ECONOMIC ANALYSIS GROUP
DISCUSSION PAPER

Tort Liability and Settlement Failure: Evidence on Litigated Auto Insurance Claims

by

Danial Asmat and Sharon Tennyson*

EAG 16-1 January 2016

* Asmat: Economic Analysis Group, Antitrust Division, U.S. Department of Justice, danial.asmat@usdoj.gov.
Tennyson: Cornell University, Department of Policy Analysis & Management, sharon.tennyson@cornell.edu.
The views expressed in this paper are those of the authors and are not purported to reflect the views of the U.S. Department of Justice.

Tort Liability and Settlement Failure:

Evidence on Litigated Auto Insurance Claims

Danial Asmat and Sharon Tennyson*

January 24, 2016

Abstract

This paper empirically tests the predictions of the Priest-Klein model of pre-trial bargaining. It exploits variation in tort liability for bad faith insurance law across states and time during two decades of evolving law from the 1970s to the 1990s. Using repeated cross-sectional datasets of auto insurance claims from the Insurance Research Council, it finds evidence consistent with the hypothesis that variance in parties' subjective estimates of trial outcomes drove the likelihood of settlement. The likelihood of trial for an average claim is estimated to have risen by over 20% in the initial years following reform among the first group of states to enact the tort remedy. Trial rates among tort states thereafter declined through the sample, dropping over 10% below control states by 1997. A similar relationship is estimated for the likelihood of a lawsuit being filed, and characteristics of litigated claims are consistent with a different subset of claims being disputed following regime change. Results are robust to sample selection bias, endogeneity in settlement time, and other state-level legislation on punitive damages limits and prejudgment interest. While there is limited evidence for the predictions of asymmetric information models of settlement, we conclude that policyholders and insurers negotiated in a manner consistent with divergent expectations.

JEL Classification: K41, K13, D81

Keywords: punitive, damages, bargaining, tort, settlement, litigation, insurance

*We thank the Insurance Research Council for generously providing the data used for this study. We are also indebted to seminar participants at the University of Michigan, the EGRIE meetings, and others for helpful comments and discussions. All errors are our own. The views expressed are not purported to reflect those of the U.S. Department of Justice.

1 Introduction

The theory of law and economics has long emphasized the link between legal rights and settlement bargaining. It has shown that the welfare effects of rights, such as those granted under tort law, depend critically on the comparative statics of pre-trial bargaining. Among the most important of these are the likelihood that a dispute reaches litigation and the likelihoood that litigation reaches trial.[1] It is well known, for example, that civil case backlog at the county, state and federal levels imposes costly strain on the American legal system.[2]

But there remain different frameworks to analyze breakdown in pre-trial bargaining. Divergent expectations models of litigation posit that parties hold mutually optimistic assessments of their chances at trial.[3] Parties fail to settle if the litigation costs of trial are small enough to justify the expected utility gain of trial relative to settlement. Asymmetric information models, in contrast, assume that one party holds an objectively correct prior assessment of the expected trial judgment.[4] The other party knows only the distribution of priors. If the plaintiff is uninformed, she may demand a settlement amount that is greater than the expected cost the defendant would expect to pay at trial, which causes disagreement.[5]

In this paper, we present an empirical analysis of settlement behavior following a change in the body of law and show that it is consistent with the divergent expectations model proposed by Priest and Klein (1984). We focus on the evolution of insurance "bad faith" law, one of the most active areas of civil liability expansion in the United States over the closing decades of the twentieth century. Insurance law requires providers to deal fairly, thoroughly, and promptly in settling insurance claims with policyholders. Breach of this duty constitutes a bad faith liability. Policyholders who dispute the value of a claim can sue their insurer for underpayment, and also for bad faith negotiation.

[1] Throughout the paper, we use "litigation" to mean the presence of a suit filed by plaintiff against defendant.

[2] See http://www.wsj.com/articles/in-federal-courts-civil-cases-pile-up-1428343746 for a recent description of the causes and consequences of federal case backlog.

[3] These models date to the early literature on law and economics; see Landes (1971), Gould (1973), Posner (1973), Landes and Posner (1979), and Shavell (1982).

[4] Seminal models based on screening between informed types include Bebchuk (1984), P'ng (1983), and Spier (1992). Seminal models of signaling between plaintiff and defendant include Reinganum and Wilde (1986) and Nalebuff (1987). See Spier (2007) for a review of asymmetric information models.

[5] The comparative statics of settlement probability in such models are typically invariant to whether the plaintiff or the defendant has the informational advantage.

Specifically, we estimate how the tort remedy for first-party bad faith changed the incidence of settlement failure between automobile insurers and their policyholders.[6] We exploit three primary sources of explanatory power to test the model. First, states differ in whether they recognize a cause of action for the tort of bad faith. This creates two groups of states that differ in two ways: the standard necessary to establish bad faith and the magnitude of damages once it has been established. In New York, for example, common law takes the traditional position that bad faith dealings are a part of contract law.[7] Because the state does not recognize bad faith as an independent cause of action, liability would typically entitle plaintiffs to the compensatory value of the claim, but no extra-contractual or noneconomic damages. In Wisconsin, however, common law recognizes bad faith and adjudicates it as a tortious harm.[8] To establish bad faith liability in Wisconsin, plaintiffs must convince the court that the insurer's behavior meets elements of both an intentional and negligence standard.[9] A liability finding would grant plaintiffs compensatory damages, as well as consideration for additional awards: economic harm above the policy limits, emotional distress, and expressly punitive damages.[10]

Second, states changed bad faith regimes at different points in time, and state-level reform has undergone a relatively discrete start and finish. The Priest-Klein model distinguishes between transitory and permanent levels of uncertainty in beliefs about trial success. To avoid conflating the two, it is necessary to estimate how comparative statics change over time. It is also necessary for the degree of liability and evidentiary standards within states to stabilize, so that it is possible to distinguish short- from long-term effects. The study of bad faith law makes such an analysis possible: states began determining adjudication for first-party bad faith following a landmark 1973 California decision.[11] In the subsequent two decades, the majority of states followed California by granting a tort-based cause of action for bad faith, while others clarified that

---

[6]This paper's exclusive focus is on first-party rather than third-party bad faith insurance. Bad faith is used to mean "first-party" throughout the paper, unless otherwise noted. See section 3 for the distinction between the two types of insurance.

[7]*Gordon v. Nationwide Mut. Ins. Co.*, 30 NY. 2d 427 (1972).

[8]*Anderson v. Continental Insurance Co.*, 85 Wis.2d 675, 271 N.W.2d 368 (1978). Most states that recognize a private cause of action for first-party bad faith adjudicate it through tort law. Several states do recognize the cause of action but adjudicate it through contract or statute; see further details in section 3, and a wider discussion in Tennyson and Warfel (2010).

[9]See Sykes (1996), pp. 411-412. The *Gordon* standard is the most common model for first-party bad faith around the country.

[10]Punitive damages have been granted in a number of such cases and follow naturally from the tort of bad faith. As Sykes (1996) explains: "once 'bad faith' is established under the applicable standard, the full array of tort remedies generally becomes available...[and] because 'bad faith' can often be characterized as 'reckless,' 'malicious,' 'wanton,' and the like, many plaintiffs will be able to collect punitive damages."

[11]*Gruenberg v. Aetna Ins. Co.*, 510 P.2d 1032, 1037-38 (Cal. 1973). *Gruenberg*, the other primary model that states use for first-party bad faith, is commonly understood to be less narrow than *Gordon*.

it did not exist. After the early 1990s, only a handful of states would modify existing bad faith regimes significantly.[12]

Finally, auto insurance claims provide a set of frequent, high-information bargaining events against the backdrop of a trial. Changes in bad faith insurance law are unlikely to induce significant changes in the primary incentives to file a claim. Because the law pertains to an insurer's liability for bad faith, and not more generally to an individual's liability for personal injury or property, a bad faith tort can occur only *after* a claim has been filed. This stands in sharp contrast to more widely studied applications of tort law: auto accidents, medical malpractice, and products liability.[13] We present a model that builds on these three institutional features of bad faith insurance: variation in state law, variation over time, and the distribution of underlying claims between the two legal regimes. The model develops conditions under which a sample of insurance claims from states with and without tort liability can identify the effect of the law on settlement failure probabilities.

Such a sample is employed with the Insurance Research Council's national decennial survey of auto insurance claims. We build a repeated cross-sectional dataset with survey responses from 1977, 1987, and 1997. We exploit natural variation in state bad faith regime and time to directly identify the effect of the law on the probability of settlement failure. We examine binary measures of settlement failure at two different stages of the negotiation process. The first measure of settlement failure is whether the policyholder filed suit against his insurer, as opposed to settling without suit. The second measure is whether, conditional on the policyholder filing suit, the claim proceeded to trial as opposed to settling out of court.[14] We also use data on the policyholder's settlement demand, as well as claimant- and accident-specific variables, to analyze how the types of claims that proceed to each stage of the negotiation process differ between legal regimes.

Empirical estimates of the effect of bad faith tort liabilty on settlement failure support the predictions of the Priest-Klein model. The strongest finding pertains to the likelihood of an insurance claim to proceed to trial conditional on the case entering litigation. The likelihood of an average claim being closed in trial rose

[12]There are two primary reasons. Where states treated bad faith as common law, judicial precedent clarified the scope and limitations of the law and increased the predictability of judgments. In addition, nationwide doctrinal debates surrounding tort and medical malpractice liability spurred courts to examine bad faith during the 1960s and 1970s. This movement slowed down by the 1990s. See Abraham (1994) for a full analysis of the maturity of bad faith law.

[13]See Kessler and Rubinfeld (2007) for a survey of these literatures.

[14]The dataset contains only closed claims. Therefore it does not contain any cases in which the policyholder "dropped" the lawsuit. See Katz (1990) for an empirical study examining drop rates for medical malpractice claims.

by over 20% among tort states in the earliest years following their regime change, relative to non-tort states. Trial likelihood in tort states thereafter declined steadily, dropping over 10% below other states by the end of the sample. Together, these facts are consistent with theory that selection operates on cases closest to the decision standard. The tort liability regime changed the types of cases selected for trial. It increased the variance of the error with which parties estimated potential trial outcomes. As the decision standard for the tort regime solidified over time, the regime's level of uncertainty changed from a mixture of transitory and permanent levels to a solely permanent level. A narrower range of disputes around the standard survived to trial, so that the density of trials decreased.

We find a similar pattern for the likelihood of litigation, i.e., a policyholder filing suit against his insurer. We estimate a positive effect of bad faith tort liability on the suit probability of an average claim of nearly 5% in the early- and intermediate-phase of bad faith reform, but a negative effect in the long-term. Regression specifications control for numerous characteristics that exogenously impact the likelihood of settlement, including economic loss claimed, attorney use, degree of injuries suffered, and other state-level legislation on punitive damages and prejudgment interest. Results are robust to sample selection bias with respect to the timing of legal changes, as well as to endogeneity of the time between a claim's filing and settlement. We conclude that the combination of the two changes associated with tort liability—the level of uncertainty and the stakes of the case—created two discrete effects on the likelihood of settlement failure for first-party bad faith auto insurance claims. The short-term effect of uncertainty significantly increased litigation and trial rates among tort states in the 1970s and 1980s. But steadily declining uncertainty about bad faith tort law, in tandem with limits on punitive damages and gradually narrowing doctrinal scope for bad faith tort liability, eventually reduced the scope for disagreement in settlements. This has ultimately reduced the overall strain that settlement failure in first-party auto insurance claims imposes upon the legal system.

While these results are in line with divergent expectations models, they are inconsistent with the full implications of asymmetric information models of settlement. To better distinguish between the two types of canonical models, we examine the economic loss that the policyholder claimed. This constitutes a direct proxy for her settlement demand—typically unobservable in bargaining settings—which is the central lever that drives comparative statics results in asymmetric information models. We find that policyholders' average settlement demand changed non-monotonically through the sample period. This is at odds with both screening-based models of settlement, which predict a monotonic increase, and signaling-based models, which predict a decrease. There is, however, evidence that the settlement demand was correlated with the likelihood of litigation, as both screening and signaling models predict.

This paper makes two primary contributions. The first is to empirically test the divergent expectations model of pre-trial settlement bargaining.[15] We follow Priest (1987), Hughes and Snyder (1995) Waldfogel (1995), Siegelman and Donohue (1995), Kessler, Meites and Miller (1996), Waldfogel (1998), Siegelman and Waldfogel (1999) and Eisenberg and Farber (2003) in testing the Priest-Klein model of settlement.

In contrast to studies that focus on a limiting prediction of the model—50% win rates for plaintiffs and defendants—we assess its broader implication that the selection of disputes for litigation or trial is based on parties' subjective assessments of trial outcomes. Our study is closest to Priest (1987) in estimating the effects of legal uncertainty about a decision standard. We show that litigation and trial rates for a similar set of disputes increased dramatically under a new legal regime, but eventually decreased following the regime's maturation. Combined with descriptive evidence of different accident characteristics between the two regimes, this evidence is consistent with variation in the precision of future trial outcomes driving parties' settlement decisions. More generally, it is also consistent with disputes for litigation or trial being systematically selected on the basis of proximity to a legal standard.

Other empirical evidence on litigation and trial outcomes is also consistent with divergent expectations models. While there is limited evidence for the predictions of asymmetric information models, the literature does show that the direction of comparative statics may depend on the types of disputes considered.[16] Viscusi (1988) and Perloff, Rubinfeld and Ruud (1996) specify models of litigation and settlement in products liability and antitrust claims, respectively. Consistent with both types of canonical models, they find that trial probability increases with the size of the case and decreases with the variance of outcomes and the magnitude of risk aversion. Fournier and Zuehlke (1989), in contrast, study a broader database of civil suits. They find that larger expected payments are associated with greater rates of settlement, an outcome

[15] A developing line of research documents and explains the existence of partial settlements between the two extremes of completely contingent settlement out of court and completely incontingent litigation in court. See Prescott, Spier and Yoon (2014), Prescott and Spier (2015*a*) and Prescott and Spier (2015*b*).

[16] See Farber and White (1991) and Farber and White (1994) for empirical evidence of screening in medical malpractice litigation.

of divergent expectations but not screening with asymmetric information. Johnston and Waldfogel (2002) exploit federal litigation data that identifies attorney representation to show that increased interactions speed dispute resolution and raise the probability of settlement. The present study emphasizes that the variance in parties' subjective probability estimates may change over time to greatly shape the direction of comparative statics.

The second contribution is to estimate the shadow effect of a change in tort liability, specifically, on the likelihood of litigation. We specify a model of insurance claims in the spirit of previous empirical analyses of malpractice claims (Danzon and Lillard, 1983; Hughes and Snyder, 1989), auto insurance claims (Kessler, 1996; Browne and Schmit, 2008), and civil litigation cases more generally (Eaton, Mustard and Talarico, 2005).

Our paper is unique among this group in exploiting variation on the extensive margin of tort law—from no cause of action to a tort-based cause of action—rather than on the intensive margin, from an unrestricted tort right to a tort right restricted by caps on various damages. Perhaps for this reason, many of these studies fail to find significant effects of damage changes on litigation outcomes. Kessler and McClellan (2005) find that tort caps reduce lawsuit incidence by only about 2%. Kessler (1996) finds that tort reforms mandating prejudgment interest for winning plaintiffs increase settlement delay in auto insurance claims, and Eaton, Mustard and Talarico (2005) find no evidence of punitive damages on settlement rates or amounts in civil cases throughout the state of Georgia.

The outline of the paper is as follows. Section 2 develops a model of pre-trial negotiation pertaining to bad faith insurance settlements and to the structure of the dataset presented. Section 3 details the data used for empirical analysis and presents descriptive evidence consistent with the model. Section 4 econometrically estimates the relationship between tort liability and settlement failure over time. We conclude in section 5 by discussing implications for the economic theory of settlement and the policy debate on insurance tort reform more generally.

2 Theoretical Framework

2.1 Model Preliminaries

We adopt a divergent expectations model of bargaining in the form of Priest and Klein (1984) and apply it to the bad faith insurance setting. The model compares the probability of an insurance claim from two different bad faith regimes settling over different time periods. Consider one insurance company, D, that is charged with settling first-party insurance claims from the set of its policyholders, P. Each realized claim x is filed by policyholder P_n, $n \in \{1, \dots, N\}$. P_n and D bargain over the amount of compensation for the claim.

Settlement occurs if the minimum amount demanded by P_n is less than or equal to the maximum settlement offer from D. There are three discrete stages of the settlement process, indexed by s. Parties hold full information about the timing of the process and the options to settle or prolong the negotiation at each stage. Figure 1 represents the three stages of negotiatiation, which culminate in a court or jury trial.

[Figure 1 about here.]

At the first stage, the two parties bargain after a claim has been filed. If they agree on a settlement amount, claim x "closes" within this stage and never reappears. Should they fail to reach an agreement, P_n files suit against D for a breach of insurance contract. P_n can also allege a supplementary charge that I negotiated in bad faith with P_n.

If P_n files suit, then the bargaining process repeats at the second stage. If they fail to reach an agreement at the second stage, the negotiation over x proceeds to the third and final stage: trial. Parties hold full information about the amount at stake in the trial, judgement $J \geq 0$. This judgment may include compensatory damages for bad faith, if it is alleged. The judgment award J from D to P_n closes the claim in stage three.

If x is in stage one or stage two, P_n and D formulate settlement demands and settlement offers, respectively. They formulate subjective probabilities $\pi^i \in [0, 1]$, $i \in \{P_n, D\}$, that P_n would win trial against D. Party i's optimism about trial success is weighed against his cost of prolonging the negotiation, $r_s^i(J) > 0$, $s \in \{1, 2\}$, where s denotes the stage of negotiation. Let $r_1^i(J) < r_2^i(J) \; \forall \; J$: the cost of settlement failure is strictly greater in the second stage, when trial results, than in the first stage, when lawsuit merely results.[17] Assume also that $\frac{\partial r_s^i}{\partial J} > 0$: litigation cost is increasing in the size of the judgment.

Denoting $r_s(J) = r_s^P(J) + r_s^D(J)$, a first or second stage claim fails to settle in that period if and only if:

$$J\pi^P - r_s^P(J) > J\pi^D + r_s^D(J) \tag{1}$$

$$\pi^P - \pi^D > \frac{r_s(J)}{J} \tag{2}$$

The standard condition in 2 implies that the minimum asking price of P_n exceeds the maximum offer of D at stage s. The assumption that $r_1^i(J) < r_2^i(J)$ guarantees that parties are more willing to settle at the second stage than the first stage.

The defining feature of the Priest-Klein model is its endogenous formulation of subjective trial assessments π^i. Settlement fails to occur if parties hold sufficiently optimistic expectations of their chances at trial. A difference in optimism is determined by two factors. The first is the relationship between the legal facts of the claim and the correctly administered decision standard. Each claim x contains a different mixture of bargaining characteristics. These include the timing and nature of initial contact between policyholder and insurer, the manner of claim appraisal and evaluation, the settlement offer, threats made to agree to the settlement offer, and more generally, all dealings that fall under the umbrella of the insurer's "good faith duty to settle." $Y \in \mathbb{R}$ maps the mixture of characteristics associated with each claim onto a continuous measure of insurer fault. Y^* is the degree of fault necessary for a court to hold the insurer liable for bad faith under the given standard, and Y' is the particular degree of fault that x displays.

The second factor that determines π^i is error with the estimation of Y'. The facts of a claim negotiation map onto an objective assessment of the insurer's wrongdoing, but the application of those facts to the case requires careful consideration and analysis. Parties may be uncertain or disagree over the steps taken after the claim was filed or the appropriateness of various negotiation tactics. They may also disagree over the interpretation of the standard or, particularly in the bad faith setting, the expectation over the future evolution of the standard as it pertains to the claim. This measurement error creates subjective assessments

[17] Cost is comprised of attorneys' fees and opportunity cost of not settling earlier. Attorneys' fees from filing suit include initial fact finding, documentation, case review, and communication between parties. Additional costs for trial include preliminary injunctions, wiitness preparation, and testimony presentation; expenses increase sharply as a case proceeds to trial.

of the insurer's fault. Priest-Klein assume that errors are independently and identically normally distributed, so that draws in opposite directions create optimism bias.

Formally, let $\hat{Y}^i = Y' + \epsilon,\ \epsilon \sim N(0, \sigma^2)$. The probability of settlement failure at stage $s \leq 2$ is:

$$Pr[Fail_s] = F^P\left(\hat{Y}^P\right) - F^D\left(\hat{Y}^D\right) > \frac{r_s\,(J)}{J} \quad , \quad F^i\,(\cdot) = \int_{-\infty}^{\hat{Y}^i} \phi(\epsilon) d\epsilon \tag{3}$$

It is important to note that condition 3 represents unconditional probabilities of settlement failure. As such, $Pr[Fail_s]$ denotes the proportion of claims from an initial set (each beginning at the first stage) that failed to settle by stage s. Because $r_1^i(J) < r_2^i(J)$, $Pr[Fail_2] < Pr[Fail_1]$: strictly more claims will settle by stage two than by stage one. Equivalently, $Pr[Fail_2|Fail_1] = \frac{Pr[Fail_1] - Pr[Fail_2]}{Pr[Fail_1]} < 1$: some disputes that failed at stage one will settle at stage two, because litigation costs rise by enough to offset optimism bias.

Condition 3 also implies the central prediction of the Priest-Klein model. When all else is equal, claims with Y' close to Y^* are less likely to settle than claims with Y' far from Y^*. If $Y' \approx Y^*$, even a small divergence in error terms results in a relatively large area under the density curve. This enhances the probability of disagreement.

2.2 Tort Liability for Bad Faith

In this section we add a stylized representation of the bad faith legal environment to the model. We use the framework to generate predictions of the effect of bad faith tort law on the probability of settlement failure for auto insurance claims at different points in time, as well as to derive conditions under which the empirical setting identifies this effect.

Insurer D operates in two states, A and B, in each of infinitely many discrete periods of time t. D's policyholders P file a total of X_t^l new claims, $l \in \{A, B\}$, in each period t. Claims are filed according to the same distribution with respect to the liability standard, Y, in both states. Specifically, $X_t^l \sim Poisson(\lambda)$.[18] Each stage of the settlement process corresponds to one period t. The framework outlined in section 2.1 implies that the X_t^l claims can be partitioned into the subsets $X_t^{l1}, X_t^{l2}, X_t^{l3}, \cup X_t^{li} = X_t^l$. With probability

[18] This assumption can be relaxed in two ways without changing the results that follow. The mean number of claims may differ across states. The mean number of claims may also change over time, as long the change is identical across states. These points are explained further in the empirical identification discussion in section 4.

$1 - Pr[Fail_1]$, $X_t^{l1} \subset X_{lt}$ will settle in t. With probability $(Pr[Fail_1] - Pr[Fail_2])$, $X_t^{l2} \subset X_t^{l1}$ will settle in $t+1$; and with $Pr[Fail_2]$, $X_t^{l3} \subset X_t^{l2}$ will settle in $t+2$.

There are two possible bad faith regimes: no private cause of action for bad faith, which renders it part of contract law, or tort-based cause of action. States A and B do not recognize a private cause of action for bad faith in periods $[1, \ldots, t-1]$. In this interval, subjective trial assessments are made from the same decision standard, Y^*, in both states. The probabilty of settlement failure across all three stages is equal for both states. At the start of period t, state B applies a tort remedy for bad faith. All claims that are filed in period t are subject to the state's prevailing legal regime, but claims filed before t that are still in negotiation at t remain subject to the law when the claim originated.

Tort adjudication differs in two ways from conventional contract adjudication. First, tort law introduces the possibility of economic damages above the insurance policy's limits, noneconomic damages such as emotional distress, and punitive damages at the discretion of the court.[19] The model therefore specifies that the effect of tort liability is to raise the stakes of a case relative to contract liability.

Second, the change from one body of law to another alters the decision standard Y^*. A new Y^* changes the variance of parties' error, σ^2, because it carries a new level of uncertainty. Priest-Klein allows this uncertainty to change over time. Priest (1987) writes:

> One would expect virtually all changes in legal rules to upset the parties' expectations of outcomes over some period of time, however short. That is, holding constant the permanent level of rule uncertainty, one would imagine that the parties will face greater uncertainty in predictions of the initial application of a new legal standard than they will face in predictions of subsequent applications of the standard. Thus, the transitory level of uncertainty should surely decline over time as study of the rule or actual experience with implementation of the rule accumulates.

A tort change at period t implies that failure probabilities are no longer invariant across state and time. The model outlined in this section, as well as condition 3, can be used to derive comparative statics and dynamics of settlement failure with respect to each of the variables that tort law changes. The following two propositions establish testable predictions of this legal change.

[19] Some states have limitations on the extent of punitive damages desipte adjudicating bad faith through tort. Date on punitive damages reforms is described in section 3 and used in the empirical analysis.

Proposition 1. *Denote the set of claims that close in period t, in state l, and at stage s as Z_t^{ls}. Suppose that the distribution of claims with respect to Y is identical between states A and B in periods $[t-2, t-1, t]$. If tort liability raises the stakes of a claim from J_1 to $J_2 > J_1$, then:*

$$(J_2 - J_1)\left[\pi^P - \pi^D\right] > r_s(J_2) - r_s(J_1) \iff \frac{Z_t^{Bs}}{Z_t^{B1}} > \frac{Z_t^{As}}{Z_t^{A1}}$$

where $s \in \{1, 2\}$

Proof 1. *See Appendix A.1.1.*

Proposition 1 represents a familiar result in the law and economics of pre-trial settlement. Cross-sectionally, raising the stakes of a trial J results in two distinct and opposing effects. First, it magnifies existing optimism bias between plaintiffs. This increases the scope for disagreement. Second, however, it increases negotiation effort before litigation or trial. When a case is more valuable, insurers increase their investment into discovering the facts of the policyholder's case by consulting police and hospital reports, conducting independent medical examinations, and appraising the extent of property damage. Plaintiffs also have the incentive to increase spending into discovery and independent evaluation. Increases in the costs of prolonging a dispute reduce the likelihood of disagreement by enhancing the settlement zone.[20] The net effect in period t is therefore ambiguous, and the magnitude of any change is an empirical question.

Proposition 2. *Assume the same conditions as in 1. If lower uncertainty reduces the variance of ϵ to $\sigma_{t+1}^{2B} < \sigma_t^{2B}$, then:*

(i) $\frac{Z_t^{Bs}}{Z_t^{B1}} > \frac{Z_{t+1}^{Bs}}{Z_{t+1}^{B1}}$, *where $s \in \{1, 2\}$.*

(ii) *(a)* $(r_s(J_2) - r_s(J_1)) < J^{**} \Rightarrow \frac{Z_{t+1}^{Bs}}{Z_{t+1}^{B1}} > \frac{Z_{t+1}^{As}}{Z_{t+1}^{A1}}$

(b) $(r_s(J_2) - r_s(J_1)) > J^{**} \Rightarrow \frac{Z_{t+1}^{Bs}}{Z_{t+1}^{B1}} < \frac{Z_{t+1}^{As}}{Z_{t+1}^{A1}}$

where J^{**} is a sufficiently large constant.

Proof 2. *See Appendix A.1.2.*

[20] Note that if parties are risk averse, the same argument applies: the likelihood of settlement failure decreases. The magnitude or impact of risk aversion is not tested, but is mentioned in section 4 where pertinent.

Proposition 2 constitutes a comparative dynamic prediction of changes in settlement failure over time, both within tort states and between tort and non-tort states. Part (i) generates an unambiguous prediction of the effect of legal uncertainty on settlement rates. It follows from the fundamental properties through which Priest-Klein specificies subjective probability formation. More uncertainty creates a larger probability of settlement failure by increasing the error with which parties estimate the standard a given case, Y'. Whatever is the permanent level of uncertainty associated with the standard for tort law, the possibility of transitory uncertainty adds to this value in the short-term. This implies that a lower percentage of claims will settle without litigation or trial in state B in the period of regime change than in the period(s) following regime change.

Part (ii) combines the earlier two results to compare settlement rates at period $t + 1$ between states A and B. Unlike (i), a comparison between states depends not only on parties' uncertainty in evaluating potential trial outcomes, but also in their response to the larger stakes of tort trials. Like Proposition 1, response can be characterized by the difference in litigation costs between regimes. Increased litigation costs reduce the probability of settlement failure, while increased effective optimism bias and possibly increased permanent uncertainty raise the probability of settlement failure. If the effect of increased litigation costs is large enough to offset the effects of increased effective optimism bias and permanent uncertainty, then closed claims in state B will have lower levels of settlement failure in the long-term than closed claims in state A. And vice versa if optimism bias and uncertainty dominate litigation spending. The dynamic effect of tort change between states, like the static effect, is therefore also an empirical question.

Before testing the predictions of the Priest-Klein model for auto insurance bad faith, it is worth pausing to assess the implications of asymmetric information models to the same question. These models posit that an uninformed plaintiff makes settlemend demands of an informed defendant. In the auto insurance context, the insurer could expect to have dealt with a range of bad faith disputes or to know whether its actions in negotiation constitute negligent or intentional harm. With respect to tort law's increased stakes, screening models such as Bebchuk (1984) imply that the law increases the policyholder's threat position and therefore his settlement demand. Higher settlement demand requires the marginal insurer to possess a weaker case than otherwise. This unambiguously increases the overall percentage of claims that fail to settle.

Strategic models of signaling add an additional layer of complexity to the standard screening framework by allowing parties to bargain sequentially. One party's decision to make or respond to an offer conveys a signal to the other party, which he uses to update his prior assessment of the other's type. Nalebuff (1987) specifies a two-sided model of asymmetry in which the policyholder makes a settlement demand, the plaintiff accepts or rejects, and the policyholder then chooses whether to proceed to trial. The policyholder is uninformed about the the strength of his case, and the insurer is uninformed about the policyholder's willingness to extend the dispute to its next stage.

In this model, the signal that the policyholder's offer conveys to the insurer creates a "credibility constraint." Because of the double-sided asymmetry, the policyholder must demand a high enough settlement to provide the insurer a credible threat to go to trial. Policyholders raise the value of their demands relative to the non-signaling benchmark. The presence of the credibility constraint can reverse the Bebchuk (1984) prediction. If it binds in equilibrium, then the increased stakes of a tort regime relax the constraint. The policyholder no longer inflates his negotiation position, which *decreases* his settlement demand relative to the non-tort case. This leads the insurer to accept a higher proportion of policyholder offers, and the incidence of settlement failure unambiguously decreases.

Neither the screening nor signaling models specify how uninformed parties form their expectations over their adversary's type. As such, they do not generate testable predictions for how the uncertainty induced by a change to tort law would alter the distribution of insurer types that the policyholder perceives. Likewise, because the magnitude of parties' error is left unspecified, asymmetric information models do not predict comparative dynamics such as those arising from the Priest-Klein model.

3 Data and Descriptive Evidence

3.1 IRC Data

To test the predictions derived in section 2, we employ a repeated cross-sectional dataset of auto insurance claims. Specifically, we use three samples of closed, uninsured motorist (UM) claims from surveys conducted by the Insurance Research Council (IRC).[21] UM is a standard coverage that provides policyholders compensation in the event that they suffer bodily injury in an accident where the other driver is at fault, but that driver does not possess liability insurance. It is consistently interpreted by courts as a type of "first-party" insurance: the policyholder files a claim requesting payment from his insurer for his own loss, rather than for the loss of a "third-party."[22] As Browne, Pryor and Puelz (2004) and Asmat and Tennyson (2014) describe, UM insurance provides ample scope for the policyholder to negotiate damages with his insurer. UM claims are therefore particularly well suited to assessing settlement likelihood.

The first portion of the dataset consists of the complete set of UM claims from IRC surveys in 1977, 1987, and 1997. Approximately 60 different insurers were surveyed during a 2-week interval in the year the survey was administered.[23] It contains claims across 42 different states in the U.S.[24] The dataset contains broad state-level variation in bad faith regimes and time. We treat the state and year in which the accident occurred as the indicator of bad faith regime. To remove heterogeneity in claims that may affect the chances of dispute in ambiguous ways, we drop claims with outlying features. They include all claims for which claimed loss exceeded the insurance policy limit, another insurer contributed part of the settlement, or a no-fault regime mandated a minimum claiming threshold.

The results presented in section 2 depend on claims from both types of states possessing similar distributions and characteristics. The data contains extensive information about the accident, the claim, and the claimant.[25] We exploit in particular information on the date of insurance filing, first payment, and final payment to proxy for the stage of the dispute, s. We construct a measure of "settlement lag" to compare dispute outcomes from claims in different regimes at the same point in their timeline. Settlement lag is defined as the date of final payment from insurer to policyholder less the date of insurance filing.[26] The

[21] The IRC is a nonprofit research organization that has conducted numerous decennial surveys of American insurers since its inception in 1977. It is widely regarded as the leading data provider for economic studies of auto insurance claims.

[22] See Corp. and LLP (2008), described further below. Third-party (a type of "liability") insurance provides coverage to a policyholder for a loss the policyholder brings upon a third-party. Bad faith law treats the two types of insurance differently. Expanding liability for third-party insurance has been less legally contentious than its analog, and states have been quicker to recognize tort liability on third-party claims. See Sykes (1994) for a normative economic analysis of third-party bad faith.

[23] Although the share of the private passenger auto insurance market that these insurers comprised is unavailable, the IRC obtains data from most of the largest providers in the country. For example, Allstate, Farmers, GEICO, Liberty Mutual, Prudential, and State Farm have each participated in at least one of the surveys. The IRC does not survey the same set of insurers each decade, and its data does not identify the particular insurer associated with any claim.

[24] Claims from the following eight states are not represented: Hawaii, Louisiana, Maryland, Massachussetts, Montana, Nebraska, New Jersey, and Pennsylvania.

[25] These variables are described further as they appear in the regression specifications in section 4.

[26] It could also be defined as the date of first payment less the date of insurance filing; the two measures are nearly identical. We use final payment in order to account for disputes which may have developed after the first payment but before subsequent payments of a structured settlement.

model specifies that higher settlement lag is associated with higher proportions of lawsuits and trials. We examine the implications of this variable further in section 3.3.

Each claim contains powerful measures of litigation status that we treat as the primary dependent variables of interest. The first is the presence or absence of a filed lawsuit, and the second is a categorical variable for the stage in which a lawsuit ended. The second measure denotes whether a suit ended before trial, during trial, or with judgment from trial. We render the outcome binary by treating a claim as "tried" if a trial begins, and "settled" otherwise.[27] It also contains a binary variable for attorney use during the negotiation.

3.2 Bad Faith Regime Data

The second portion of our dataset tracks the evolution of state first-party bad faith regimes. The assessment of state bad faith law over time is based on the dataset compiled and described by Tennyson and Warfel (2010). They use the comprehensive legal sources of case law found in Stempel (2006), Ostrager and Newman (2008), and Corp. and LLP (2008) to classify bad regimes through 2008.[28]

The case law data can be used to classify states by several different types of first-party bad faith remedies: recognition of any private cause of action; tort-based cause of action; punitive damages; or extra-contractual damages. By 1997, the final year of the IRC dataset, all but five states explicitly recognized a private right of action for bad faith.[29] Legal scholarship and economic evidence has argued that the most relevant distinction between regimes is not the presence of a private cause of action, but instead the presence or absence of tort liability.[30] Tort liability typically allows plaintiffs to collect sums for economic harm above the policy limits, non-economic harm such as emotional distress, and punitive damages. Our empirical treatment of bad faith law therefore classifies states as either tort or non-tort regimes at each point in time. This measure is substantively equivalent to classificaton by the presence or absence of punitive or extra-contractual damages, and results are robust to each of the three classifications.[31]

[27]Only 8 of the 467 total claims that resulted in lawsuit were settled during trial.

[28]A simplified, cross-sectional version of this timeline was used by Browne, Pryor and Puelz (2004), who analyze auto insurance claims solely from the 1992 IRC survey. The full version was used in Asmat and Tennyson (2014).

[29]The remaining states are Kansas, Maryland, Michigan, Minnesota, Missouri, and New York.

[30]See Asmat and Tennyson (Forthcoming) for a summary of the legal and economic literature on this topic.

[31]Tables of state bad faith laws over time with respect to each of the three remedies are available upon request from the authors.

3.3 The Selection Hypothesis

The observations in each IRC survey arise only from claims closed during the two-week interval of sampling. Figure 2 displays the number of closed accident claims by survey year for each of the three surveys. Most claims were filed in either the year of or the year preceding the survey, with a small tail of claims filed several years prior. This distribution is relatively constant across the three survey years.

[Figure 2 about here.]

State bad faith reform, on the other hand, occurred non-uniformly over the roughly two decades from the early 1970s to the early 1990s. Table B1 depicts the final timeline of state bad faith laws with respect to tort liability. It describes whether and when a state ajudicated bad faith through tort law until 1997, the final year of the IRC dataset. States generally either did not enact the tort remedy at any point in their history, or enacted the remedy and retained it through the sample period. The two exceptions are Florida and Georgia, which removed tort liability for bad faith in 1986 and 1989, respectively. To make the legal classification as consistent as possible, we drop claims from these two states.[32]

The interaction of these two parts of the dataset—the structure of the IRC sample and the history of bad faith reform itself—raises the crucial possibility of selection bias. Any claim in an IRC survey for which the accident occurred on or after the state enacted a bad faith tort regime is treated as a tort claim. All other claims are treated as non-tort claims. Simply through random variation in the timing of legal reforms or the size of state populations, tort claims in the sample may be disproportionately from states that switched to tort law several years before an IRC survey year. If most tort claims in the 1977 IRC sample, for example, are from states that switched regimes in 1971-1973 rather than 1976-1977, then there will be a negative correlation between two variables in the dataset. Specifically, as the year that the state switched to tort law approaches 1977, the settlement lag—the time it took to close the claim—would steadily decrease.

Section 2 specified a framework in which the settlement lag has a strictly deterministic relationship with the stage of the dispute: prolonging the dispute by one stage prolongs the time period by exactly one stage. The model therefore implies that a greater settlement lag increases the probability of settlement failure (to

[32] Estimates with data including claims from these states are available upon request. They do not change the interpretation of any descriptive or regression results.

one, in the limiting case). Moreover, if the year of a state's switch to the tort remedy is negatively correlated with the settlement lag, then it is also negatively correlated with probability of settlement failure. This scenario would generate selection on claims more likely to be have been litigated or tried in tort states. It would result in an upwardly biased estimate of tort law on settlement failure. To the extent that the non-uniformity of regime switches varied from one decade to another—if more states switched to tort law in 1986 and 1987 than in 1976 and 1977, for example—then it would also bias the estimates of regime change over time.

[Figure 3 about here.]

Figure 3 addresses this possibility by plotting the settlement lag against the time since a state switched to tort law, in days. The data is encouraging: there is only mild evidence of a negative correlation between the two variables. Throughout the distribution of settlement lag, there is wide variation in the time since switch. We exploit this variation throughout the empirical analysis by conditioning on the settlement lag of a claim. We also account for the possibility that the settlement lag variable is endogenous with bad faith regime. If tort law shifted the distribution of settlement lags leftward, to decrease the chances of a bad faith allegation, then settlement failures would be upwardly biased even conditional on the lag. In section 4, we instrument for settlement lag with average settlement lag, by state and month, of a different category of auto insurance claims unaffected by first-party bad faith law.

3.4 Empirical Evidence

[Figure 4 about here.]

After dropping claims with missing settlement lags, loss claimed, lawsuit or trial status, as well as all other explanatory variables used in regressions, the dataset contains 5,949 observations. Figure 4 presents a histogram of the remaining observations. It plots each policyholder's claimed economic loss after the accident, by survey year and for the full sample. The data is approximately symmetric with a rightward skew. To preserve the balance of the sample, we treat economic losses above the 99.9^{th} percentile and below the 0.25^{th} percentile as outliers and drop them.[33] Dropping 59 observations above the 99^{th} percentile and 11 observations below the 0.25^{th} percentile results in a final dataset with 5,879 observations.

[Table 1 about here.]

Table 1 presents descriptive statistics of pertinent legal variables for the full sample of claims and the subset of claims in which policyholder filed suit. Several results stand out. Consistent with the model, average settlement time is significantly lower in tort relative to non-tort states throughout the sample. This highlights the importance of conditioning on lag to compare litigation outcomes of tort and non-tort states, which we do throughout the paper.

While claimants from both groups of states hired attorneys at a statistically indistinguishable rate, litigation outcomes display remarkably strong patterns over time.[34] The bottom panel shows that 33% of claims in 1977 tort states for which a lawsuit was filed ended in trial. This figure is orders of magnitude higher than other rates of trial both within claim categories in this dataset and across insurance lines in a variety of settings. By 1997, however, the trial rate conditional on suit declined to less than 3%, significantly lower than its 1997 non-tort counterpart. Similarly, the proportion of claims that reach litigation is significantly higher for tort states than non-tort states in 1987. Like trial rates, it also declined to a level significantly lower than non-tort states by the 1997 survey year. These trends are strongly consistent with both parts of Proposition 2. Part (i) suggests that transitory uncertainty early in bad faith reform increased the variance of parties' error terms with respect to trial outcomes. Part (ii) suggests that the effect of higher litigation spending dominated higher effective optimisim bias once transitory uncertainty subsided, so that raising the stakes increased settllement in auto insurance.

[Figure 5 about here.]

Figure 5 depicts the litigation rates from table 1 graphically and nonparametrically controls for variation at the settlement lag-level. The top panel plots the likelihood of an insurance claim being resolved with litigation, by legal regime and survey year. The bottom panel adds a categorical variable for settlement lag.

[33]Results are robust to the inclusion of these outliers. The six largest losses, all above $50,000, do alter the magnitudes of claimed loss regressions in the 1987 survey year.

[34]The claimant is always the policyholder in this dataset, because all claims are first-party. We use the two terms interchangeably.

This variable divides claims from each survey into four bins, with each bin corresponding to a threshold for settlement lag.[35] Claims from tort and non-tort states are therefore compared at ordered values of settlement lag.

Consistent with the structure of the model, the bottom panel shows clear evidence of data selection by settlement lag: lawsuit proportion rose steadily and markedly as lag increased. Moreover, claims in tort states in the 1977 and 1987 survey years showed higher litigation likelihoods than their counterparts, even after controlling for lag. The effect is particularly strong in the 1987 survey year. The 1997 data, however, shows no evidence of this effect.

[Figure 6 about here.]

Figure 6 displays the corresponding bar graphs for trial rates, among the subset of claims to have reached litigation.[36] Unlike lawsuit rates, trial rates conditional on lawsuit did not demonstrate a clear pattern of increase through settlement lag bin, but rates were consistently lower in the first bin than the second.

The graphs reinforce the statistics tabulated in the bottom panel of table 1: trial rates rose dramatically in the 1977 survey year. The conditional proportion of claims to trial in tort states exceeded that in non-tort states by at least 15 percentage points in each of the four settlement lag bins. Among the set of claims in the second to fourth bins, well over 30% ended in trial—a startlingly high rate in any civil litigation context. The figure is also noteworthy for a second reason.

It may be hypothesized that a large portion of this steadily decreasing pattern of failure rates was attributable to punitive damages reforms and not waning transitory uncertainty. The history of bad faith law, and civil liability more generally, has seen punitive damage reforms and common law evolution gradually restricting the damages enforcable through tort law. The stakes of tort cases may gradually have been converging to those of contract cases throughout the sample period.

Figure 6 highlights that optimism bias alone cannot explain the trend, however. The reason is that claims from tort states were significantly *less* likely to go to trial or face litigation by the end of the sample, when

[35] Thresholds for the four bins shown in the figure are 300 days, 450 days, and 600 days, respectively. These values were chosen to highlight variation in the dependent variable; thresholds that correspond to 25% of claims in each bin in each survey year produce similar results.

[36] Thresholds for the four bins are 400, 600, and 900 days, respectively. They are greater than the thresholds in fig. 5 because the subset of litigated claims has higher average lags than the dataset at large.

conditional trial rates dropped under 3%. If optimism bias were solely responsible for reducing the high trial rates of the 1977 survey year, then trial rates in tort rates should be expected to remain at or above those of non-tort states.[37] Instead, this result is consistent with increased litigation spending dominating the impact of optimism bias on net.[38] This effect is only clear in the long-term, when transitory uncertainty had made way for permanent uncertainty.[39] We develop this intuition further in the next section by formulating a full regression specification that controls for punitive damages limits using state-level data.

[Table 2 about here.]

Finally, we describe other characteristics of litigated claims to show further evidence consistent with the model. Table 2 presents descriptive statistics for the subset of cases in which the policyholder filed suit against his insurer, by bad faith regime and survey year. The upper half of the table shows that the claims selected for litigation were different along several dimensions in tort states in the early part of the sample. Claimants who filed suit in 1977 claimed significantly lower economic losses, were significantly less likely to have visited a hospital, and were significantly more likely to have claimed a strain injury than their counterparts in non-tort states.[40] Each of these variables has a clear interepretation for the negotiation of auto insurance claims. Greater claimed losses and injuries require larger payouts from the insurer to settle, on average. Strain injuries are particularly contentious in the insurance setting due to their difficulty in verifiability, and insurers often pursue additional investigation to gauge the extent of the injury.[41]

Furthermore, the table shows that the mean values of these variables in tort states gradually shifted toward equivalence with other states over the course of the sample. By 1997, all three variables are statistically indistinguishable between the two sets of states. The two findings are consistent with the selection mechanism posited by the Priest-Klein model. As the variance in subjective probabilty estimates between the two parties increased in the 1970s, the selection of cases that failed to settle also changed. These cases were not a random sample of the underlying claims filed: they were cases systematically closer than average

[37] Furthermore, there are additional damages above the insurance policy's limits that states do not restrict through statute.

[38] Risk aversion is not modeled explicitly, but it could also function identically to increased litigation costs.

[39] As appendix A.1.2 shows, the possibility of tort states possessing lower permanent levels of uncertainty than other states could also produce this effect. It is unlikely, however, because of the well-known complexities in assessing the defendant's level of negligence or intentional harm, as well as his degree of deliberation.

[40] Note that claimants filed significantly lower economic losses, on average, in tort states throughout the sample. Section 4 explores this point further.

[41] See Dionne and St-Michel (1991).

to the break-even point of the decision standard.[42] Moreover, as the variance in probability estimates decreased over time, the distribution of cases for litigation changed along with it. Sample means of all three variables in tort states steadily converged to the sample means of their counterparts in the 1987 and 1997 survey years.

4 Econometric Analysis

4.1 Settlement Failure Likelihood

In this section, we test the model's predictions of settlement failure with a sequence of discrete choice regressions. Regression estimation allows us to test a more complete set of predictions from the Priest-Klein model, and to obtain estimated coefficients of the percentage change in settlement failure for claims in the dataset at different sample points. We implement probit regressions of the form:

$$Y_{ilt} = \beta_1 Tort_{lt} + \beta_2 Z_t + \beta_3 Tort_{lt} \times Z_t + \alpha_4 W_{lt} + \alpha_5 X_{ilt} + \epsilon_{ilt} \tag{4}$$

Y_{ilt} is defined in two ways, depending on the stage of settlement failure being estimated. The first is whether the claim closed in a lawsuit, and the second is whether the claim closed with trial, among the subset of cases to have filed a lawsuit. The claim is indexed by i, the accident state by l, and the accident year by t. $Tort_{ilt}$ is coded as one if the state permitted tort law for bad faith in the accident year, and zero otherwise.[43] β_2 captures the changes in parties' settlement behavior attributable to legal uncertainty. Its parameter, Z_t, takes on different values for different regression specifications, as described below. The interaction $Tort_{ilt} \times Z_t$ is the key explanatory variable of interest. β_3 estimates the differential effect of tort law at various points in time.

Identification of β_1, β_2, and β_3 relies on the assumptions outlined in section 2. The model restricts the likelihood of settlement failure at stage one or two to be equal across states, at every time period, conditional on bad faith regime. Specifically, it posits that the position of a claim with respect to the decision standard,

[42] They were not a selected sample in all case dimensions, however. The bottom half of the table shows that litigated claims were statistically indistinguishable in age, employment status, and accident location throughout the sample.

[43] We assume that the dates from table B1 apply to January 1 of the accident year. Results are invariant to the date chosen.

Y, is equal across regimes. It also assumes that the variance of the error term associated with parties' estimates of Y' is equal within a regime.[44]

These identification assumptions are addressed by conditioning on additional claimant- and accident-level characteristics with the vector X_{ist}. Claim characteristics include the economic loss claimed, final settlement amount, specified injuries and their severity.[45] Accident information includes the presence of hospital stay and duration of any visit (categorical variables for emergency room, overnight, one week, or longer), the size of the city or town in which the accident occurred, and the number of vehicles involved in the accident. Demographic variables include age, gender, marital and employment status.[46]

Identification also requires controlling for ways in which states differ in legal policies other than the bad faith regime. W_{lt} contains two binary variables for state-level laws, punitive damages caps and prejudgment interest, that also constitute deeper tests of the model.[47] Punitive damages caps decrease the stakes of a case by eliminating the possibility of large, outsized judgments, and prejudgment interest increases them by raising the amount owed to a victorious plaintiff.

It is important to account for the possibility that settlement lag is endogenous in the estimation of eq. (4). This occurs if tort liability for bad faith induces insurers to speed their negotiation with policyholders in tort states in order to minimize the possibility of litigation. It is instrumented with the average settlement lag in the accident state and year among claims from a parallel IRC dataset on Bodily Injuries. Bodily Injury auto claims are filed against the at-fault driver in accident, rendering them subject to third-party (rather than first-party) bad faith liability. Lags in Bodily Injury claims capture the institutional elements of delay and are correlated with lags from the UM dataset. We assume that this variable is uncorrelated with the error term, ϵ_{ilt}, conditional on the remaining covariates.

[Table 3 about here.]

Table 3 presents the estimation of eq. (4) with lawsuit as the dependent variable. In specifications (1)-(3), indicator variables for the 1987 and 1997 survey years act as the time vector Z_t. Specification (2), which

[44] The variance is not restricted to be constant across time unless it is correlated with bad faith regime. Such changes are picked up through the national-level trend in settlement failure.

[45] The amount of final settlement is also included, but does not distinguish between the insurer's final offer and the final judgment amount in case of trial. See Asmat and Tennyson (2014) for an analysis of bad faith liabilty on settlement amounts.

[46] As described in Section 3.1, we also preemptively dropped claims for which claimed loss exceeded the insurance policy limit, another insurer contributed part of the settlement, or a no-fault regime mandated a minimum claiming threshold.

[47] The data listing these reforms by state were obtained from the Insurance Information Institute.

adds the full set of explanatory variables, explains substaintially more of the variation in lawsuits than the specification (1). Specification (3) instruments settlement lag with state- and time-level lags from Bodily Injury claims. It captures more variation in the dependent variable otherwise attributed to the time trend.

The primary coefficients of interest hold the expected sign through most specifications: positive in the 1977 and 1987 years, and negative in the 1997 year. The importance of conditioning by (instrumented) settlement lag is evidenced by the fact that it raises lawsuit probability in the 1977 survey year above zero.[48] Specification (3) indicates that a claim with average characteristics in 1987 was nearly 10% more likely to be litigated if it was in a bad faith tort state than otherwise.

Coefficients on punitive damages caps and prejudgment interest enter negatively and positively, respectively. While neither of these coefficients reaches significance, the signs are consistent with punitive damages causing a small portion of the decline in lawsuit rates in bad faith tort states over time. Both estimates are consistent with the presence of optimism bias, the fundamental property of divergent expectations models.[49]

Note also that settlement lag carries a positive and significant coefficient in specifications (2) and (3). These results are consistent with the Bebchuk (1984) screening model: higher claimed losses are associated with higher likelihoods of filing suit. Unreported specifications with claimed loss regressed on the same covariates indicate that claimed losses were also related non-monotonically to tort liability over the sample period. These results are illustrated in fig. B3, which plots the mean total loss claimed for the two groups of states in the three survey years. The results suggest that higher claimed losses in 1987 were associated with higher litigation rates in that survey year, and that relatvely lower claimed losses in 1998 were associated with decreased liltigation rates in that survey year. To the extent that claimed loss is endogenous in table 3, specifications (2) and (3) overstate its positive effect on lawsuit likelihood and understate the time trends, which nonetheless remain strongly significant.[50]

[Table 4 about here.]

[48] Unreported regressions also show the same sign when attorney use is included as an endogeneous regressor in 2SLS estimation. It is instrumented with a measure of the legal employees in the accident state and year. This data was compiled from the "legal services" 4-digit SIC code in the County Business Patterns series from the U.S. Census Bureau.

[49] While the magnitudes of these coefficients vary based on the point at which the marginal effect is evaluated, the sign does not. Sample means for punitive damage caps and prejudgment interest are 11% and 41% across the sample, respectively.

[50] The next version of this draft will instrument for loss claimed in these two speecifications.

Table 4 presents the analagous marginal effect estimates for trial likelihood. The dataset is made up of claims from the subset of claims for which a suit was filed. Intereacted coefficients are again consistent with increased settlement failure followed by rapidly reduced failure rates by the end of the sample.[51] A claimed strain injury enters positively and significantly. Loss claimed, punitive damages caps, and prejudgment interest are not statistically significant predictors.

The endogeneous settlement lag specification (3) is noteworthy in producing marginal effects much closer to those suggested by the descriptive bar graphs in section 3.4.[52] They indicate that tort liability raised the conditional estimate of a litigated claim ending in trial by a remarkable 20% at the sample mean of the explanatory variables in the 1977 survey year. This estimate declined rapidly in the 1987 and 1997 survey years, dropping *below* -20% in 1997. The large magnitude of these estimates is striking.

[Table 5 about here.]

To gain a deeper understanding of which states drive the trends described above, we decompose the tort indicator variable based on when states switched to a tort regime. Specification (1) in table 5 treats a claim as belonging to the tort regime "by" a given survey year if the claim arose from a state that enacted tort law on or before that survey year. The 1977 indicator variable, for example, tags only claims from those states that enacted the tort remedy by the 1977 survey year. The 1987 indicator variable tags claims from those states, in addition to claims from states switched betwen 1977 and 1987, but not claims from states that switched after 1987 but before 1997.

Specification (2) decomposes tort reform further. It treats a claim as belonging to the tort regime "in" a survey year only if it is from a state that enacted tort law by that survey year *and* after the end of the previous survey year. The "in" 1987 indicator variable, for example, is active only for claims from states that switched by 1987 and after 1977. The next group of variables interacts these indicators with survey year dummys for subsequent years. The coefficient on the "Tort in 1987 × I(97)" can be interepreted as the effect of tort law on lawsuit probability in 1997 among the second group of states to switch to tort law.

[51] The time trends alone also capture a significant amount of the variation in trial rates; specification (1) has a Psuedo-R^2 of over 11%.

[52] The Wald statistic testing for the exogeneity of settlement lag, however, fails to be rejected ($Pr > \chi^2 = 0.44$).

Both specifications in table 5 show that the time trends in lawsuit and trial rates were driven by the first states to switch to tort law: those that enacted reform by 1977. The coefficient for the 1977 tort indicator variable in specification (4) implies that those states raised the conditional likelihood of a trial by 21.7% in the 1977 survey year, but reduced the likelihood by 4.3% and 3.0% in the 1987 and 1997 survey years, respectively. There was no corresponding increase in trial rates for the next group of states to pass the tort remedy, the 1987 group: rates continued to decline among those states as they changed regimes Figure B2 reinforces these results graphically. It shows that the increases in trial rates among tort states in 1977 were not replicated among those states switching to tort between 1977 and 1987, or between 1987 and 1997.

These findings are also consistent with the evolution of bad faith law on a national level. As Tennyson and Warfel (2010) detail, common law in California and Wisconsin formed two noteworthy and distinct standards for first-party bad faith law 1973 and 1978, respectively. Abraham (1994) relates the consensus among legal scholars of the time that liability for bad faith was expected to continue to expand. In fact, however, California and Wisconsin would establish the two primary models of tort law for other states to follow.[53] The 1970s constituted a more fragile time in the development of common law—and therefore to parties' perceived uncertainty regarding liability—than future years would. Figure B4 shows that the conditional trial trend is fully robust to removing California from the sample, denoting only other states to pass the tort remedy as treated states.[54]

5 Conclusion

This paper has exploited state- and time-level variation in the adjudication of tort law for bad faith insurance law to show evidence consistent with the Priest-Klein model. Data from IRC samples in 1977, 1987, and 1997 shows strongly positive and significant effects of tort liability on settlemetn failure rates up to 20% in the short-term, and similarly negative effects in the long-term. The evidence is consistent with the tort regime increasing the variance of parties' subjective trial estimates and increasing the scope for disagreement in the short-term. It is also consistent with one of the predictions of asymmetric information models of settlement:

[53]See Asmat and Tennyson (Forthcoming) for further discussion.

[54]The sample size of litigated and tried claims drops significantly after removing California, particularly in the 1977 survey year (where fewer states adjudicated bad faith through tort). The next version of this draft will update the dataset to add UIM and other types of claims to the sample, increasing size and geographical variation.

policyholder settlement demands were positively correlated with lawsuit probability throughout the sample period.

Although the data cannot isolate the effect of optimism bias specifically, it is likely that a portion of the stark short-term increase in settlement failure was also attributable to the possibility of increasingly large stakes. The 1970s and 1980s saw a national surge in large, multimillion judgments for plaintiffs across civil liability cases. In the subsequent years, states passed numerous reforms to limit the payouts for general and punitive damages, noneconomic damages, and prejudgment interest. Estimates of punitive damages caps and prejudgment interest policies are consistent with optimism bias explaining a portion of the time trend in settlement failure, but they do not come close to explaining all of the variation.

There are also specific factors in the evolution of first-party bad faith insurance law that may have made the magnitude of results presented in this paper especially large. First, there has been debate about the intent and scope implied by the standard that a majority of tort states have imposed. The standard, based on a 1978 Wisconsin Supreme Court case, is understood to lie between the traditionally clear intentional and negligence benchmarks.[55] As Sykes (1996) explains:

> Despite the efforts of the *Anderson* court to define bad faith breach as an "intentional" tort, even a superficial reading of the opinion reveals elements of a negligence standard...The court and perhaps the jury must make some judgment about the objective "reasonableness" of the insurer's actions.

In practice, it is fairly clear that the general trend of this interpretation was to raise the standard required to show bad faith. Abraham (1994) notes that state courts made a point to limit punitive damages following the early years of bad faith tort remedies in the 1970s. Feinman (2012) argues based on more recent cases that bad faith liability has continued to narrow. All of these factors are consistent wtih the decreasing litigation probability trends shown in this paper. Further research is needed to disentangle their impact from those of tort law more generally. This is especially important with respect to the largest policy finding of this paper: that claims from bad faith tort regimes were less likely than claims from their counterparts to face lawsuit or trial by the end of the sample period.

[55] *Anderson v. Continental Insurance Co.*, 85 Wis. 2d 675, 271 N.W. 2d 368 (1978).

Notwithstanding these particular features in the history of bad faith law, however, this paper has highlighted the importance of a central element of the Priest-Klein model. Because Priest-Klein formulates plaintiff and defendant trial expectations relative to a decision standard, it places first-order emphasis on the variance in parties' expectation of a decision standard. The model is thus well-suited to predicting the effect of the inherent uncertainty that arises when a new legal right is introduced. The tort remedy for bad faith is hardly unique in this regard: practically all changes in substantive law are accompanied by some change in standard. When evaluating comparative statics of a legal change, it is therefore critical to take into account the uncertainty that both parties in pre-trial negotiation perceive. This point is not fully captured by asymmetric information models of settlement.

References

Abraham, Kenneth S. 1994. "Natural History of the Insurer's Liability for Bad Faith." *Texas Law Review*, 72: 1295–1316.

Asmat, Danial, and Sharon Tennyson. 2014. "Does the Threat of Insurer Liability for "Bad Faith" Affect Insurance Settlements." *The Journal of Risk and Insurance*, 81(1): 1–26.

Asmat, Danial, and Sharon Tennyson. Forthcoming. "The Law and Economics of Insurance Bad Faith Liability." In *Research Handbook on the Economics of Insurance Law.* , ed. Daniel Schwarcz and Peter Siegelman. Elgar Publishing.

Bebchuk, Lucian A. 1984. "Litigation and Settlement Under Imperfect Information." *Bell Journal of Economics*, 15(3): 404–415.

Browne, Mark J., and Joan T. Schmit. 2008. "Litigation Patterns in Automobile Bodily Injury Claims 1977-1997: Effects of Time and Tort Reforms." *The Journal of Risk and Insurance*, 75(1): 83–100.

Browne, Mark J., Ellen S. Pryor, and Bob Puelz. 2004. "The Effect of Bad-Faith Laws on First-Party Insurance Claims Decisions." *The Journal of Legal Studies*, 33(2): 355–390.

Corp., General Reinsurance, and Edward Angell Palmer & Dodge LLP. 2008. "Bad Faith Laws for Property/Casualty Claims."

Danzon, Patricia, and Lee A. Lillard. 1983. "Settlement out of Court: The Disposition of Medical Malpractice Claims." *The Journal of Legal Studies*, 12(2): 345–377.

Dionne, Georges, and Pierre St-Michel. 1991. "Worker's Compensation and Moral Hazard." *The Review of Economic Studies*, 73(2): 236–244.

Eaton, Thomas A., David B. Mustard, and Susette M. Talarico. 2005. "The Effects of Seeking Punitive Damages on the Processing of Tort Claims." *Journal of Legal Studies*, 34(2): 343–369.

Eisenberg, Theodore, and Henry Farber. 2003. "The Government as Litigant: Further Tests of the Case Selection Model." *American Law and Economics Review*, 5(1): 94–133.

Farber, Henry S., and Michelle J. White. 1991. "Medical Malpractice: An Empirical Examination of the Litigation Process." *Rand Journal of Economics*, 22(2): 199–217.

Farber, Henry S., and Michelle J. White. 1994. "A Comparison of Formal and Informal Dispute Resolution in Medical Malpractice." *Journal of Legal Studies*, 23(2): 777–806.

Feinman, Jay M. 2012. "The Law of Insurance Claim Practices: Beyond Bad Faith." *Insurance Practice Law Journal*, 47: 693–740.

Fournier, Gary M., and Thomas W. Zuehlke. 1989. "Litigation and Settlement: An Empirical Approach." *The Review of Economics and Statistics*, 71(2): 189–195.

Gould, John P. 1973. "The Economics of Legal Conflicts." *The Journal of Legal Studies*, 2(2): 279–300.

Hughes, James W., and Edward A. Snyder. 1989. "Policy Analysis of Medical Malpractice Reforms: What Can we Learn from Claims Data?" *Journal of Business & Economic Statistics*, 7(4): 423–431.

Hughes, James W., and Edward A. Snyder. 1995. "Litigation and Settlement under the English and American Rules: Theory and Evidence." *Journal of Law and Economics*, 38(1): 225–250.

Johnston, Jason Scott, and Joel Waldfogel. 2002. "Does Repeat Play Elicit Cooperation? Evidence From Federal Civil Litigation." *The Journal of Legal Studies*, 31(1): 39–60.

Katz, Avery. 1990. "The Effect of Frivolous Lawsuits on the Settlement of Litigation." *International Review of Law and Economics*, 10(1): 3–27.

Kessler, Daniel. 1996. "Institutional Causes of Delay in the Settlement of Legal Disputes." *Journal of Law, Economics, and Organization*, 12(2): 432–460.

Kessler, Daniel P., and Daniel L. Rubinfeld. 2007. "Empirical Study of the Civil Justice System." In *Handbook of Law and Economics*. Vol. 1, , ed. A. Mitchell Polinsky and Steven Shavell, 343–402. Elsevier: North-Holland.

Kessler, Daniel, Thomas Meites, and Geoffrey Miller. 1996. "Explnaining Deviations from the Fifty-Percent Rule: A Multimodal Approach to the Selection of Cases for Litigation." *The Journal of Legal Studies*, 25(1): 233–259.

Landes, William M. 1971. "An Economic Analysis of the Courts." *Journal of Law and Economics*, 14(1): 61–107.

Landes, William M., and Richard A. Posner. 1979. "An Economic Approach to Legal Procedure and Judicial Administration." *The Journal of Legal Studies*, 8(2): 235–284.

Nalebuff, Barry. 1987. "Credible Pre-trial Negotiation." *The Rand Journal of Economics*, 18(2): 198–210.

Ostrager, Barry R., and Thomas R. Newman. 2008. *Handbook on Insurance Coverage Disputes.* Vol. 2. Fourteenth ed., New York: Aspen Publishers.

Perloff, Jeffrey M., Daniel L. Rubinfeld, and Paul Ruud. 1996. "Antitrust Settlements and Trial Outcomes." *Review of Economics and Statistics*, 78(3): 401–409.

P'ng, Ivan P. 1983. "Strategic Behavior in Suit, Settlement and Trial." *Bell Journal of Economics*, 14(2): 539–550.

Posner, Richard A. 1973. "An Economic Approach to Legal Procedure and Judicial Administration." *The Journal of Legal Studies*, 2(2): 399–458.

Prescott, J.J., and Kathryn E. Spier. 2015*a*. "A Comprehensive Theory of Civil Settlement." Working Paper.

Prescott, J.J., and Kathryn E. Spier. 2015*b*. "Tailored Suits: Contracting on Litigation." Working Paper.

Prescott, J.J., Kathryn E. Spier, and Albert Yoon. 2014. "Trial and Settlement: A Study of High-Low Agreements." *Journal of Law and Economics*, 57(3): 699–746.

Priest, George L. 1987. "Measuring Legal Change." *Journal of Law, Economics, & Organization*, 3(2): 193–225.

Priest, George L., and Benjamin Klein. 1984. "The Selection of Disputes for Litigation." *The Journal of Legal Studies*, 13(1): 1–55.

Reinganum, Jennifer F., and Louise L. Wilde. 1986. "Settlement, Litigation, and the Allocation of Litigation Costs." *The Rand Journal of Economics*, 17(4): 557–566.

Shavell, Steven. 1982. "Suit, Settlement and Trial: A Theoretical Analysis under Alternative Methods for the Allocation of Legal Costs." *The Journal of Legal Studies*, 11(1): 55–82.

Siegelman, Peter, and Joel Waldfogel. 1999. "Toward a Taxonomy of Disputes: New Evidence through the Prism of the Priest/Klein Model." *The Journal of Legal Studies*, 28(1): 101–130.

Siegelman, Peter, and John J. Donohue. 1995. "The Selection of Employment Discrimination Disputes for Litigation: Using Business Cycle Effects to Test the Priest-Klein Hypothesis." *The Journal of Legal Studies*, 24(2): 427–462.

Spier, Katherine. 2007. "Litigation." In *Handbook of Law and Economics.* Vol. 1, , ed. A. Mitchell Polinsky and Steven Shavell, 259–342. Elsevier: North-Holland.

Spier, Kathryn E. 1992. "The Dynamics of Pretrial Negotiation." *Review of Economics Studies*, 59(1): 93–108.

Stempel, Jeffrey W. 2006. *Stempel on Insurance Contracts.* . Third ed., New York: Aspen Publishers.

Sykes, Alan O. 1994. "Judicial Limitations on the Discretion of Liability Insurers to Settle or Litigate: An Economic Critique." *Texas Law Review*, 72: 1345–1374.

Sykes, Alan O. 1996. "'Bad Faith' Breach of Contract by First-Party Insurers." *The Journal of Legal Studies*, 25(2): 405–433.

Tennyson, Sharon, and William J. Warfel. 2010. "The Law and Economics of First-Party Insurance Bad Faith Liability." *Connecticut Insurance Law Journal*, 16(1): 203–242.

Viscusi, W. Kip. 1988. "Product Liability Litigation with Risk Aversion." *The Journal of Legal Studies*, 17(1): 101–121.

Waldfogel, Joel. 1995. "The Selection Hypothesis and the Relationship between Trial and Plaintiff Victory." *The Journal of Political Economy*, 103(2): 229–260.

Waldfogel, Joel. 1998. "Reconciling Asymmetric Information and Divergent Expectations Theories of Litigation." *Journal of Law and Economics*, 41(2): 451–476.

Table 1: Settlement Statistics by Legal Regime and Survey Year

	1977			1987			1997		
	Tort	Non-Tort		Tort	Non-Tort		Tort	Non-Tort	
Mean Settlement Lag	211	267	***	242	294	***	280	350	***
	(8.4)	(10.5)		(7.0)	(15.9)		(6.5)	(17.2)	
Proportion Attorney Rep.	0.405	0.427		0.511	0.506		0.445	0.453	
	(0.019)	(0.015)		(0.014)	(0.022)		(0.011)	(0.023)	
Proportion Litigated	0.102	0.114		0.114	0.056	***	0.059	0.093	***
	(0.012)	(0.010)		(0.010)	(0.010)		(0.005)	(0.013)	
N	684	1023		1,216	532		1,943	481	
Proportion Tried | Litigated	0.329	0.077	***	0.072	0.167	*	0.027	0.133	***
	(0.057)	(0.026)		(0.022)	(0.069)		(0.015)	(0.051)	
N	70	117		139	30		113	45	

***$p < 0.01$, **$p < 0.05$, *$p < 0.1$. All values are sample means, with parantheses denoting standard errors. "Loss Claimed" represents the economic losses claimed by the policyholder following accident.

Table 2: Descriptive Statistics of Litigated Claims
by Legal Regime and Survey Year

	1977			1987			1997	
	Tort	Non-Tort		Tort	Non-Tort		Tort	Non-Tort
Loss Claimed ($)	3,375	4,823		4,357	5,471		5,800	6,059
	(480)	(579)		(443)	(1,376)		(643)	(1,098)
Hospital Stay†	0.414	0.632	***	0.475	0.667	*	0.575	0.689
	(0.059)	(0.045)		(0.043)	(0.088)		(0.047)	(0.070)
Strain Claimed†	0.871	0.692	***	0.863	0.667	***	0.717	0.667
	(0.040)	(0.043)		(0.029)	(0.088)		(0.043)	(0.071)
Age	34.5	28.9	**	33.2	37.0		36.6	32.9
	(2.1)	(1.5)		(1.3)	(3.0)		(1.5)	(2.0)
Employed Full-time †	0.343	0.342		0.496	0.567		0.451	0.511
	(0.044)	(0.057)		0.042	(0.092)		(0.047)	(0.075)
Urban Accident†	0.671	0.718		0.583	0.700		0.584	0.689
	(0.057)	(0.042)		(0.041)	(0.085)		(0.047)	(0.070)
N	70	117		139	30		113	45

***$p < 0.01$, **$p < 0.05$, *$p < 0.1$. All values are sample means, with parantheses denoting standard errors. "Loss Claimed" represents the economic losses claimed by the policyholder following accident. All values are in CPI-indexed 1987 US dollars.
† Indicator variable equal to one if condition satisfied and zero otherwise.
Hospital stay equals one if claimant visited ER, overnight, one week, or more than one week.
Strain claimed equals one if claimant reported a neck, back, or other strain.
Employment status equals one if claimant was employed full-time at time of accident, and zero if claimant identified as part-time, student, unemployed, minor, or retiree.
Urban accident equals one if claimant identified accident location as "big city" or "medium city," and zero if identified as "suburban" or "small town."

Table 3: Probit Regression of Lawsuit Indicator
on Tort Liability and Covariates, 1977-1997

	(1)	(2)	(3)†
I(Tort)	-0.010	-0.012	0.005
	(0.013)	(0.011)	(0.011)
I(87)	-0.059***	-0.060***	-0.060
	(0.016)	(0.014)	(0.014)
I(97)	-0.017	-0.028**	-0.037***
	(0.015)	(0.013)	(0.014)
I(Tort) × I(87)	0.069***	0..054***	0.046**
	(0.020)	(0.018)	(0.018)
I(Tort) × I(97)	-0.029	-0.021	-0.027
	(0.019)	(0.017)	(0.017)
Ln Settlement Lag			0.056***
			(0.013)
Ln Loss Claimed		0.040***	0.030***
		(0.003)	(0.011)
Pun Dam Cap		-0.017	-0.006
		(0.012)	(0.013)
Prejmt Interest		0.013	0.013
		(0.009)	(0.009)
N	5,879	5,879	5,879
Psuedo R^2	0.015	0.120	

***$p < 0.01$, **$p < 0.05$, *$p < 0.1$. All coefficients are marginal effects calculated at the sample mean of the explanatory variable. All regressions are estimated by MLE.
The dependent variable is equal to one if the claim settled with a lawsuit filed, and zero otherwise. I(87) and I(97) equal one if the claim is from the 1987 and 1997 survey year, respectively. Loss Claimed represents the economic losses claimed by the policyholder following accident. All values are in CPI-indexed 1987 US dollars. Other controls not shown denote employment status, sex, marital status, accident location, injury measures.
† Instruments the natural log of settlement lag with the average natural log of settlement lag for BI claims in the state and year of the accident.

Table 4: Probit Regression of Trial Indicator
on Tort Liability and Covariates, 1977-1997

	(1)	(2)	(3)†
I(Tort)	0.156***	0.129***	0.215**
	(0.038)	(0.037)	(0.086)
I(87)	0.073	0.044	0.030
	(0.051)	(0.048)	(0.062)
I(97)	0.050	0.034	0..016
	(0.046)	(0.047)	(0..067)
I(Tort) × I(87)	-0.234***	-0.224***	-0.270**
	(0.063)	(0.073)	(0.091)
I(Tort) × I(97)	-0.286***	-0.273***	-0.356***
	(0.063)	(0.066)	(0.092)
Ln Settlement Lag			0.161
			(0.175)
Ln Loss Claimed		0.030**	0.015
		(0.012)	(0.026)
Strain Claimed		0.074*	0.107**
		(0.038)	(0.052)
Pun Dam Cap		0.004	0.025
		(0.061)	(0.082)
Prejmt Interest		0.020	-0.004
		(0.044)	(0 .061)
N	512	512	512
Psuedo R^2	0.113	0.167	

***$p < 0.01$, **$p < 0.05$, *$p < 0.1$. All coefficients are marginal effects calculated at the sample mean of the explanatory variable. All regressions are estimated by MLE.
The dependent variable is equal to one if the claim settled with a trial, and zero otherwise. I(87) and I(97) equal one if the claim is from the 1987 and 1997 survey year, respectively. Loss Claimed represents the economic losses claimed by the policyholder following accident. All values are in CPI-indexed 1987 US dollars. Other controls not shown denote employment status, sex, and marital status, accident location, and other injures.
† Instruments the natural log of settlement lag with the average natural log of settlement lag for BI claims in the state and year of the accident.

Table 5: Probit Regressions of Lawsuit or Trial
on Tort Liability, Time and Covariates, 1977-1997

	Y_{ilt}=Suit		Y_{ilt}=Trial | Suit	
	(1)	(2)	(1)	(2)
I(87)	-0.018***	-0.034***	-0.096***	.003
	(0.004)	(0.006)	(0.024)	(0.053)
I(97)	-0.020***	-0.009	-0.083	-0.004
	(0.005)	(0.006)	(0.027)	(0.040)
I(Tort *by* 77)	0.008*		0.055**	
	(0.005)		(0.027)	
I(Tort *by* 87)	-0.007*		-0.057**	
	(0.005)		(0.027)	
I(Tort *by* 97)	0.006		-0.046	
	(0.013)		(0.125)	
I(Tort *in* 77)		0.001		0.217***
		(0.007)		(0.072)
I(Tort *in* 87)		0.012		-0.045
		(0.023)		(0.030)
I(Tort *in* 97)‡		-0.005		-0.019
		(0.009)		(0.053)
I(Tort *in* 77) × I(87)†		0.070**		-0.043
		(0.035)		(0.034)
I(Tort *in* 77) × I(97)†		-0.006		-0.030
		(0.009)		(0.031)
I(Tort *in* 87) × I(97)‡		-0.014*		-0.073***
		(0.008)		(0.015)
N	5,879	5,879	512	512

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. All coefficients are marginal effects calculated at the sample mean of the explanatory variable. All specifications instrument the natural log of settlement lag with the average natural log of settlement lag for BI claims in the state and year of the accident, and estimate by MLE.
The dependent variable is equal to one if the claim settled with a lawsuit filed, and zero otherwise. Other controls not shown denote loss claimed, (instrumented) settlement lag, employment status, sex, marital status, accident location, injury measures, punitive damage limits, and prejudgment interest.
† denotes Wald test between coefficients in specification (2) rejected for equality at 1% level.
‡ denotes Wald test between coefficients in specification (4) rejected for equality at 10% level.

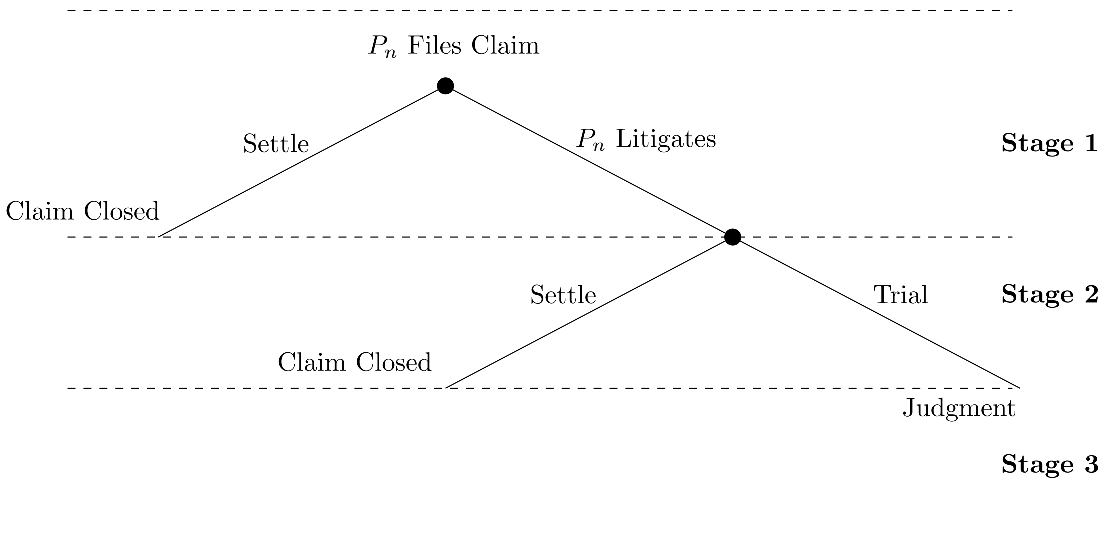


Figure 1: The bargaining process

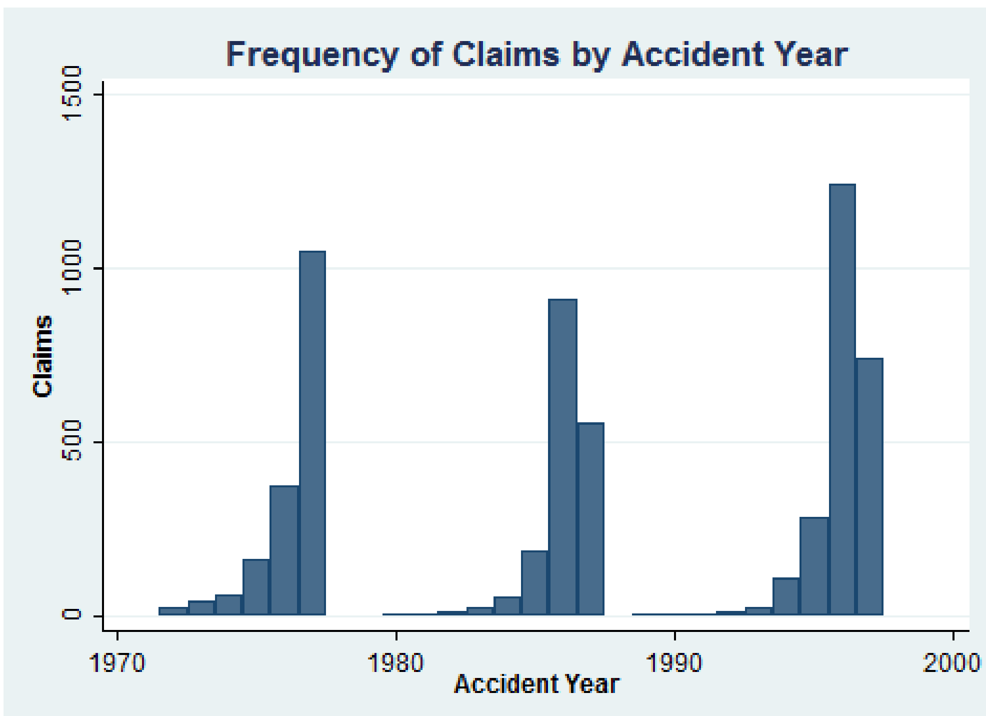


Figure 2: Frequency of Claims by Accident Year

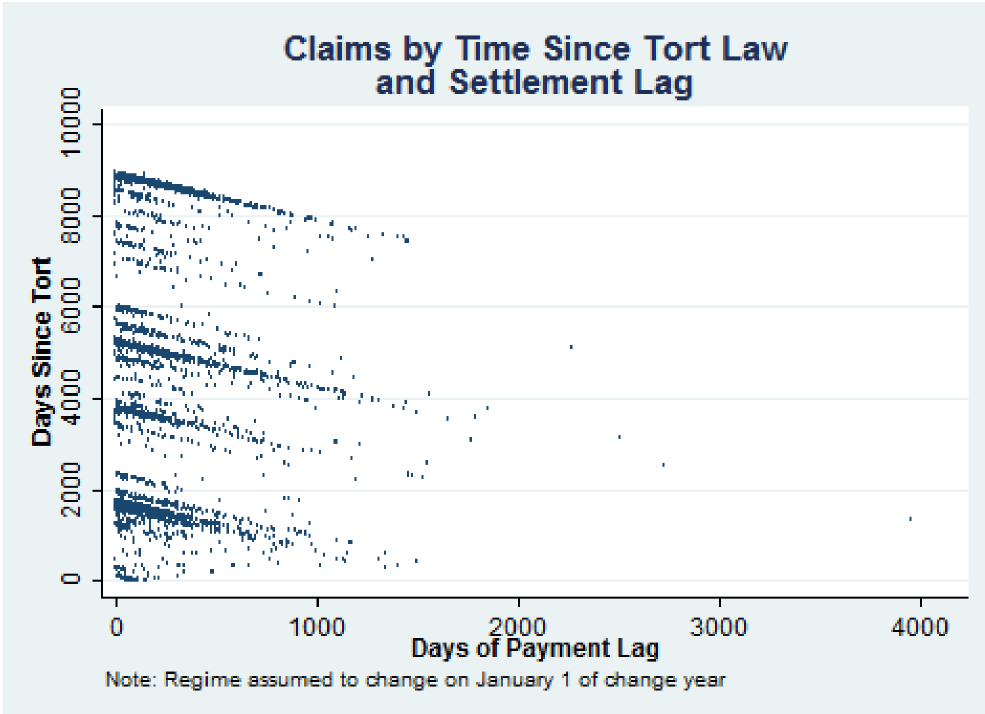


Figure 3: Scatterplot: Claims by Regime Switch and Payment Lag

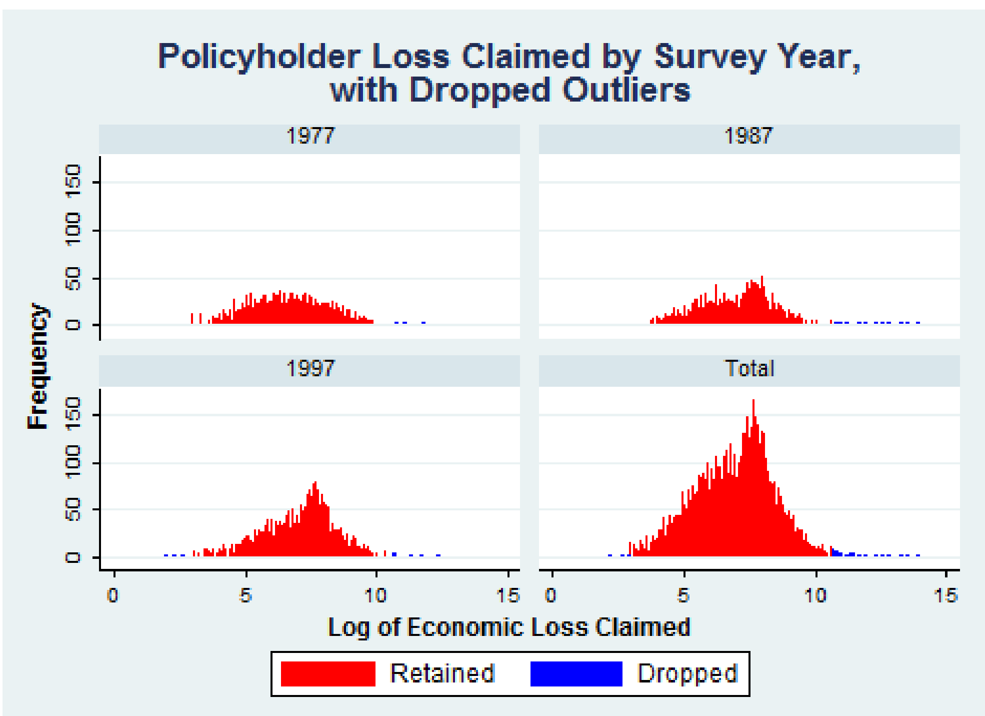
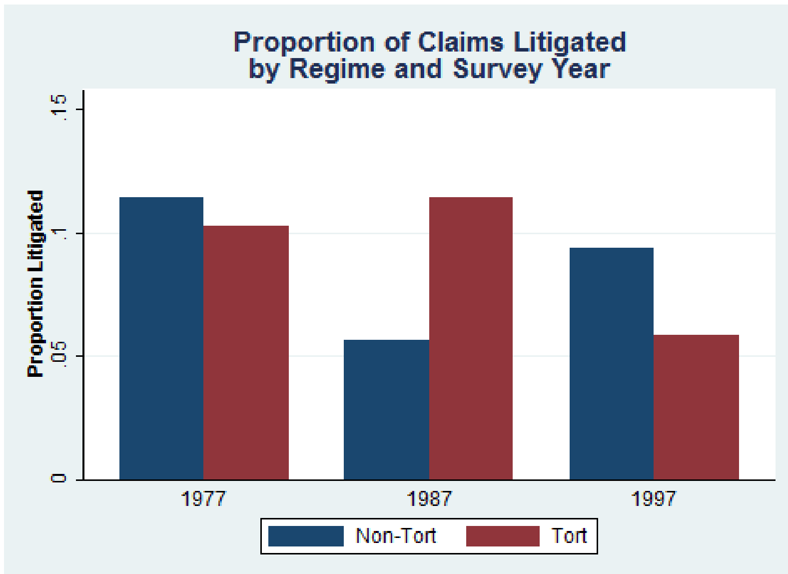
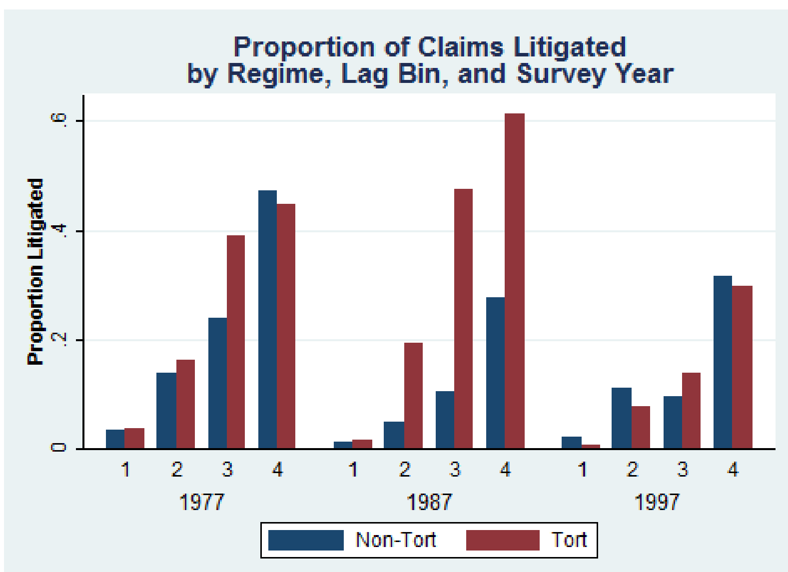


Figure 4: Histogram of Economic Loss Claimed, with Outliers

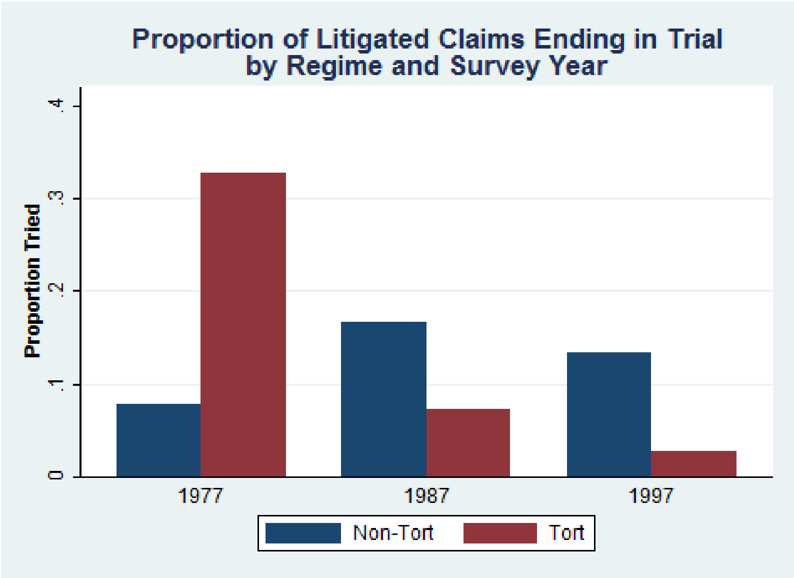


(a)

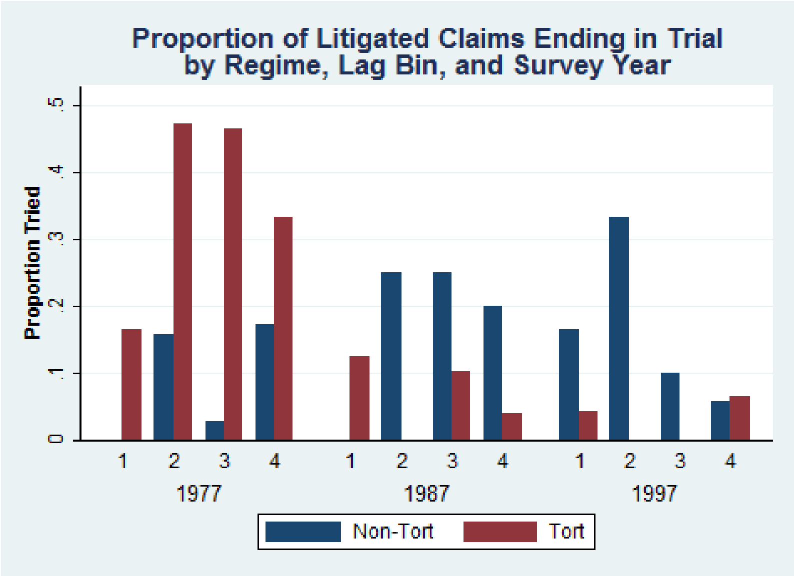


(b)

Figure 5: Litigation Probability by Legal Regime and Covariates



(a)



(b)

Figure 6: Trial Probability by Legal Regime and Covariates

Appendices

A.1 Proofs of Results

A.1.1 Proof of Proposition 1

The sufficient and necessary condition guaranteeing that $\frac{Z_t^{Bs}}{Z_t^{B1}} > \frac{Z_t^{As}}{Z_t^{A1}}$ is stated as:

$$(J_2 - J_1)\left[\pi^P - \pi^D\right] > r_s(J_2) - r_s(J_1) \tag{5}$$

$$J_2\left[\pi^P - \pi^D\right] - r_s(J_2) > J_1\left[\pi^P - \pi^D\right] - r_s(J_1) \tag{6}$$

$$Pr\left[Fail_s\right]_t^B > Pr\left[Fail_s\right]_t^A \tag{7}$$

Equation (7) follows from condition 3: $Pr\left[Fail_t\right]^l = J\left[\pi^P - \pi^D\right] > r_s(J)$. The following inequalities relate the probability of a claim in staet l failing at time t to Z_t^{ls}, the number of claims from stage $s \in \{1, 2\}$ in state l that close in period t.

$$1 - Pr\left[Fail_s\right]_t^B < 1 - Pr\left[Fail_s\right]_t^A \tag{8}$$

$$X_t^{B1} < X_t^{A1} \tag{9}$$

$$Z_t^{B1} < Z_t^{A1} \tag{10}$$

$$\frac{Z_t^{Bs}}{Z_t^{B1}} > \frac{Z_t^{As}}{Z_t^{A1}} \quad \blacksquare \tag{11}$$

Where inequality 10 is equivalent to inequality 9 because the number of claims from an initial set of claims arriving at t that settle in t is equal to the set of claims that settle in t that are in stage one.

A.1.2 Proof of Proposition 2

Part i

The probability of failure for claim x at state $s \in \{1, 2\}$ in period t can be characterized as:

$$\pi^P - \pi^D > \frac{r_s(J)}{J} \tag{12}$$

$$\pi^P \left(Y', \epsilon(\sigma_t^{2P})\right) - \pi^D \left(Y', \epsilon(\sigma_t^{2D})\right) > \frac{r_s(J)}{J} \tag{13}$$

Where $\hat{Y}^i = Y' + \epsilon,\ \epsilon \sim N(0, \sigma^2)$: subjective probabilities are formed as a function of the normally distributed error term ϵ.

This probability is composed of two mutually exclusive and nonstochastic outcomes: the parties fail to settle at stage s, or they settle at state s. Let K^* denote a constant. Then settlement failure and settlement imply two inequalities:

$$\sigma_t^{2P} - \sigma_t^{2D} > K^* > 0 \Rightarrow\ x \text{ fails to settle at } s \tag{14}$$

$$\sigma_t^{2P} - \sigma_t^{2D} < 0 < K^* \Rightarrow x \text{ settles at } s \tag{15}$$

The sufficient condition of Proposition 2 (i) states that $\sigma_t^2 > \sigma_{t+1}^2$, with the mean centered at zero in both t and $t+1$. Letting $\alpha > 0$, this implies:

$$E[\sigma_{t+1}^{2P} - \sigma_{t+1}^{2D} | \sigma_{t+1}^{2P} - \sigma_{t+1}^{2D} > 0] < E[\sigma_t^{2P} - \sigma_t^{2D} | \sigma_t^{2P} - \sigma_t^{2D} > 0] \tag{16}$$

$$E\left[\sigma_{t+1}^{2P} - \sigma_{t+1}^{2D} | \sigma_t^{2P} - \sigma_t^{2D} > 0\right] = \alpha E\left[\left(\sigma_t^{2P} - \sigma_t^{2D} | \sigma_{t+1}^{2P} - \sigma_{t+1}^{2D} > 0\right)\right] \tag{17}$$

Mapping the discrete events 16 and 17 back into stochastic probabilities,

$$E\left[\pi^P - \pi^D | \pi^P - \pi^D > 0\right]_t > E\left[\pi^P - \pi^D | \pi^P - \pi^D > 0\right]_{t+1} \tag{18}$$

$$Pr\left[Fail_s | \pi^P - \pi^D > 0\right]_t > Pr\left[Fail_s | \pi^P - \pi^D > 0\right]_{t+1} \tag{19}$$

When parties obtain mutually optimistic draws from ϵ, then the average magnitude of disagreement rises and the probability of disagreement rises with it.

Observe, however, that the corresponding inference cannot be made for the discrete condition that $\sigma^{2P} - \sigma^{2D} > 0$. This is because when parties obtain mutually pessimistic draws from ϵ, the probability that they fail to settle is zero: $\sigma_t^{2P} - \sigma_t^{2D} < 0 \Rightarrow \sigma_t^{2P} - \sigma_t^{2D} < K^*$. This disparity is driven by strictly positive litigation costs $r_s(J)$: in the absence of optimism bias, parties possess no reason to reach disagreement.[56] Therefore

$$Pr\left[Fail_s|\pi^P - \pi^D < 0\right]_t = Pr\left[Fail_s|\pi^P - \pi^D > 0\right]_{t+1} = 0 \tag{20}$$

Finally, combining inequalities 19 and 20 implies the necessary condition:

$$X_t^{B1} > X_{t+1}^{A1} \tag{21}$$

$$Z_t^{B1} > Z_{t+1}^{A1} \tag{22}$$

$$\frac{Z_t^{Bs}}{Z_t^{B1}} < \frac{Z_{t+1}^{Bs}}{Z_t^{B1}} \quad \blacksquare \tag{23}$$

Part ii

The proof of (ii) is similar to the proof of Proposition 1 demonstrated in appendix A.1.1 above. Let $0 < r_s(J_2) - r_s(J_1) < (J_2 - J_1)\left(\pi^P - \pi^D\right)$ in period $t+1$. Because $\sigma_{t+1}^{2B} = \sigma_{t+1}^{2A}$, the following implication holds:

$$\left[F^P\left(Y' + \epsilon\right) - F^D\left(Y' + \epsilon\right)\right]_{t+1}^B - \frac{r_s\left(J\right)}{J} > \left[F^P\left(Y' + \epsilon\right) - F^D\left(Y' + \epsilon\right)\right]_{t+1}^A - \frac{r_s\left(J\right)}{J} \tag{24}$$

$$Pr\left[Fail_s\right]_{t+1}^B > Pr\left[Fail_s\right]_{t+1}^A \tag{25}$$

The step from 24 to 25 is proven by 7 in Proposition 1.

[56]This standard result of Divergent Expectations models is *ceteris paribus*. In particular, it does not hold when parties have asymmetric stakes in the trial.

Now let $J^{**} > (J_2 - J_1)\left(\pi^P - \pi^D\right)$. Then

$$(J_2 - J_1)\left(\pi^P - \pi^D\right) < J^{**} < r_s(J_2) - r_s(J_1) \tag{26}$$

$$Pr\left[Fail_s\right]^B_{t+1} < Pr\left[Fail_s\right]^A_{t+1} \tag{27}$$

$$\frac{Z^{Bs}_{t+1}}{Z^{B1}_{t+1}} > \frac{Z^{As}_{t+1}}{Z^{A1}_{t+1}} \quad \blacksquare \tag{28}$$

Where the final step is the same as the one from 7 to 11.

$$\sigma^{2B}_t > \sigma^{2B}_{t+1} \Rightarrow Pr[Fail_s]^B_t > Pr[Fail_s]^B_{t+1}$$

B.2 Additional Tables

Table B1: State Tort Liability Regimes for Insurance Bad Faith to 1997[1,2,3]

State	Tort Start-End	State	Tort Start-End
AK	1974-	MO	
AL	1981-	MS	1984-
AR	1984-	MT	1982-
AZ	1982-	NC	1976-
CA	1973-	ND	1979-
CO	1983-	NE	
CT	1973-	NH	
DC		NJ	
DE	1982-1995	NM	1974-
FL	1975-1986	NV	1975-
GA	Unknown-1989	NY	
HI	1996-	OH	1983-
IA	1988-	OK	1977-
ID	1986-	OR	
IL		PA†	1990-
IN	1993-	RI	1980-
KS		SC	1983-
KY	1977-	SD	1986-
LA†	Unknown-	TN	
MA†	Unknown-	TX	1987-
MD		UT	
ME		VA	
MI		VT	1979-
MN		WA	1992-
		WI	1978-
		WV	
		WY	1990-

Based on Stempel (2006), Ostrager and Newman (2008), and Corp. and LLP (2008) [1] Blank space indicates no punitive damages through 1997.
[2] "-" indicates punitive damages regime lasted through at least 1997. Illinois (2002) is only known state to have enacted punitive damages after 1997.
[3] "Unknown" is treated as pre-1977. Regression results robust to dropping these states.
† Punitive damages but no tort regime.

C.3 Additional Figures

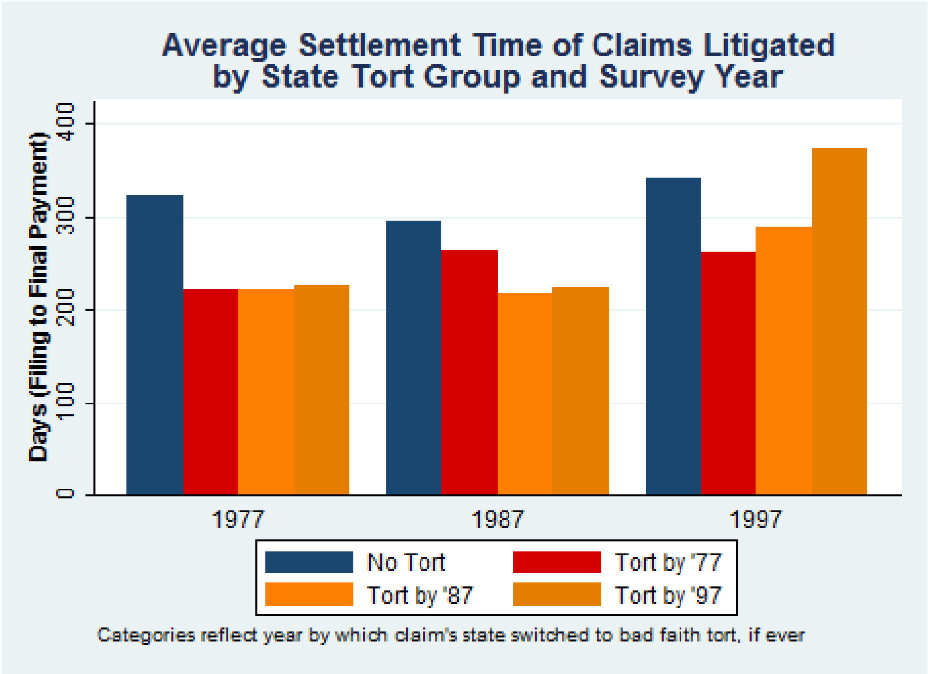


Figure B1: Average Settlement Times by Tort Switch Group and Survey Year

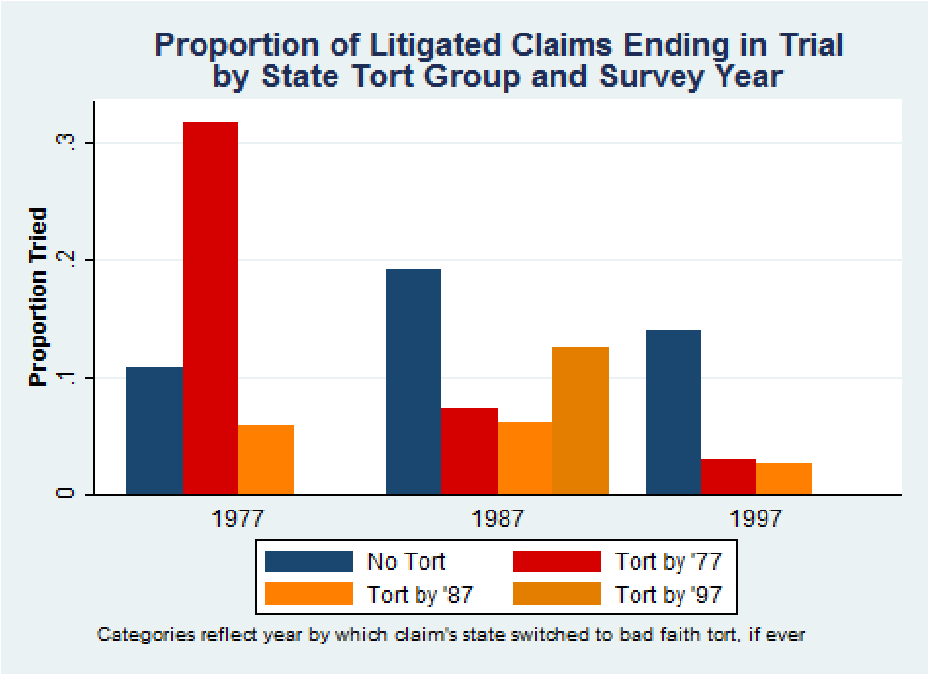


Figure B2: Average Conditional Trial Rates by Tort Switch Group and Survey Year

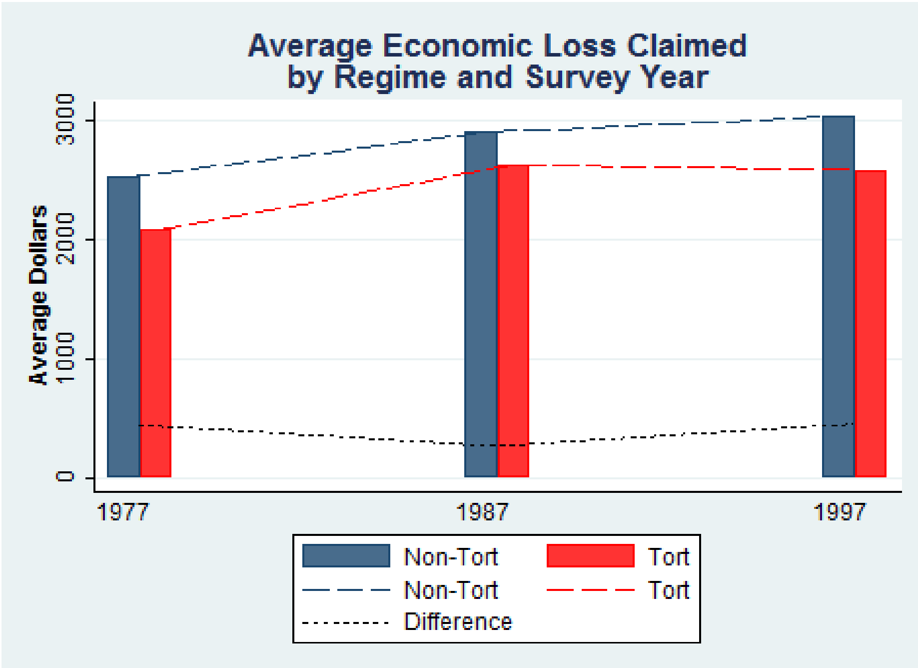


Figure B3: Mean Economic Loss Claimed by Survey Year and Regime

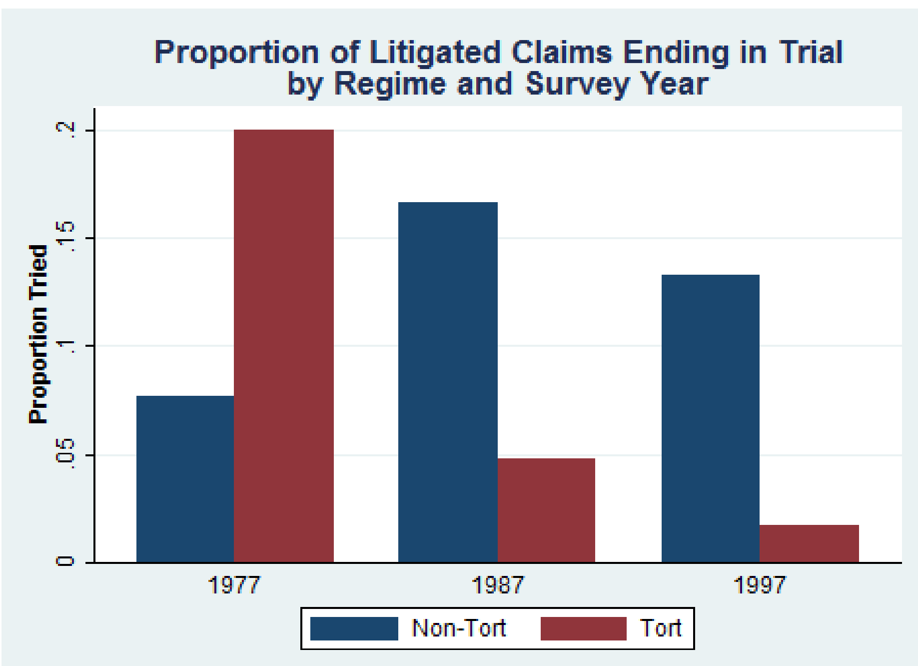


Figure B4: Average Conditional Trial Rates, Excluding California