errors are in parentheses. "*" and "+" represent significance at the 5% and 10% levels, respectively.

Figure 1:
Accidental, Non-Motor Vehicle Death Rate:
United States, 1981-2002



Source: Center for Disease Control, National Center for Injury Prevention and Control, WISQARS Injury Mortality Reports, 1981-2002.