The Analysis of the Effect of Tort Reform Legislation on Expected Liability Insurance Losses

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Abstract:

This paper presents a framework for possible methodologies to evaluate the effect of tort reform legislation on expected liability insurance losses and loss adjustment expense. An analysis of the most common types of reforms and the difficulties that may be encountered when evaluating their effects is presented. The direct(non-behavioral) effect on General Liability losses of a hypothetical reform which caps punitive damages and non-economic compensatory losses and which eliminates joint and several liability is analyzed using methodologies developed at ISO.

Note:

Due to the highly subjective nature of many tort reforms and their often complex influence on potential litigants' behavior, it is extremely difficult to predict their impact. In the past, many actuaries have taken the view that the best way to approach tort reform is to let the effect of highly subjective reforms be reflected in the loss experience. This is a valid approach since the real impact of the reform will be reflected in the actual experience. ISO has been studying this issue and is in the process of trying to develop a methodology which will permit the reflection of the effect of highly subjective reforms upon losses earlier and with greater precision. In this paper we provide an overview of common types of tort reforms and a discussion of the difficulties encountered when evaluating the impact of these reforms. We also discuss a methodology that is being evaluated at ISO to reflect the direct(non-behavioral) effect on General Liability losses of a hypothetical reform, which caps punitive damages and non-economic compensatory damages and eliminates joint and several liability. These analyses produce only preliminary estimates for only certain types of reforms. We caution against overestimating either the precision of the results presented here or the broadness of their application

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I) BACKGROUND

During the last several years a number of individuals and groups have expressed concern about rising liability insurance costs and about the possibly detrimental effect of high levels of litigation on our national economic efficiency and on the rate of technological innovation in some industries (e.g., pharmaceuticals, aviation). They have proposed statutory changes in the tort system intended to reduce or stabilize litigation expenses, especially for businesses and government agencies. These proposed statutes, which are intended to modify existing statutes and existing case law, have commonly been referred to as tort reforms. Although few such reforms have been enacted at the federal level a number of states have enacted tort reforms. Some reforms have been applicable to certain types of cases, such as, Medical Malpractice and Employer Liability, while others have affected a wide range of cases.

Many of these reforms, to the extent that they are effective, will affect insurance liability losses. The actuarial question of how to prospectively estimate the effect of these reforms on expected losses (including loss adjustment expense) is, therefore, one of increasing importance. For reasons that will be discussed in greater detail below the effect of most reforms can only be estimated by making a number of judgmental modeling assumptions. In some cases data based analyses are not possible at all and polling of attorneys and other experts might produce the best estimates.

Work on this subject performed in several actuarial areas in ISO during the last year has helped form a framework for the analysis of the effect of several different types of reforms. In this paper we will discuss the issues encountered when analyzing tort reforms. We will also provide an example of an analysis of the direct impact of several reforms on General Liability losses.

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II) TYPES OF TORT REFORMS

Most tort reform provisions that have been enacted in the past several years can be characterized as falling in one of the following categories:

1) Limiting the amount of specific type(s) of damages that can be paid to a claimant in total or by a specific tortfeasor. Such as:
   a) Monetary caps on damages or on specific kinds of damages (e.g., punitive damages, non-economic compensatory damages).
   b) Changes to comparative negligence statutes and/or case law.
   c) Changes to joint and several liability statutes and/or case law.

2) Restricting the conditions under which specific type(s) of damages can be paid. Such as:
   a) Changing definitions of types/degrees of negligence.
   b) Changing type/degree of negligence (e.g., gross negligence, intentional acts) required to award specific types of damages (e.g., punitive damages).
   c) Changing contributory negligence statutes and/or case law.
   d) Changing statutes of limitation and/or repose.

3) Modifying the rules of evidence. Such as:
   a) Changing standards of proof.
   b) Changing types of evidence that may be considered in determining fault or evaluating damages (e.g., information on available collateral sources of recovery).

4) Other changes to legal procedures intended to change potential litigants behavior. Such as:
   a) Revised limits on contingency fee percentages
   b) Making the losing side in a civil trial responsible for the legal expenses of the winner
   c) Encouraging or mandating mediation or arbitration

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Of these four major categories of tort reforms limitations on the amount of damages is the area that is most readily analyzed. Statistically reported insurance data can be used to calculate claim size distributions for all indemnity losses combined. For some lines of insurance there is a limited amount of closed claim data that can be used to support assumptions about the distribution of these losses by type of award (economic, general, punitive, etc.), by number of tortfeasors and by degree of contributory negligence. The primary generally available multi-state source that we have found for this type of information is the biennial NAIC Closed Claim Survey for Commercial General Liability. To the extent that additional closed claim data sources are not available for other lines of insurance the effect of tort reforms on these lines must be evaluated indirectly by making judgmental adjustments to the results obtained for General Liability.

Even for lines of insurance where closed claim data is available to evaluate specific reforms, two major conceptual and practical limitations exist. First, in many cases detailed information is only available for claims that go to trial and are resolved by a verdict. This is a small minority of the actual claims that enter the system since most claims are resolved by negotiated settlement at an earlier stage in litigation or after the initial verdict while appeals are pending. Therefore, assumptions about the relationship between the size and composition of awards directed by verdicts and the size and composition of negotiated settlements must be of major importance in any tort reform analysis. Second, any static analysis of this relationship between awards and settlements made under existing conditions must be further adjusted to reflect behavioral changes on the part of claimants, defendants and attorneys resulting from the changes in the risk/benefit scenarios that they face as a result of the reforms. (By risk/benefit scenario we mean the set of possible favorable and unfavorable outcomes faced by each potential participant in the liability claim process and the probability associated with each outcome.)

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III) BEHAVIORAL CHANGES: AN EXAMPLE OF THE LIMITATIONS ON PRECISION OF TORT REFORM ESTIMATES

Even when the direct effects of a reform can be accurately estimated using closed claim and statistically reported data, indirect "behavioral" effects of that reform , which may be of far greater magnitude, may be subject to a far less precise degree of analysis. A very clear example of this situation can be seen in any monetary cap on punitive damages.

As noted above, most cases do not go to trial. Most are resolved by negotiated settlements rather than by verdicts. Punitive damages are only awarded in cases that are resolved by a verdict. We can assume as a working hypothesis that cases that are resolved by settlements have an average implicit provision for punitive damages, that is a specific function of the average punitive damage award that is included in verdicts for similar cases. Of course, the choice of this function may rely largely on informed judgment.

Even if the implicit provision for punitive damages in cases that are resolved by settlements can be accurately estimated under pre-reform conditions, a potentially more significant factor will be even more difficult to estimate. This is the behavioral effect that might result from imposing monetary caps on punitive damages. This effect will be manifest in at least three aspects of the process. The first is the propensity of potential claimants to pursue claims. The second is the propensity of claimants and defendants to go to trial rather than to negotiate. The third is comprised of the possible changes that may occur in the functional relationship between verdict size and composition for cases that go to trial and negotiated settlement amounts for similar cases that do not go to trial.

In short, even when the change in expected losses resulting from a reform can be estimated analytically from data under the assumption that participants' behavior will not change, the actual change in expected losses may be highly dependent on behavioral changes induced by changes in the risk/benefit scenarios faced by the participants. The effects of these behavioral changes may be

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estimable only through an analysis that includes a number of important judgmentally chosen assumptions.

The significance of behavioral changes is often stressed by proponents of specific reforms, including those advocating monetary caps on punitive damages. Defenders of the status quo have pointed out that only a very small number of claims go to trial and that only a minority of those claims result in awards of punitive damages. One argument that opponents of restrictions on punitive damages make is that the overall effect of punitive damages is grossly exaggerated and that punitive damages do not adversely affect economic efficiency but rather serve to deter the most egregious forms of conduct at a relatively small cost to the entire liability system[1]. Proponents of additional limitations on punitive damages respond that the possibility of large punitive damage awards, especially for cases where potential compensatory damages are relatively low, significantly affects the risk/benefit scenarios faced by plaintiffs, defendants and attorneys. They maintain that punitive damages greatly enhance the bargaining position of plaintiffs resulting in a greater propensity by potential claimants to make claims and a greater willingness by defendants to settle claims rather than risk potentially ruinous punitive damages that could result if they insisted on going to trial.[2]

Some proponents of punitive damage caps and other tort reforms claim that these behavioral effects are the truly significant factors that must be considered when evaluating the possible monetary effects of tort reforms. To the extent that this is true, we as actuaries, are faced with the difficulty of having to rely on the least quantifiable and verifiable aspect of our analyses to measure what may be among the quantitatively most significant factors.

[1]   Robin, Topping, "Around the Island Crime & Courts Law and Order   Contract Still Open on Litigation Reform", Newsday , 24 May 1994.

[2]   Steven Hayward, "The Role of Punitive Damages in Civil Litigation: New Evidence from Lawsuit Filings", (San Francisco: Pacific Research Institute for Public Policy),8.

IV) ALLOCATED LOSS ADJUSTMENT EXPENSE(ALAE)

Many reforms may affect expected ALAE in different ways than expected indemnity losses. Both the direct and behavioral effects of each tort reform on expected ALAE must be considered. Consider an example where the major result of an enacted tort reform (e.g., loser pays winner's expenses) is a behavioral change resulting in fewer frivolous claims being made. If most of these claims were formerly successfully contested the effect on expected ALAE may be proportionally much greater than the effect on expected indemnity losses. However, if most of the claims were formerly settled by the defendant to avoid court costs the effect of the reform on ALAE may be proportionally much smaller than the effect on expected indemnity losses. The relationship between indemnity losses and ALAE must be modeled throughout every stage of a thorough tort reform analysis.

V) OUTLINE OF PROCEDURE FOR ANALYZING THE EFFECT OF TORT REFORM LEGISLATION ON EXPECTED LIABILITY LOSSES AND ALAE

The analysis of the effect of tort reforms on liability losses can be divided into the following seven steps.

1) Analyze the content of the tort reform legislation.

2) Evaluate the possible interactions among the various reforms that were concurrently enacted.

3) Evaluate data sources available to aid in the analysis of each reform and develop the best strategy for analyzing each reform as well as for measuring the effect of any interactions found in Step 2.

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4) Perform the analyses designed in Step 3 and test results for reasonableness and consistency. If possible compare with the results of past reforms in the same or different jurisdiction.

5) Evaluate the effect of behavioral changes that may result from changes in the risk/benefit scenarios faced by potential claimants, defendants and attorneys. Modify the analyses performed in Step 4 to reflect this analysis.

6) Evaluate the probability of specific provisions of the reform being overturned or modified under judicial review of the relevant appellate courts. If necessary modify short term pricing decisions to reflect these contingencies.

7) Evaluate any mitigating factors that might temper the effects of the above analysis, such as changes in tactics by plaintiffs' attorneys to circumvent the impact of the reforms.

A discussion of each of these seven steps follows.

STEP 1: ANALYZE THE CONTENT OF THE TORT REFORM LEGISLATION

This is a significant and often a difficult task. The present changes in the statutes have to be analyzed and any earlier changes that might affect prior loss experience used in the tort reform analysis must be identified. A legislative and judicial history extending several years into the past is often needed. It is often necessary to consult with attorneys that are knowledgeable in this area. This may add considerably to the expense of the analysis.

Tracking the changes in the language of all of the relevant statutes may be an arduous and expensive job. However, this is often far easier than interpreting the interactions between the changes in the statutes and case law and judicial practice. In this area local legal experience may be especially valuable. This is a key part of the analysis both retrospectively (in interpreting the

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history of past reforms, as well as the current legal environment in the jurisdiction) and prospectively in evaluating how the statutory provisions of the current reforms will be interpreted by trial and appellate courts. In some cases reform statutes may be, knowingly or not, largely cosmetic in that they may just codify the existing case law.

It is optimal when analyzing significant tort reform legislation to have an effective working relationship between actuaries and attorneys. In-house attorneys who are experts in insurance law may provide a great deal of guidance. Consultation with local attorneys may also be desirable in order to accurately analyze the history of procedures in civil trials in the relevant jurisdiction.

These issues are compounded when multi-state data is used in analyses of tort reform statutes. The relevant aspects of the legal environment in each state whose data is included in the analysis should be evaluated throughout the experience period of the study.

STEP 2: EVALUATE THE POSSIBLE INTERACTIONS AMONG THE VARIOUS REFORMS THAT WERE CONCURRENTLY ENACTED

There are a number of possible different interactions. These should be carefully analyzed by the actuary, where necessary in consultation with an attorney. Comparative negligence provisions are closely related to joint and several liability provisions. Monetary caps on specific types of damages may often interact with other reforms that affect those damages. Numerous other interactions are possible.

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STEP 3: EVALUATE DATA SOURCES AVAILABLE TO AID IN THE ANALYSIS OF EACH REFORM AND PLAN THE BEST STRATEGY FOR ANALYZING EACH REFORM AS WELL AS FOR MEASURING THE EFFECT OF THE INTERACTIONS FOUND IN STEP 2.

As noted in the earlier sections of this paper, data may exist that can be incorporated into the analysis of some reforms, such as monetary caps on damages. However, other reforms may only be subject to a non-data based analysis. Informed assumptions, expert opinions of knowledgeable parties (e.g., local attorneys and claims adjusters) and analogies to reforms with more readily quantifiable effects are among the strategies that may have to be employed for these reforms. Comparison with changes in loss levels in other jurisdictions after similar reforms may be possible. However, in these cases it may be difficult to control for other factors affecting loss levels.

If data from a longer time period than originally expected and or from additional states is included in the analysis then the legal histories produced in Step 1 will have to be extended.

STEP 4: PERFORM THE ANALYSES DESIGNED IN STEP 3 AND TEST THE RESULTS FOR REASONABLENESS AND CONSISTENCY.

Reasonableness can be examined by analyzing the effects of past reforms in the same or different jurisdictions when such information is available. In some cases comparisons may be made with loss levels in states that have legal systems that are similar to the post reform system in the state being studied. Of course, controlling for other factors may be difficult when making historical analogies or making direct comparisons with other jurisdictions. Hopefully, as more reforms are evaluated actuaries will benefit from the experience gained and will be better able to analyze the reasonableness of results.

**STEP 5: EVALUATE THE EFFECT OF BEHAVIORAL CHANGES THAT MAY RESULT
FROM CHANGES IN THE RISK-BENEFIT SCENARIOS FACED BY POTENTIAL
CLAIMANTS, DEFENDANTS AND ATTORNEYS. MODIFY THE ANALYSES
PERFORMED IN STEP 4 TO REFLECT THIS ANALYSIS.**

This is one of the most difficult and important aspects of tort reform analysis. (A discussion of

possible behavioral changes related to monetary caps on punitive damage awards can be found in

Section III of this paper.) Almost any reform can be expected to have some behavioral effect. An

effective reform will change the probabilities of recovery and/or the expense of pursuing a legal

claim for at least some potential claimants. These changes can influence the decisions of

prospective claimants, defendants and attorneys on whether or not to pursue specific claims,

defenses and negotiations. In fact, many proponents of tort reform stress the importance of

behavioral changes. In their opinion the current tort system encourages frivolous litigation which

is detrimental to efficiency and serves as a disincentive to technological innovation. A stated goal

of many proponents of tort reform is to make it more risky and on average less profitable to pursue

frivolous claims and thereby to deter legal action through behavioral change.

**STEP 6: EVALUATE THE PROBABILITY OF SPECIFIC PROVISIONS OF THE REFORM
BEING OVERTURNED OR MODIFIED UNDER JUDICIAL REVIEW OF THE APPELLATE
COURTS. IF NECESSARY MODIFY SHORT TERM PRICING DECISIONS TO REFLECT
THESE CONTINGENCIES.**

Tort reform legislation is often challenged in the courts. Frequently these challenges are at least

partially successful. Even when challenges are not successful, they may significantly delay the full

impact of the reforms. For example, consider the extensive tort reform statute that was enacted in

Illinois during 1995. Illinois courts overturned major provisions of this act in decisions that were issued

in February, May and September of 1996. The February ruling struck a section of the statute that gave

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defendants greater access to the medical records of plaintiffs in many cases [3]. The May ruling found the act's $500,000 cap on pain and suffering awards to be unconstitutional [4]. The September decision struck down provisions dealing with suits concerning unsafe products [5]. The ultimate fate of these and other provisions will probably depend on subsequent decisions by higher appellate courts.

When a reform is passed that seems to have a significant probability of being successfully challenged in the courts a delayed implementation of revisions to insurance prices might be appropriate. Alternatively, a loss cost or premium discount might be adjusted to reflect the likelihood that the tort reform provisions might be rescinded or significantly modified. It may be possible to estimate the probability of various outcomes to court challenges and the percent of the total expected savings that would be associated with each outcome. An average expected saving that reflects the probability of successful challenges could then be calculated and used in place of the full savings estimated under the assumption that the entire reform is upheld. This strategy adds an additional layer of complexity to the analysis. Additionally, it may not be favorably viewed by regulators. In using this strategy a more complex set of assumptions are substituted for the simpler assumption that the provisions of the act will not be significantly modified by judicial action. In either case, the effect of the enacted tort reform should be reevaluated after all significant court challenges are resolved.

STEP 7: EVALUATE ANY MITIGATING FACTORS THAT MIGHT TEMPER THE EFFECTS PREDICTED BY THE ABOVE ANALYSIS, SUCH AS CHANGES IN TACTICS BY PLAINTIFF'S ATTORNEYS TO CIRCUMVENT THE IMPACT OF THE REFORMS.

After enactment of any tort reform provision, plaintiff's attorneys will re-evaluate their legal strategies. In some cases there may be alternate legal strategies that prove effective in at least

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[3]   Andrew Fegelman, "Judge Overturns Tort Reform on Medical Record Access.", The Chicago Tribune, 28 February 1996.

[4]   Andrew Fegelman & Rick Pearson, "State Cap on Jury Awards Removed: Judge Rules Law Unconstitutional.", The Chicago Tribune, 23 May 1996

[5]   Andrew Fegelman, "Another Tort Change Knocked Down: Product Liability Provision Ruled Unconstitutional.", The Chicago Tribune, 18 September 1996

partially mitigating the effect of the enacted reforms. For example, the recent restriction on Federal suits for securities fraud has been followed by an increased number of these cases being brought in the state courts. Changes in the jurisdiction, the legal grounds for a claim, types of damages or the choice of defendants may at times help the claimant to partially or totally avoid the impact of enacted reforms on expected compensation[9].

The rules of the civil justice system are comprised of an intricately entwined mixture of statute and case law, in some cases including principles of common law that go back to colonial times. Even when laws are not successfully challenged in an appellate court the details of their actual implementation may not be completely determined until a number of cases have been tried. It is possible that a court charged with interpreting newly enacted tort reforms will interpret them narrowly in order to preserve rights that existed under former law.

Juries' attitudes may also mitigate the effect of some tort reforms. In cases where there is a great deal of sympathy for the claimant and/or a sense of repugnance at the conduct of the defendant, the jurors' sense of justice may result in decisions that at least partially offset the practical effect of the enacted reforms. For example, limitations on or abolition of punitive damages may cause juries in some cases to award larger amounts in compensatory damages than they would have formerly.

Evaluating these factors is extremely difficult. The legal philosophy of the appellate judges in the state, as well as popular attitudes toward a number of issues can have a decisive effect on how judges and juries shape the post-tort reform system and on the resulting degree of effectiveness of the enacted reforms.

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[9]   Beckett, Paul, "Reform Rings Hollow for Firms Worried About Class Action Law Suits", Wall Street Journal, 4 April 1997

VI) ALTERNATE ANALYTICAL STRATEGIES

We have considered two ways in which to analyze individual tort reform provisions (i.e., in which to perform Steps 3 and 4 of the analysis outlined above). The first such strategy is to use any available data to model the loss generation process before and after the enactment of the reforms and to calculate an effect of the reform as a function of the ratio of the post reform losses to the pre-reform losses. When adequate data for such an analysis does not exist expert opinion, historical analogies and logical arguments are relied upon. Our work to date has centered on developing applications of this strategy to price specific reforms..

An alternative strategy, that we have not yet attempted, would fit a least squares model for loss cost levels to multi-state data where the various states included represent a broad range of legal environments. The fitted values of the regression coefficients for categorical variables identifying different types of civil law procedures could theoretically serve as the basis for estimates of the differences in loss levels that would occur under specific alternative civil law provisions. Other factors that could also influence differences in loss levels among states would also be included in order to remove their effect on state specific loss levels from the analysis. The categorical variables would be evaluated on a state-by-state and year-by-year basis in order to identify differences in levels of factors that occur over time within specific states, as well as among states. The difficulties of performing such an analysis include:

1) Needing to perform an accurate statutory and case law history for each state included in the analysis throughout the experience period used

2) The number of different provisions that could be directly modeled would be restricted by the current and historical variation in provisions among states, although some degree of extrapolation might be valid

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3) The difficulty of identifying and controlling for all major extraneous factors, such as sociological, political and economic differences among states

VII) EFFECT ON INCREASED LIMITS COVERAGE

Many tort reforms impact different size claims differently. This is most obvious for monetary caps, which generally will have a minimal effect on small claims. Larger claims are more likely to involve punitive damages and joint and several liability and are therefore more likely to be affected by reforms in these areas. In many cases the most accurate reflection of changes in expected losses due to tort reforms would be to revise both base loss costs or rates and increased limits tables.

Revising increased limits tables to reflect the effect of tort reforms on expected losses raises several practical and theoretical questions. For credibility reasons increased limits tables are often calculated on a countrywide or multi-state (e.g., all tort states for Personal Auto BI) basis. Revising increased limits tables to reflect individual state tort reforms could result in an explosion in the number of such tables. Individual state increased limits tables may in many cases depend on sparse claim size detail data and require new credibility procedures. The additional cost of computing, updating and applying a significantly increased number of tables must be considered and weighed against the possible increase in accuracy attainable, in light of credibility limitations.

An alternative to individual state increased limits tables is grouping states by tort system. ISO already does this to a limited extent for Personal Auto Bodily Injury Liability by grouping states into a tort state group and five groups of No-Fault states. Refining this system for Personal Auto (breaking up the tort state group) and extending it to other lines is theoretically possible.

Grouping by tort system is certainly preferable to ad-hoc adjustments to countrywide or multi-state tables to reflect tort reforms enacted in individual states. Such ad-hoc adjustments can lead to

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severe inconsistencies. For example. State A might still have a more "plaintiff friendly" tort system even after the enactment of tort reforms than State B does in the absence of any such reforms. If modifications are made to give State A a less steep increased table and State B remains on the countrywide table an obvious inequity would result. In summary, the current countrywide and multi-state increased tables are not pre-reform tables. Instead they are tables that reflect the averages of losses by claim and/or occurrence size incurred under a wide range of legal and other variables among and often within states. Treating these tables as a pre-reform base that can be adjusted incrementally, without tempering, to reflect recently enacted tort reforms can result in significant inaccuracies.

Evaluating increased limits that vary by state group to reflect differences in legal systems among the states is, therefore, an area that deserves further research. Such tables may be more accurate both in a static legal environment and as a way of dealing with tort reforms whose proportional effect differs by loss size. However, the following factors must be considered:

1) Grouping states by legal system for the purpose of calculating increased limits factors requires a thorough state-by-state analysis of each state's tort system including any changes that have occurred during the experience period used for increased limits reviews. Even a thorough review of current and past statutes may not be sufficient due to the importance of case law and judicial procedures in determining the frequency and disposition of claims.

2) Many other factors which may affect loss size distributions significantly differ among (and within) states besides the relevant components of the legal system. Some examples include, types of industry, conditions of roads, level of traffic and safety enforcement, levels of past pollution, income distribution, unemployment levels, political and social attitudes that may be reflected in decisions by juries, judges and other participants in the tort process, etc.

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VIII) EXAMPLE OF THE EVALUATION OF THE EFFECT OF THREE TORT REFORM PROVISIONS ON GENERAL LIABILITY LOSSES

Up to this point we have discussed in considerable detail the difficulties that are faced when evaluating the effect of tort reforms on expected losses. Now we will, more optimistically, present an example of an analysis of the direct (non-behavioral) effect of several of the more readily evaluated reforms on expected General Liability losses.

Given the considerations discussed above we have limited the scope of this analysis in the following ways:

1) We have analyzed only the direct, non-behavioral, effects of the reforms.

2) We have restricted our attention to reforms that are representative of the first category of reforms described in Section I: "Limiting the amount of specific type(s) of damages that can be paid to a claimant in total or by a specific tortfeasor."

3) We have analyzed the effect of the modeled reforms only for premises and operations General Liability(GL) claims.

4) We have restricted our analysis to indemnity losses.

The three reform types that we have analyzed are:

1) Cap on Non-Economic Damage Awards

2) Cap on Punitive Damage Awards

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3) Repeal of Joint & Several Liability.

This analysis produces rough estimates for only certain types of reforms. We caution against over-estimating either the precision of the results, or the broadness of its applicability.

METHODOLOGY

We use simulation to model the effect of these reforms. This allows us more flexibility than a purely analytic method in integrating data from different sources from which the probability distributions of a number of variables are estimated using a variety of discrete and continuous functions.

The ISO occurrence indemnity size distributions provide the framework for our simulation. (Since, a high percentage of these occurrences have a single claimant, we used this occurrence distribution as a proxy for a General Liability premises and operations claim size distribution.) For simplicity, we use the truncated Pareto approximation, rather than the full mixed Pareto model which is used in ISO's General Liability increased limits reviews. Although experience has shown us that the truncated Pareto distribution is a reasonable model for liability occurrence and claim size distributions and that it fits the ISO General Liability occurrence size data well, we recommend evaluating alternate distributions when other data sources are used. We can invert the truncated Pareto, using formulas shown in Exhibit 1. This inverted function is used to generate the sizes of our simulated claims. (A similar analysis can be done if a distribution other than the truncated Pareto is used to model occurrence or claim size.) The ISO data was also used to estimate the percent of total losses that are attributable to bodily injury (BI) rather than property damage (PD) by loss size interval.

For all other information we turned to the 1991, 1993 and 1995 NAIC closed claim surveys. Using them we can make assumptions and estimates about our simulated claims.

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Unfortunately, the NAIC surveys only include sizable bodily injury settlements and verdicts. For property damage, we have no such resource.

As noted above, a fundamental problem is that most GL claims are settled by negotiation and do not result in a verdict. However, a breakdown of damages by type (punitive, non-economic, economic) is only available for the small portion of claims that are resolved by verdict. If a reform caps a portion of an award, we must determine what indirect impact it will have on the settlements. While it seems reasonable that a settlement reflects an expected average verdict for that claim, we know that settlements tend to be smaller than verdicts. Is this a reflection of the possibility of a $0 verdict (which would not get into our average), or is it a different body of claims? Here we assume reforms impact settlements of $X the same as verdicts of $X. We have estimated the following quantities using the NAIC closed claim data:

1) Ratio of average claim size for claims with a punitive damage component to average claim size for all claims.

2) Ratio of average claim size for multiple defendant claims impacted by joint and several liability to average claim size for all multiple defendant claims.

3) Probability of a claim involving multiple defendants.

4) Probability of a multiple defendant claim being impacted by joint and several liability.

5) Probability distribution of non-economic loss amount as a percent of total compensatory amount.

The population of claims available in the NAIC surveys is relatively sparse and for certain important categories of claims it is extremely small. Information is only available for 19 verdicts

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that itemized punitive damages in the combined data from the 1991, 1993 and 1995 surveys. This limited data source does not support detailed modeling of many of the relationships among the different variables being studied. Many assumptions about these relationships and hence many aspects of the structure of the model that we have developed to evaluate the effect of these reforms are based largely on judgment. We hope that additional data sources will become available that will support further testing and refinement of these assumptions.

Using data from itemized verdicts, we made the following assumptions:

1) Large total awards are more likely to have a punitive damage component.

2) If there is a punitive component, the portion of the total indemnity that it comprises is uniformly distributed from 0% to 100%.

3) For General Liability, the ratio of non-economic to economic damages is independent of award size.

4) Large awards with multiple defendants are more likely to involve joint and several liability.

In addition based on judgment we have assumed:

1) The probability of a claim being BI varies by size of loss.

2) PD claims have no significant chance of involving punitive or non-economic awards.

3) The likelihood that multiple defendants are involved and the number of defendants is independent of the modeled defendant's pre-reform award amount.

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4) The claim size distribution of claims with a punitive damage component represents a scalar expansion of the claim size distribution for all claims (i. e., If c is the ratio of the average claim size for claims including a punitive damage component to the average claim size for all claims and $X is the value of the nth percentile (for any real number n, $0<n<100$) of the claim size distribution for all claims then cX (c times $X) is the nth percentile of the claim size distribution for claims including a punitive damage component)

5) The claim size distribution of multiple defendant claims impacted by joint and several liability represents a scalar expansion of the claim size distribution for all multiple defendant occurrences

We could simulate each probabilistic characteristic of each simulated claim. Instead we choose to only simulate claim size from the inverted truncated Pareto distribution. For each simulated claim, we model each possible combination of values of the other variables and weigh all of the resulting combinations by weights derived from the empirical probability distributions estimated from the closed claim study data. This event tree structure embedded in the simulation reduces the risk of significant bias resulting from a very large claim having an extreme value of one or more of the variables other than claim size.

For each simulated claim, 168 scenarios representing possible combinations of values of the other modeled variables are weighed together to produce the estimated loss before and after each combination of the reforms being analyzed. The variables that are represented by these 168 scenarios are.

1) BI vs. PD

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2) Single vs. Multiple Defendant

3) Impacted by Joint and Several Liability vs. not Impacted

4) Percent of award comprised by a punitive damages (the mode of this distribution is 0%)

5) Percent of compensatory damages that are non-economic.

Each possible combination of reform provisions are applied to the simulated claims. For this analysis we model a reform comprised of the following components:

1) Cap on Non-Economic Damage Awards -$250,000 per plaintiff.

2) Cap on Punitive Awards -Greater of $100,000 or 3 x Economic per plaintiff

3) Repeal of Joint & Several Liability - Total

Exhibit 2 shows the impact on one simulated claim.

Finally, we apply policy limits to the simulated claim, both before and after the reform. A reform that limits large losses may have little effect if the policy limits are often exceeded both before and after the application of the reform.

We generated a large number of claims under the 168 scenarios. For each combination we calculated the average indemnity impact on the above reform package at several policy limits. Exhibit 3 summarizes the results of this analysis.

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EFFICIENCY OF SIMULATION

Differences in the provisions of the reforms and in characteristics of the population of insurance policies being considered will affect the convergence rate of the simulation. Evaluating the effect on policies with higher limits of liability will often require more iterations since more variation is present further out in the tail of the claim size distribution.

Our early simulations required at least hundred thousand occurrences to produce convergence for the relative impact. Millions of simulations were necessary for severity convergence, requiring over a week on a personal computer.

We improved the efficiency of our simulation using two related techniques, re-weighting and stratified sampling. Re-weighting entailed generating more occurrences of larger size, but giving them proportionally less weight. This is accomplished by modifying the function which assigns a Pareto distribution value to each randomly generated uniform distribution value. A compensating weighting function is applied to avoid the introduction of bias in the resulting claim size distribution.

Stratified sampling involves fixing the number of simulations within intervals. We cycled our generation of uniform random values within 500 equal probability intervals. This ensures adequate coverage of every part of the distribution.

ADDITIONAL AREAS FOR RESEARCH

There are a number of areas that require further research. We must develop methodologies to evaluate additional types of reforms. We need to develop methodologies to estimate the impact

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of the behavioral effects of reforms. We need to incorporate a consideration of the likelihood and potential impact of repeal or reinterpretation. Certainly, efforts to develop or find new or existing data sources should be pursued.

IX)   CONCLUSION

Actuaries are often called upon to evaluate the effect of law changes on expected insurance losses. The imposition, modification and on occasion elimination of automobile No-Fault systems in a number of states; changes in uninsured/under-insured motorist statutes; and mandated changes in Workers' Compensation benefit levels are common examples of such situations. The changes which are now referred to as tort reforms are often less well defined in their scope and impact than the above examples. They also, often, affect all lines of insurance rather than specific lines and coverages. They may often have minimal effect. At times they may only represent the codification of existing case law. At other times their effect may be significant, but only indirectly manifested, through behavioral changes that may or may not have been intended by the drafters and proponents of the legislation. The accurate analysis of tort reforms may be difficult and costly. The limits on accuracy may be significant even when talent and expense are not limiting factors.

However, in many cases waiting may not be an acceptable initial pricing strategy. First, insurers may be required by statute and/or regulation to reflect the effect of reforms immediately or by a specified data. Second, due to the slow development of some liability claims it may take a number of years for the full effect of changes to enter into the data. Third, some changes may have significant effects and the potential error resulting from delaying reflection of the change may be greater than the potential error resulting from analyses based on limited or imperfect data.

There may be political and regulatory pressure to reflect changes, even if their effect is at first questionable. Trade groups for a number of industries as well as Think Tanks, political

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groups and elected officials have made substantial, perhaps sometimes overstated, claims about the cost savings and other benefits that might result from the reforms that they support. When such reforms are enacted (even if they have been weakened significantly by amendment) elected officials and the public expect significant savings to be realized quickly. Actuaries must evaluate these changes as accurately as possible using the limited information that is available.

We hope that his paper contributes to the continuing evolution of more accurate methods of analyzing the effect of tort reforms and other changes in the legal environment on expected insurance losses.

VIII) EXHIBITS

1 - Truncated Pareto Formulas

2 - Impact of Sample Reform on one simulated claim.

3 - Average Impact of Sample Reform by Policy Limit.

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Exhibit 1
Page 1

Truncated Pareto Formulas

Definitions

B,Q	= Pareto parameters
T	= truncation point
P	= probability that an occurrence is less than T
S	= average size of an occurrence less than T
ABT,BBT	= exponential fit parameters (from P,S and T)

Formulas for Truncated Pareto:

(1) Probability Density Function:

$$h(X) = \begin{cases} e^{ABT \cdot X + BBT} & \text{for } 0 \le X \le T \qquad \text{Exponential fit} \\ \dfrac{Q(1-P)(T+B)^Q}{(X+B)^{Q+1}} & \text{for } T < X \qquad \text{Pareto distribution above T} \end{cases}$$

(2) Cumulative Distribution Function:

$$H(X) = \begin{cases} \dfrac{(e^{ABT \cdot X} - 1)e^{BBT}}{ABT} & \text{for } 0 \le X \le T \\ 1 - (1-P)\left(\dfrac{T+B}{X+B}\right)^Q & \text{for } T < X \end{cases}$$

(3) Average Loss Size when Losses are limited to Policy Limit K
    (Limited Average Severity):

$$LAS = E\langle \min(X,K) \rangle = \begin{cases} K - \dfrac{(e^{ABT \cdot K} - 1 - ABT \cdot K)e^{BBT}}{ABT^2} & \text{for } 0 \le K \le T \\ PS + \left(\dfrac{1-P}{Q-1}\right)\left[(B+QT) - (B+K)\left(\dfrac{B+T}{B+K}\right)^Q\right] & \text{for } (T < K) \text{ and } (Q \ne 1) \end{cases}$$

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Exhibit 1
Page 2

Inversion of Truncated Pareto Formulas

Starting with the cumulative distribution function.

$$H(X) = \begin{cases} \dfrac{\left(e^{ABT \cdot X} - 1\right)e^{BBT}}{ABT} & \text{for } 0 \leq X \leq T. \\[3mm] 1 - \left(1 - P\right)\left(\dfrac{T + B}{X + B}\right)^{Q} & \text{for } T < X \end{cases}$$

Solving for X in terms of H gives us:

$$X(H) = \begin{cases} \dfrac{\ln\left(1 + ABT \cdot H \cdot e^{BBT}\right)}{ABT} & \text{for } 0 \leq H \leq P. \\[3mm] \left(B + T\right)\left(\dfrac{1 - P}{1 - H}\right)^{1/Q} - B & \text{for } P < H \leq 1. \end{cases}$$

By generating uniform random values for H (from 0 to 1), X(H) gives us simulated indemnity values for our truncated Pareto distribution.

Notation and Parameters

Occurrence Indemnity Size Model - Truncated Pareto Distribution

B	33,947.174	Pareto Scalar
Q	1.300	Pareto Thinness of Tail
P	0.869	Probability of an Occurrence being less than T.
S	2,925.631	Average (indemnity) size of an Occurrence less than T.
T	10,000	Truncation point of Model
ABT	-0.0002797	1st Parameter below truncation point (from P,S,T)
BBT	-8.2591837	2nd Parameter below truncation point (from P,S,T)
	From Prem-Ops Table 2.	

Non-Economic Damages Model: Cycle %NE through empirical quantiles:

0.0%	18.2%	38.6%	56.5%	70.0%	82.7%	93.4%	100.0%

BIwt   0.87 Avg.Weight of BI, in layer above $100,000.

               0.60 Avg.Weight of BI, in layer below $100,000.

Pun_sz   2.0 = AvgSev(occurrences with punitive)/AvgSev(All occurrence)

Pun_a   5.0% Overall Probability of a BI occurrence having a punitive component.

Mult   0.40 Chance of a claim involving Multiple defendants

JS_sz   1.20 Relative Size of J&S claims. (From Closed claim study: $280k / $231k)

JS_a   15.0% Overall J&S Prob, given a BI occurrence with multiple defendants.

Xc   250,000 Parameter in Estimates of Total Size of All-defendant award and J&S impact.

Js_Sm   0.60 Impact of (Elimination of) J&S on claims smaller than Xc.

Js_Lg   0.30 Marginal Impact of (Elimination of) J&S on claims larger than Xc.

I.   Simulate One Occurrence

1     $H =$ Random Variable underlying simulated indemnity size.

       We could generate this from a uniform distribution from 0 to 1.

       For our study we used stratified sampling:

        generating one from 0 to 0.002, the next from 0.002 to 0.004, etc.

       We also used reweighting to generate more large values of H, but giving each less weight

     $=$ 0.989988

2     $X =$ Indemnity. Uncensored, Pre-reform.

       We invert the CDF representing the Occurrence Size Distribution.

       For this study we used a Truncated Pareto Approximation (See Exhibit 1)

       $X = Ln(1 + abt\ H\ Exp(-bbt))/abt$ OR $(B+T)[(1-P)/(1-H)]^\wedge(1/Q) - B$.

     $=$ 283,640

3 PunProb$=$ probability that a BI occurrence of size X involves punitive damages.

     $=$ $p(pun|x)$

     $=$ $p(pun) * [f(x|pun) / f(x)]$

      Assuming that the pdf of $f(x|pun)$ represents a scalar expansion of $f(x)$

      (that the distribution of punitives is the same, except for a constant multiplier):

            $f(x|pun) = f(x\ /\ Pun\_sz) / Pun\_sz$

     $=$ $(Pun\_a/Pun\_sz) * [f(x/Pun\_sz) / f(x)]$

     $=$ $(Pun\_a/Pun\_sz) * [Q(1-P)(T+B)Q([X/Pun\_sz]+B)-(Q+1) / Q(1-P)(T+B)Q(X+B)-(Q+1)]$

     $=$ $(Pun\_a/Pun\_sz) * [([X/Pun\_sz]+B)-(Q+1) / (X+B)-(Q+1)]$

     $=$ $(Pun\_a/Pun\_sz) * [(X+B) / ([X/Pun\_sz]+B)]\ Q+1$

     $=$ $(0.05 / 2.00) \quad * \quad 3.90$

     $=$ 0.09747

4   JSProb$=$ Probability that an occurrence of size X is impacted by Joint & Several Liability,

         given that it has multiple defendants.

        Using the same assumptions as in PunProb.

     $=$ $p(JS) * [f(x|JS) / f(x)]$

     $=$ $(JS\_a/JS\_sz) * [f(x/JS\_sz) / f(x)]$

     $=$ $(JS\_a/JS\_sz) * [(X+B) / ([X/JS\_sz] +B)]^{Q-1}$

     $=$ $(0.15 / 1.20) \quad * \quad 1.45$

     $=$ 0.18109

5 Simulate various scenarios underlying this occurrence.

Single Defendant, Multiple Defendants w/o Joint Liability, Multiple Defendants with J&S.

Each of the those 3 are broken into 7 possiblities
  If BI, assume six possibilities, with varying punitive components:
  One with No Punitive (Punitive = 0% of Award)
  Five with Varying Punitives of 10%, 30%, 50%, 70% or 90%

If PD, assume only one possibililty, punitive of 0%

Each of the above 21 are then calculated with 8 values of NE%.
  If BI, percentage of non-punitive (compensatory) damages given by non-economic damages

For PD, we currently assume the entire damages are economic, so NE% has no effect.

The Following 8 values of NE% are used with equal weight:
  0 0%   18.2%   38.6%   56.5%   70 0%   82.7%   93.4%   100.0%

This makes 168 (=3x7x8) distinct scenarios:

Here we display the calculations for four (of the 168) scenarios:

A) BI, Single Defendant, No Punitive
If the insured is the only defendant, then Joint and Several cannot apply.

B) BI, Single Defendant, 90% Punitive
As "A" above, but the **same size** loss now consists mostly of punitive

C) BI, Multiple Defendants, but without Joint & Several, 50% Punitive
Now the insured's loss is part of a larger verdict The verdict is half-punitive.

D) BI, Multiple Defendants, Joint & Several invoked, 50% Punitive
Similar to "C", but part of the insured's loss was from other defendants.
Due to reform (repeal) of the J&S doctrine, this extra amount is now a savings.

Each uses   **56.5%**   for NE%

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Scenario:	**A**	**B**	**C**	**D**	
Defendants	Single	Single	Multiple	Multiple	
J&S Applies	n/a	n/a	No	Yes	
Punitive Damages	0%	90%	50%	50%	
Weight (BI vs PD)	0.8700	0.8700	0.8700	0.8700	BIwt or 1-BIwt
Weight (of # of Def)	0.6000	0.6000	0.4000	0.4000	Mult or 1-Mult.
Weight (of J&S)	1.0000	1.0000	0.8189	0.1811	1, JS_Prob or 1-JS_Prob.
Weight (of Punitive)	0.9025	0.0195	0.0195	0.0195	=PunProb/5 or 1-PunProb
Weight (of NE%)	0.1250	0.1250	0.1250	0.1250	= 1/ (# of NE quantiles)
6 Scenario Weight**	0.0589	0.0013	0.0007	0.0002	Product of weights

* For cases with punitive. Otherwise Weight = 1-PunProb

** The weights for the twenty-one scenarios with this NE% add up to .125.
The weights for all 168 scenarios add up to 1.000.

7 Verdict Size=   283,640   283,640   542,051   542,051
Total award (verdict or settlement) to plaintiff from ALL defendants.
If Single Defendant = X
If Multi-Defendant = X * 2 (if X< Xc)
        Xc*2 + (X-Xc)*1.25 (if X> Xc)

8 Xjs =   283,640   283,640   283,640   160,092
   Loss: J&S reduced   If J&S impacted this occurrence, how large would it have been without it?
If Multi-Defendant = X * JS_Sm (if X < Xc)
        Xc*JS_Sm + (X-Xc)* JS_Lg (if X > Xc)

9 PunOld (after J&S)=   -   255,276   141,820   80,046
Punitive calculated as our scenario %, of the post-Joint & Several loss.
   = Xjs * Pun%

10 NeOld(after J&S)=   160,257   16,026   80,128   45,226
Non-Economic = Xjs * (1-Pun%) * NE%

11 EcoOld(after J&S)=   123,384   12,338   61,692   34,820
Economic   = Xjs - NeOld- PunOld

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Scenario:	<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>	
12 Cap on Non-Eco					
0*Economic					Variable Cap
Min. Cap		250,000			Minimum Cap
Max Cap					Maximum Cap
Net Cap per plaintiff	250,000	250,000	250,000	250,000	
Cap by defendant	250,000	250,000	130,818	130,818	= Net Cap * (X/Verdict)
13 Cap on Punitive					
3*Economic	370,151	37,015	353,688	353,688	Variable Cap
Min Cap		100,000			Minimum Cap
Max Cap					Maximum Cap
Net Cap per plaintiff	370,151	100,000	353,688	353,688	
Cap by defendant	370,151	100,000	185,075	185,075	Entire punitive cap
14 Capped Punitive	-	100,000	141,820	80,046	
15 Capped Non-Eco	160,257	16,026	80,128	45,226	
16 Xref =	283,640	128,364	283,640	160,092	
Post Reform Loss:	=EcoOld + Capped Punitive + Capped Non-Eco				

17 Calculate the Limited Loss, and calculate the average weighted across all 168 scenarios.
  (We cannot just calculate the Limited Average, we need the average of the Limited)

  We calculate these Average Limited Losses for Five Sample Policy Limits.
        $100,00   500,000 1,000,000   10,000,000 unlimited

  We should calculate these values reflecting various combinations of reforms.
        Elimination of Joint&Several.
        J&S + Cap on Non-Economic Damages
        All three (J&S, Non-Eco and Punitive) reforms.

	$\underline{A}$	$\underline{B}$	$\underline{C}$	$\underline{D}$	Weighted Avg of. Displayed $\underline{21}$	All $\underline{168}$
Post-Reform						
Min(Xref,100k)=	100,000	100,000	100,000	100,000	99,893	99,608
Min(Xref,500k)=	283,640	128,364	283,640	160,092	261,946	249,422
Min(Xref. 1 M)=	283,640	128,364	283,640	160,092	261,946	249,422
Pre-Reform						
Min(X , 100k)=	100,000	100,000	100,000	100,000	100,000	100,000
Min(X , 500k)=	283,640	283,640	283,640	283,640	283,640	283,640
Min(X , 1 M)=	283,640	283,640	283,640	283,640	283,640	283,640

Note that all 168 scenarios will be identical under pre-reform conditions

II. Repeat simulation until results converge.

For each of limited loss in step one, calculate the Mean value.

100,000 random simulations is sufficient to generate stable % changes at each relevant limit
But more are needed for Limited Average Severities stable in absolute dollars.

We used reweighting and stratified sampling to improve our efficiency

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	H	X(H)	Which		P(Pun>0 | x)		\$100,000	\$1,000,000	Unlimited
	Pareto	Old Indem.	Non-Eco	NE/NP	punprob	J&s Prob	\$100,000	\$1,000,000	Unlimited
	0.9900	**283,640**	**4**	**56.50%**	**0.0974694**	**0.181091**	**100,000**	**283,640**	**283,640**
				BIProb	87.0%				

Total Losses before caps Limited to:

		Entire Verdict			Ratio of Several to Joint		Total Losses after J&S Reform Limited to:		
	If Single Defendant	283,640			if Joint applies:	0.5644	**100,000**	**274,691**	**274,691**
	If Multi Defendants	542,051			if not:	1.0000			

		Scenario	Losses before Cap (but after J&S)			Losses after Caps		Total Losses after caps Limited to:		
	Punitive	Weight	Economic	Non-Eco	Punitive	Non-Eco	Punitive	\$100,000	\$1,000,000	Unlimited
BI	0.0%	0.05889	123,384	160,257	-	160,257	-	100,000	283,640	283,640
Single	10.0%	0.00127	111,045	144,231	28,364	144,231	28,364	100,000	283,640	283,640
Defend	30.0%	0.00127	86,369	112,180	85,092	112,180	85,092	100,000	283,640	283,640
	50.0%	0.00127	61,692	80,128	141,820	80,128	141,820	100,000	283,640	283,640
	70.0%	0.00127	37,015	48,077	198,548	48,077	111,045	100,000	196,137	196,137
	90.0%	0.00127	12,338	16,026	255,276	16,026	100,000	100,000	128,364	128,364
BI	0.0%	0.03215	123,384	160,257	-	130,818	-	100,000	254,202	254,202
Multi-	10.0%	0.00069	111,045	144,231	28,364	130,818	28,364	100,000	270,228	270,228
Defend	30.0%	0.00069	86,369	112,180	85,092	112,180	85,092	100,000	283,640	283,640
No J&S	50.0%	0.00069	61,692	80,128	141,820	80,128	141,820	100,000	283,640	283,640
	70.0%	0.00069	37,015	48,077	198,548	48,077	111,045	100,000	196,137	196,137
	90.0%	0.00069	12,338	16,026	255,276	16,026	52,327	80,691	80,691	80,691
BI	0.0%	0.00711	69,640	90,452	-	73,836	-	100,000	143,476	143,476
Multi-	10.0%	0.00015	62,676	81,407	16,009	73,836	16,009	100,000	152,522	152,522
Defend	30.0%	0.00015	48,748	63,316	48,028	63,316	48,028	100,000	160,092	160,092
	50.0%	0.00015	34,820	45,226	80,046	45,226	80,046	100,000	160,092	160,092
J&S	70.0%	0.00015	20,892	27,136	112,064	27,136	62,676	100,000	110,704	110,704
	90.0%	0.00015	48,748	63,316	48,028	63,316	48,028	100,000	160,092	160,092
PD										
Single	0.0%	0.00975	283,640					100,000	283,640	283,640
No J&S	0.0%	0.00532	283,640					100,000	283,640	283,640
J&S	0.0%	0.00118	160,092					100,000	160,092	160,092
Weighted Total		0.12500	16,831	16,064	1,441	14,989	923	12,487	32,743	32,743
(Normalized)			134,652	128,511	11,529	119,910	7,384	99,893	261,946	261,946

Numbers in shaded regions include reduction for impact of J&S.

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Exhibit 3

The Analysis of the Effect of Tort Reform Legislation on Expected Liability Insurance Losses
Overall Effect on Average Severity

Unlimited Indemnity[*], by Component

Component	Reforms: None		J&S Only		J&S and Non-Eco		All
Economic	$	12,037	$	11,591	$	11,591	$	11,591
Non-Economic		9,956		9,562		4,901		4,901
Punitive		885		840		840		487
Total		22,878		21,993		17,331		16,978

Limited Average Indemnity Severity[*]

Policy Limit	Reforms: None		J&S Only		J&S and Non-Eco		All
$100,000	$	9,304	$	9,157	$	9,131	$	9,126
$500,000		13,967		13,656		12,958		12,859
$1,000,000		15,599		15,199		13,889		13,740
$10,000,000		19,281		18,645		16,553		16,246
Unlimited		22,878		21,993		17,331		16,978

% Change in Limited Average Severity[*]

Policy Limit	Reforms: None	J&S Only	J&S and Non-Eco	All
$100,000	n/a	-1.6%	-1.9%	-1.9%
$500,000	n/a	-2.2%	-7.2%	-7.9%
$1,000,000	n/a	-2.6%	-11.0%	-11.9%
$10,000,000	n/a	-3.3%	-14.1%	-15.7%
Unlimited	n/a	-3.9%	-24.2%	-25.8%

[*]   Result of 160,000 simulated Premises and Operations occurrences.

[**]   Simulated Reforms:
         Complete abolishment of Joint & Several Liability.
         Unconditional cap of $250,000 on Non-Economic awards.
         Cap on Punitive awards of greater of $100,000 or 3xeconomic.