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## **AN ASYMMETRIC INFORMATION MODEL OF LITIGATION**

KEITH N. HYLTON

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## AN ASYMMETRIC INFORMATION MODEL OF LITIGATION

Keith N. Hylton \*

### *Abstract*

This paper presents a cradle-to-grave model of tort liability, incorporating the decision to comply with the due-care standard, the decision to file suit, and the decision to settle. I use the model primarily to examine settlement rates, plaintiff win rates, and compliance with the due-care standard. The key results of the model are as follows: (1) litigation to judgment occurs only when some but not all actors comply with the due-care standard, and (2) if defendants have the information advantage at trial, plaintiff win rates generally will be less than fifty percent. I apply the model and its simulation results to several empirical issues in the litigation literature. The model simulation indicates that the British rule for allocating legal costs is superior to alternatives in terms of social welfare. In addition, the model is capable of explaining several empirical features of litigation and puzzles in the literature on trial outcomes.

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\* Boston University School of Law; knhylton@bu.edu. I am indebted to Bob Bone for several key contributions as I worked through early drafts of this paper. I have also benefited from many important suggestions by Steve Marks and Ted Sims, also on early drafts; and from the referees and editors of this journal. I thank Bhaskar Chattaraj and Yulia Rodionova for excellent research assistance.

## I. INTRODUCTION

This paper presents a model of the liability system that incorporates the decision to comply with the legal standard, to bring suit, and to settle a dispute. The model assumes defendants have an informational advantage in litigation; specifically, the defendant knows whether or not he violated the due-care standard and the plaintiff does not know.

I use the model primarily to examine when disputes will be settled or litigated to judgment. In particular, I examine three issues. First, what is the connection between compliance rates and trial outcomes? Will victims bring suit in an equilibrium in which all potential injurers are complying with the due-care standard, and if so, will the suits be pursued to judgment? Will victims bring suit in an equilibrium in which no potential injurers are complying with the due-care standard? I show that victims will continue to bring suit in either case, but that their claims will be settled. Indeed, *litigation to judgment occurs only in equilibria in which some but not all actors comply with the due-care standard.*

Second, what factors determine the likelihood that a dispute will be settled? The standard approach to this question, the Landes-Posner-Gould (LPG) model,<sup>1</sup> suggests that litigation is less likely as litigation expenses increase and as the litigation stakes (the difference between what the plaintiff expects to receive and what the defendant thinks the plaintiff will receive) fall. In this model, the costs-stakes comparison is only one of several factors influencing the decision to settle. The probability of settlement is also influenced by the rate of compliance and by the strategic decisions of litigants.

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<sup>1</sup> See Landes (1971), Posner (1973), and Gould (1973).

Third, what should one expect of plaintiff win rates? The famous and controversial Priest-Klein analysis suggested plaintiff win rates should be fifty percent.<sup>2</sup> Recent articles have shown that when information is asymmetric among litigants, plaintiff win rates of fifty percent are unlikely.<sup>3</sup> This paper extends this line of research by yielding a stronger result: *if defendants have the informational advantage, plaintiff win rates generally will be less than fifty percent.*

The model in this paper has several implications for empirical results and controversies in the litigation literature. A recent spate of empirical papers tries to determine whether asymmetric-information or divergent-expectations (Priest-Klein) theories provide a better account of trial outcomes.<sup>4</sup> However, in order to evaluate these two general theories, it is important to develop them further in order to generate as many testable implications as possible.

The main result here regarding plaintiff win rates is consistent with empirical evidence.<sup>5</sup> Medical malpractice, product liability, employment discrimination, antitrust, and several other areas of litigation consistently exhibit plaintiff win rates well below fifty percent.<sup>6</sup> The implications of this model are considerably easier to reconcile with empirical studies of litigation in these areas than those of the divergent-expectations theory.

I use the model to examine the implications of court bias for plaintiff win rate statistics. The model shows that the relationship between changes in the plaintiff win rate

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<sup>2</sup> More precisely, the Priest-Klein theorem predicts fifty-percent win rates when the perceived amount at stake is the same for the plaintiff and the defendant.

<sup>3</sup> See Shavell (1996), Hylton (1993).

<sup>4</sup> Osborne (1999); Waldfogel (1998).

<sup>5</sup> Eisenberg (1990); Gross and Syverud (1991).

<sup>6</sup> Harvard Medical Practice Study, 1990; Perloff and Rubinfeld, 1987; Eisenberg, 1990; Siegelman and Donohue, 1995.

and changes in the probability of judicial error are not as simple as first intuition would suggest. Consider the probability of an erroneous finding of guilt (type-2 error). An increase in the probability of type-2 error implies that innocent defendants are more likely to be found guilty. The common intuition is that this should lead to an increase in the plaintiff win rate. However, in this model an increase in type-2 error may lead to a reduction in the plaintiff win rate. If informed guilty defendants settle more frequently in response to the change, the sample of disputes litigated to judgment will contain a higher proportion of innocent defendants, possibly resulting in a reduction in the plaintiff win rate. I use this result to reexamine the judge-jury win rate puzzle identified by Clermont and Eisenberg (1992).

In addition, this model reconciles some conflicting accounts of the liability system. It is not hard to find descriptions of the system that suggest that it works somewhat like a lottery,<sup>7</sup> and yet it is well known that lawyers reject a large percentage of claims brought to their attention by potential plaintiffs.<sup>8</sup> It is clear in this model that some evidence suggesting the litigation process is inaccurate in assessing liability (e.g., a high frequency of false convictions) is not inconsistent with its performing well as a deterrent mechanism. Indeed, the settlement process captured by this model exacerbates the tendency toward false convictions already present in an imperfectly accurate though functional liability system.

Finally, I apply the model to the fee-shifting question examined in so many law and economics papers. The model simulation indicates that the British rule (loser pays) outperforms all other fee-shifting rules on welfare grounds. The key reason for the

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<sup>7</sup> See Saks (1992), pp. 1154-1168; Localio *et al.* (1991).

<sup>8</sup> Saks, pp. 1190-92.

superiority of the British rule is its effect on compliance. The British rule generates the highest level of compliance because it maximizes the spread between the expected liability levels of guilty and innocent defendants.

The paper is organized as follows. Section II presents the model and the basic results. Section III presents applications of the model. Section IV discusses implications for the literature.

## II. THE MODEL

### A. Assumptions

All actors are risk neutral. Victims suffer losses from accidents, the risk of loss can be reduced by the exercise of precaution by potential injurers, and it is costly for the injurers to take care.<sup>9</sup> Let  $p$  = the probability of loss if potential injurers do not take care,  $p > 0$ ; and  $q$  = the probability of loss if injurers do take care,  $p > q > 0$ . Let the random variable  $v$  = the loss suffered by an accident victim and damages awarded by the court,  $v > 0$ . I assume  $v$  has the distribution function  $H$ , and is observed by all parties once realized. Let the random variable  $x$  = the cost to a potential injurer of taking care,  $x > 0$ . I assume  $x$  has the distribution function  $G$ , and is unobservable to potential victims. Each injurer, however, knows his cost of care.

Litigation is costly and courts occasionally make mistakes in deciding liability. Let  $C_p$  = the plaintiff's (victim's) cost of litigating,  $C_p > 0$ ;  $C_d$  = the defendant's (injurer's) cost of litigating,  $C_d > 0$ . Let  $Q_1$  = the probability of type-1 error; i.e., the court erroneously

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<sup>9</sup> The model in this paper builds on Hylton (1990).

fails to hold a defendant liable,  $0 < Q_1 < 1$ ;  $Q_2$  = the probability of type-2 error; i.e., the court erroneously holds a defendant liable,  $0 < Q_2 < 1$ . Victims and injurers know  $Q_1$  and  $Q_2$ , and the courts are sufficiently accurate that

$$1 - Q_1 > Q_2 . \quad (1)$$

The actor violates the due-care standard if he fails to take care when the cost of taking care is less than the increase in expected loss to the victim; i.e., when  $x < (p - q)E(v)$ . In negligence law, this standard is known as the Hand formula.<sup>10</sup> However, it can also serve as a model of a general balancing test similar to those used in most areas of law.<sup>11</sup>

## B. Settlement and Litigation Incentives

Let  $P_p$  represent the plaintiff's rational estimate of the probability of a verdict in his favor. Because the plaintiff does not know whether the defendant complied with the legal standard,  $P_p = W(1 - Q_1) + (1 - W)Q_2$ , where  $W$  is the probability, given an injury, that the injurer did not comply with the due-care standard.

Suit is brought if the plaintiff's expected judgment,  $P_p v$ , exceeds the expected cost of bringing suit, or, equivalently,  $v$  exceeds the threshold  $v_1 = C_p / P_p$ . If this condition does not hold, the plaintiff's threat to sue would not be credible, and so the defendant would refuse to make a positive settlement offer to the plaintiff.

Let  $P_d$  be the defendant's estimate of the probability of a verdict for the plaintiff. Since the defendant knows whether he complied with the legal standard,  $P_d = 1 - Q_1$  when

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<sup>10</sup> This formulation of the negligence standard was first stated by Judge Learned Hand in *United States v. Carroll Towing Co.*, 159 F. 2d 169 (2d Cir. 1947).

<sup>11</sup> For example, the Rule of Reason of antitrust requires the court to balance the social benefits against the social harms caused by a restraint on competition. Indeed, since almost every legal standard involves some ex post balancing of the costs and benefits of the defendant's conduct, one could argue that the Hand formula

the defendant did not comply and  $P_d = Q_2$  when the defendant did comply. Thus, if the defendant is guilty his expected liability is  $(1-Q_1)v+C_d$ , and if he is innocent his expected liability is  $Q_2v+C_d$ .

The non-compliance probability,  $W$ , is endogenous. Let  $E(L_{nc})$  be the expected liability of a guilty defendant (i.e., one who failed to take care and for whom  $x < (p-q)E(v)$ ) and  $E(L_c)$  be the expected utility of an innocent defendant.<sup>12</sup> Applying Bayes' rule,

$$\frac{p \int_{E(L_{nc})-E(L_c)}^{(p-q)E(v)} dG(x)}{p \int_{E(L_{nc})-E(L_c)}^{\infty} dG(x) + q \int_0^{E(L_{nc})-E(L_c)} dG(x)} \quad (2)$$

I follow Png (1987) in modeling the litigation game, illustrated in figure 1. First, the plaintiff files (or does not file) suit; second, the defendant makes a settlement offer (formally, each type of defendant selects a probability distribution over the possible settlement amounts); third, the plaintiff either accepts or rejects the defendant's offer; fourth, the plaintiff, if he rejects, either litigates or drops the action. The main result is the following:

*Proposition 1:* (1) Assume  $W(1-Q_1-Q_2)v > C_p + C_d$ . Then there is a mixed strategy equilibrium, in which two possible offers are observed from guilty defendants:  $s_H^g = (1-Q_1)v - C_p$  and  $s^* = \max \{0, Q_2v - C_p\}$ . From innocent defendants, the only offers are  $s_H^i = Q_2v + C_d$  and  $s^* = \max \{0, Q_2v - C_p\}$ .

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provides a good general description of the vast majority of legal standards. For a similar argument, see Craswell (1999), at 2217-2219.

(a) In particular, if  $Q_2v - C_p < 0$ , then  $s^* = 0$ . The innocent defendant offers  $s^*$  with probability one, and the probability the guilty defendant offers  $s^*$  is

$$\gamma^* = (1-W)(C_p - Q_2v) / [W((1-Q_1)v - C_p)]. \quad (3)$$

The probability the plaintiff accepts  $s^*$  is

$$\theta^* = (C_p + C_d) / [(1-Q_1)v + C_d]. \quad (4)$$

(b) If  $Q_2v - C_p > 0$ , then  $s^* = Q_2v - C_p$ , and the innocent defendant offers  $s^*$  with probability one, and the probability the guilty defendant offers  $s^*$  is

$$\gamma^{**} = 0. \quad (5)$$

The probability the plaintiff accepts  $s^*$  is

$$\theta^{**} = (C_p + C_d) / [(1-Q_1-Q_2)v + C_p + C_d]. \quad (6)$$

(2) Assume  $W(1-Q_1-Q_2)v < C_p + C_d$ . Then there is a pure pooling equilibrium in which all disputes settle with both innocent and guilty defendants paying  $S' = [W(1-Q_1) + (1-W)Q_2]v - C_p$ .

*Proof:* All proofs are provided in the Appendix.

A few remarks are in order. Note that there are three “thresholds” suggested by this model. The first is  $v_1 = C_p / C_d$ , the level of victim loss at which a lawsuit becomes a break-even proposition for an uninformed plaintiff. For  $v < v_1$  no litigation occurs because no lawsuits are filed. The second threshold is  $v_2 = (C_p + C_d) / [W(1-Q_1-Q_2)]$ , which is the level of loss above which an equilibrium in which litigation occurs becomes feasible. This corresponds, and is the equivalent in this model, to a more familiar threshold result known as the Landes-Posner-Gould condition. According to LPG, litigation occurs only when ( $P_p$ -

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<sup>12</sup> I use “guilty” to refer to a defendant who is liable for breaking the due-care standard; and otherwise I refer

$P_d)v > C_p + C_d$ , which is equivalent to  $W(1 - Q_1 - Q_2) > C_p + C_d$ . The third threshold is  $v_3 = C_p / Q_2$ , which is the level at which a lawsuit against an innocent defendant breaks even. When  $v > v_3$ , guilty defendants no longer attempt to pool with innocents, because if they pool with any positive probability, plaintiffs will pursue the claim to judgment. Paradoxically, in this equilibrium separation occurs among the two defendant types precisely because even the weakest (or frivolous) legal claims are profitable to plaintiffs.

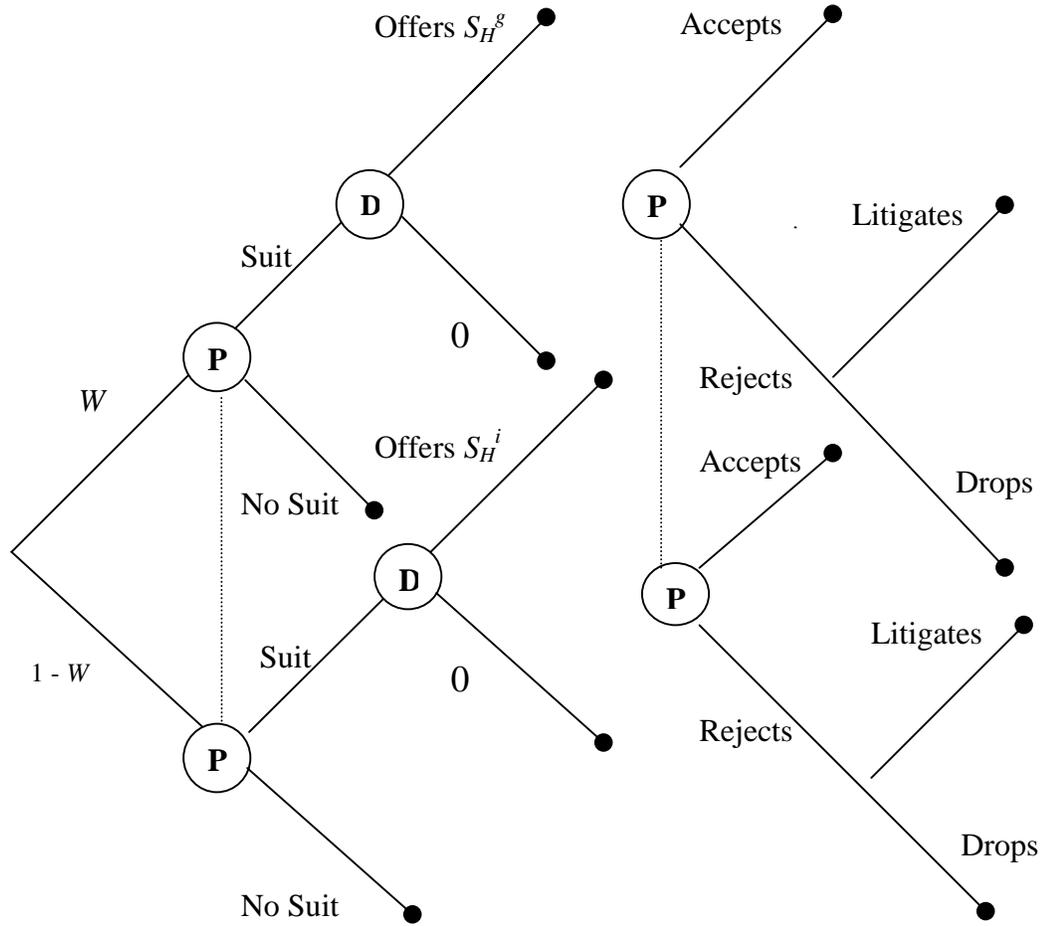


Figure 1: Case where  $Q_2v - C_p < 0$ .

From the foregoing, the expected percentage of disputes that are litigated to judgment, given an injury, is

$$\begin{aligned}
 (1-H(v_2))\{ & W\text{Prob}(v < v_3 | v > v_2)E(\gamma^*(1-\theta^*) | v > v_2, v < v_3) \\
 & + (1-W)[\text{Prob}(v < v_3 | v > v_2)E((1-\theta^*) | v > v_2, v < v_3) \\
 & + \text{Prob}(v > v_3 | v > v_2)E((1-\theta^{**}) | v > v_2, v > v_3)]\}. \tag{7}
 \end{aligned}$$

The following is an important, though straightforward, implication of (7) and Proposition 1.

*Proposition 2: If all potential injurers comply with the due-care standard, or if no potential injurers comply with the due care standard, no disputes will be litigated to judgment.*

No disputes are litigated to judgment in the extreme cases of full compliance and total noncompliance because all initial settlement offers are accepted. In the former case, defendants make low offers equal to  $Q_2v - C_p$ , which are accepted. In the latter case, defendants cannot attempt to pool (there are no innocents) because plaintiffs would respond by pursuing every claim to judgment.

### III. APPLICATIONS

## A. Determinants of the Probability of Settlement

It is useful to compare the implications of this model to those of the common approach to modeling settlement, the Landes-Posner-Gould (LPG) model. Once suit is filed, litigation to judgment occurs (or settlement does not occur) in the LPG model when  $(P_p - P_d)v > C_p + C_d$ , which suggests that the probability of litigation to judgment (post-filing) increases as the litigation stakes increase and falls as litigation costs increase.

Equation (7) shows that there are several routes through which a change in litigation costs or in the factors determining litigant's expectations influence the probability that a dispute will be litigated to judgment: first, through altering the litigation threshold probability  $1 - H(v_2)$ ; second, through influencing the strategic incentives of the parties, which determine  $\gamma$  and  $\theta$ ; third, through altering the equilibrium compliance rate,  $1 - W$ ; fourth, through altering the threshold probability that  $v > v_3$ , the point at which "frivolous" claims become profitable. For simplicity, let us call these, respectively, the "threshold", "strategic incentives", "compliance", and "frivolous claims" effects.

Consider an intuitive account of these effects. Litigation decreases as the litigation threshold level  $v_2$  increases. The reasoning is at bottom the same as in the LPG model: the offering party has more to gain from appropriating the settlement surplus rather than pushing the dispute to the judgment phase. Obviously, litigation increases as the probability of the guilty defendant making a low offer increases and the probability of a plaintiff rejecting such an offer increases. An increase in  $W$ , other things being equal, reduces litigation because guilty defendants make the low settlement offer less often than do the innocent. Finally, a decrease in the frivolous-claims threshold  $v_3$  reduces litigation

because plaintiffs reject the low offers less frequently in the equilibrium in which defendant types separate. The implications can be summarized as follows:

*Proposition 3: The effect of a change in  $Q_1$ ,  $Q_2$ ,  $C_p$ , or  $C_d$  depends on four effects: the threshold effect, the compliance effect, the strategic-incentives effect, and the frivolous-claims effect. The LPG model provides an accurate prediction of settlement incentives only if the threshold effect dominates or is consistent with the sum of the other effects.*

## **B. Determinants of Trial Outcomes**

Empirical studies have demonstrated that plaintiff win rates are consistently below fifty percent in medical malpractice, product liability, employment discrimination, and several other areas of litigation.<sup>13</sup> This is inconsistent with Priest-Klein model's prediction of fifty percent (unless we assume asymmetric stakes). In this section, I show that under the assumptions of this model, plaintiff win rates below fifty percent are likely to be observed. I also examine other trial outcome statistics, such as the rate of erroneous findings of liability, and consider the influence of changes in the likelihood of judicial error on plaintiff win rates.

### *1. Trial Outcome Statistics*

Let the proportion of guilty defendants who do not settle be  $\beta_{nc}$ . Let the proportion of innocent defendants who do settle be given by  $\beta_c$ . The plaintiff's win rate at trial is

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<sup>13</sup> For empirical evidence on plaintiff win rates, see Eisenberg, 1990, Gross and Syverud, 1991, Siegelman and Donohue, 1995.

$$\pi = \frac{(1-W)\beta_c Q_2 + W\beta_{nc}(1-Q_1)}{(1-W)\beta_c + W\beta_{nc}} \quad (8)$$

Note that if  $\beta_{nc} = \beta_c$ , the plaintiff's win rate at trial is equal to  $P_p$ , the plaintiff's estimate of the probability of a finding of guilt. However, the two numbers differ generally because of divergent settlement rates across guilty and innocent defendants.<sup>14</sup>

$$\beta_c = \int_{v_2}^{\max(v_2, v_3)} (1-\theta^*) dH(v) + \int_{\max(v_2, v_3)}^{\infty} (1-\theta^{**}) dH(v). \quad (9)$$

Further,

$$\beta_{nc} = \int_{v_2}^{\max(v_2, v_3)} \gamma^* (1-\theta^*) dH(v) \quad (10)$$

Define  $\mu_c = \beta_c$ ,  $\mu_{nc} = [W/(1-W)]\beta_{nc}$  (for  $W < 1$ ), and  $\alpha^* = [W/(1-W)]\gamma^*$ . For  $W < 1$  the plaintiff win rate can be expressed:

$$\pi = \frac{\mu_c Q_2 + \mu_{nc} (1-Q_1)}{\mu_c + \mu_{nc}}, \quad (11)$$

where

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<sup>14</sup> Expression (10) is actually the probability of non-settlements, given that a lawsuit has been filed.

$$\mu_{nc} = \int_{v_2}^{\max(v_2, v_3)} \alpha^* (1 - \theta^*) dH(v) \quad (12)$$

Expressions (11) and (12) have implications for the Priest-Klein prediction of a fifty-percent plaintiff win rate. If  $Q_1$  and  $Q_2$  are equal and the coefficients  $\mu_{nc}$  and  $\mu_c$  are also equal, the plaintiff win rate will be fifty percent.<sup>15</sup> But  $\mu_{nc}$  and  $\mu_c$  are unlikely to be equal. Note also that  $\alpha^*$  falls as the ratio of litigation costs to litigation stakes falls (and thus as  $v$  increases). Unless the vast majority of disputes involve stakes that are small,  $\alpha^*$  will be less than one. Hence,

*Proposition 4: Suppose that the rate of noncompliance ( $W$ ) is positive and less than one. As a general rule,  $\mu_{nc} < \mu_c$ . Thus, if the rates of type-1 and type-2 error are equal the plaintiff win rate generally will be less than fifty percent. However, the win rate may exceed fifty percent when the stakes are low and the rate of noncompliance is high ( $W > 1/2$ ).<sup>16</sup>*

The key difference between this model and that of Priest and Klein is that the latter assumes parties are symmetrically informed with respect to the plaintiff's likelihood of winning, while in this model only the defendant knows his true status. Because of informational asymmetry, guilty defendants settle at higher rates than do innocent; and as a result, the pool of litigants contains a disproportionately large share of innocent defendants.

Why are the stakes important? As the stakes increase, the defendant's incentive to make a low offer on purely strategic grounds decreases (holding the rate of non-compliance constant). It follows that the innocent will make up a larger share of the pool of defendants who make low settlement offers, which implies a low plaintiff win rate. Conversely, if the stakes are low relative to the costs of litigation, the incentive to make a low offer for strategic purposes increases, which leads to a higher share of guilty among among the pool of defendants who make low settlements offers. As the rate of noncompliance increases, plaintiffs will be more willing to call the bluff of a guilty defendant who makes a low offer. Putting these together suggests that win rates may exceed fifty percent when the stakes are low and the rate of noncompliance is high.

Two other statistics of interest are the proportion of defendants who are innocent and the proportion of losing defendants who are innocent (false convictions probability). Defining  $Prob(I|lose)$  = the conditional probability of innocence, given a verdict against the defendant,

$$Prob(I|lose) = \frac{(1-W)\beta_c Q_2}{(1-W)\beta_c Q_2 + W\beta_{nc}(1-Q_1)} \quad (13)$$

which is equivalently

$$Prob(I|lose) = \frac{\mu_c Q_2}{\mu_c Q_2 + \mu_{nc}(1-Q_1)}. \quad (14)$$

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<sup>15</sup> Note that a fifty percent win rate is also observed if  $1-Q_1=Q_2=0.5$ . But this would violate the accuracy condition in (1).

<sup>16</sup> Proposition 4 is restricted to  $0 < W < 1$ , because if  $W=1$  or if  $W=0$  all disputes will settle (see Proposition 2).

Defining  $Prob(I|litigate)$  = the conditional probability of innocence, given the defendant litigates,

$$Prob(I|litigate) = \frac{(1-W)\beta_c}{(1-W)\beta_c + W\beta_{nc}}, \quad (15)$$

or equivalently

$$Prob(I|litigate) = \frac{\mu_c}{\mu_c + \mu_{nc}} \quad (16)$$

We can use these expressions to examine posterior rates of false convictions and false acquittals. First, because  $\mu_c > \mu_{nc}$  generally, (16) implies that innocents will (generally) make up more than half of the pool of litigants. Second, (14) implies that innocents will make up more than half of the pool of losing defendants if  $(1-Q_1)/Q_2 < \mu_c/\mu_{nc}$ . Thus, the rate of false convictions can exceed fifty percent. Third, (14) implies that as  $[(1-Q_1)/Q_2](\mu_c/\mu_{nc})$  approaches zero, the probability of false conviction ( $Prob(I|lose)$ ) approaches one. Thus, two factors account for the frequency of false convictions. One is accuracy; as the trial process becomes less accurate ( $(1-Q_1)/Q_2$  falls), the probability of a false conviction increases. The other is compliance; as the rate of compliance increases ( $W$  approaches zero), the ratio  $\mu_{nc}/\mu_c$  falls to zero, which implies the probability of a false conviction approaches one.

Another statistic of interest to court observers is the posterior rate of false acquittals, i.e., the proportion of winning defendants who are in fact guilty, which is given by

$$Prob(G|win) = \frac{\mu_{nc} Q_1}{\mu_{nc} Q_1 + \mu_c (1 - Q_2)} \quad (17)$$

As a general rule,  $Prob(G|win) < 1/2$ . To see this, note that (18) implies  $Prob(G|win) > 1/2$  only if  $Q_1/(1 - Q_2) > \mu_c/\mu_{nc}$ . But this requires (generally)  $Q_1/(1 - Q_2) > 1$ , which contradicts the court-accuracy assumption (1). The probability of a false acquittal at trial is generally less than fifty percent because the selection process tends to screen out guilty defendants.

Since one goal of this paper is to develop implications that can be used to empirically test the validity of asymmetric information models relative to divergent-expectations models, it is helpful to consider the differences between these results and the implications of the Priest-Klein theorem. Note that  $Prob(I|lose) = Prob(lose|I)(1-W)/Prob(lose)$ , where  $Prob(lose) = Prob(lose|I)(1-W) + Prob(lose|G)W$ . Under the Priest-Klein model  $Prob(lose|I) = Prob(lose|G)$ , and thus,  $Prob(I|lose) = 1 - W$ . Hence, in the Priest-Klein model, the rate of false convictions is equal to the rate of compliance. Similarly,  $Prob(G|win) = Prob(win|G)W/Prob(win)$ , where  $Prob(win) = Prob(win|G)W + Prob(win|I)(1 - W)$ . Thus, under the Priest-Klein assumptions,  $Prob(G|win) = W$ , the rate of false acquittals equals the rate of noncompliance.<sup>17</sup>

## 2. Effects of Changes in Judicial Error Rates

How is the plaintiff win rate affected by changes in the probability of judicial error? The following equations shed light on this.

$$\frac{\partial \pi}{\partial Q_1} = \frac{-\mu_{nc}}{\mu_c + \mu_{nc}} + \frac{(1-Q_1-Q_2)\mu_c\mu_{nc}(\varepsilon_{nc}^1 - \varepsilon_c^1)}{(\mu_c + \mu_{nc})^2 Q_2} \quad (18)$$

$$\frac{\partial \pi}{\partial Q_2} = \frac{\mu_c}{\mu_c + \mu_{nc}} + \frac{(1-Q_1-Q_2)\mu_c\mu_{nc}(\varepsilon_{nc}^2 - \varepsilon_c^2)}{(\mu_c + \mu_{nc})^2 Q_2} \quad (19)$$

The effect of an increase in error can be separated into two components. One reflects the influence of a change in the rate of error holding fixed the probabilities of litigation for guilty and innocent defendants. The second captures the influence of a change in the error rate on the probabilities of litigation among guilty and innocent defendants. Consider for example an increase in the rate of type-1 error. The first term is negative because an increase in  $Q_1$  reduces the win rate of plaintiffs. The second term is ambiguous and requires a comparison of elasticities of litigation. If the elasticity of litigation with respect to  $Q_1$  for innocent defendants exceeds that for guilty defendants ( $\varepsilon_{nc}^1 - \varepsilon_c^1 < 0$ ), innocents become a larger proportion of the sample of litigants as  $Q_1$  increases, reducing the plaintiff win rate further. On the other hand, if  $\varepsilon_{nc}^1 - \varepsilon_c^1 > 0$ , the net effect of an increase in type-1 error is ambiguous. A similar explanation serves for the case of an increase in type-2 error. Holding fixed probabilities of litigation, an increase in type-2 error increases the plaintiff win rate because it the rate of false convictions. However, if an increase in type-2 error increases the proportion of innocents in the sample

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<sup>17</sup> The Priest-Klein results are observed in this model when error rates are equal, and trial selection occurs so that the pool of litigating defendants is equally divided between the guilty and the innocent. Technically, Priest-Klein results are observed when  $Q_1 = Q_2$  and  $(1-W)\beta_c = W\beta_{nc}$ .

of litigating defendants ( $\epsilon_{nc}^2 - \epsilon_c^2 < 0$ ), then the net effect of the type-2 error increase becomes ambiguous.

In this model, a change in the probability of error influences the mix of innocent and guilty defendants in the sample of litigants by influencing the compliance rate and the rate at which guilty defendants make low settlement offers. Focusing on the latter, (3) and (4) imply that

$$\partial \gamma^* / \partial Q_2 = (\partial \alpha^* / \partial Q_2) [(1-W)/W] - (\alpha^* / W^2) (\partial W / \partial Q_2), \quad (20)$$

and

$$\partial \theta^* / \partial Q_2 = 0. \quad (21)$$

The first term in (20) is negative and the second is negative for  $0 < W < 1$ .<sup>18</sup> Thus, under the assumptions of this model, one could observe the counterintuitive phenomenon of an increase in type-2 error leading to a reduction in the plaintiff win rate. The reason this possibility arises is that as the probability of type-2 error increases, so does the probability that the plaintiff will have a profitable (and therefore credible) claim against an innocent defendant. As this latter possibility increases, the guilty defendant's incentive to pool with innocent defendants falls.

### C. Simulation and Application to Choice Among Litigation Cost Allocation Rules

Figures 2–6 show simulations of the model under alternative litigation cost allocation rules. The horizontal axis measures the cost of litigation for either plaintiff or defendant as

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<sup>18</sup> See Hylton 1990; Polinsky and Shavell, 1989.

a fraction of the average damage judgment ( $C_p/v$ , assuming  $C_p = C_d$ ).<sup>19</sup> Consistent with the theoretical results, the plaintiff win rates are all below fifty percent. Figure 4 suggests that the proportion of innocent defendants is high – above fifty percent – under each rule for all of the parameter values.

Since there is by now a cottage industry in studying the relative merits of the British and American litigation cost allocation rules, it is surprising that no study to date formally compares alternative fee-shifting rules on overall welfare grounds.<sup>20</sup> The model in this paper permits such a comparison, as shown in the figures below with results under four litigation cost allocation rules (American, British, Pro-defendant, and Pro-plaintiff).<sup>21</sup> Defining welfare as the negative of the sum of injury costs, avoidance costs, and litigation costs, the simulation results show that the British rule outperforms all others in terms overall welfare (Figure 6). The four allocation rules all performed in a roughly similar manner in terms of litigation cost, with the British rule, consistent with earlier analyses, generating the most litigation.<sup>22</sup> The substantial difference between the British rule and the others in terms of overall welfare is largely attributable to compliance effects, as measured by the probability of injury (Figure 2). The compliance effects are greater under the British rule because it maximizes the spread between the expected liability of guilty and innocent defendants.

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<sup>19</sup> For the simulations, I used exponential distributions for  $G$  and  $H$ , with exponential parameters  $\frac{1}{2}$  and 1 respectively. I also assumed  $p = .75$ ,  $q = .25$ .

<sup>20</sup> For a recent analysis of litigation cost allocation rules that provides an informal welfare comparison, see Van Wijck & Van Velthoven (2000).

<sup>21</sup> Under the Proplaintiff rule, the plaintiff pays his own legal costs only if he loses. Under the Prodefendant rule, the defendant pays his own costs only if he loses.

<sup>22</sup> See, e.g., Shavell (1982).

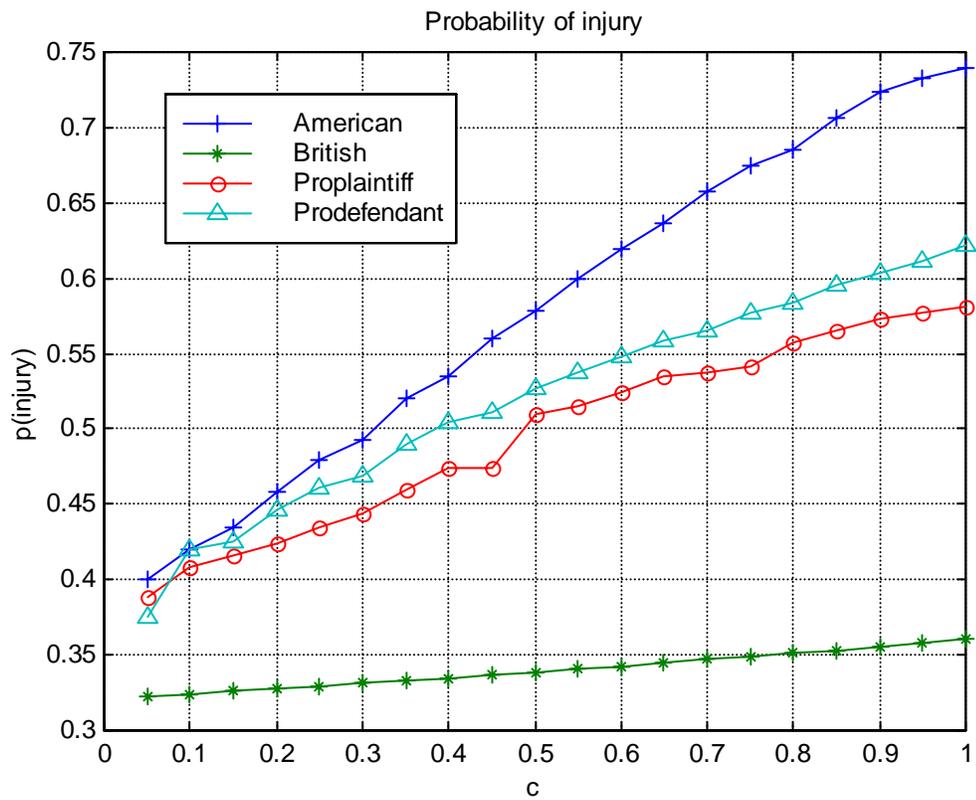


Figure 2

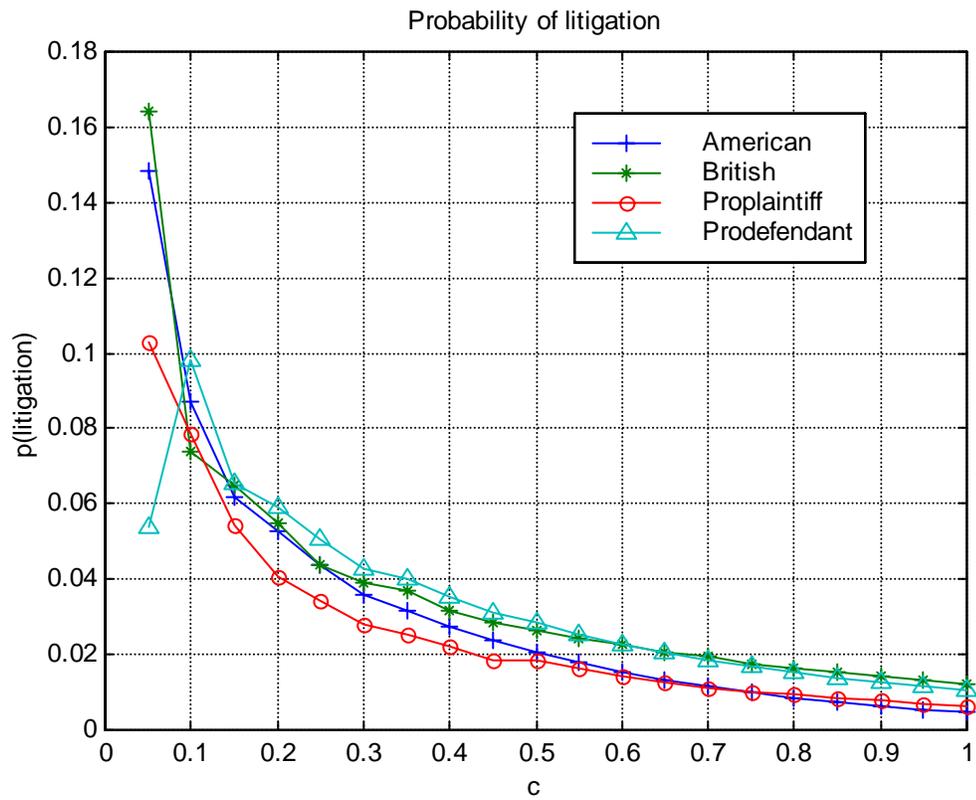


Figure 3

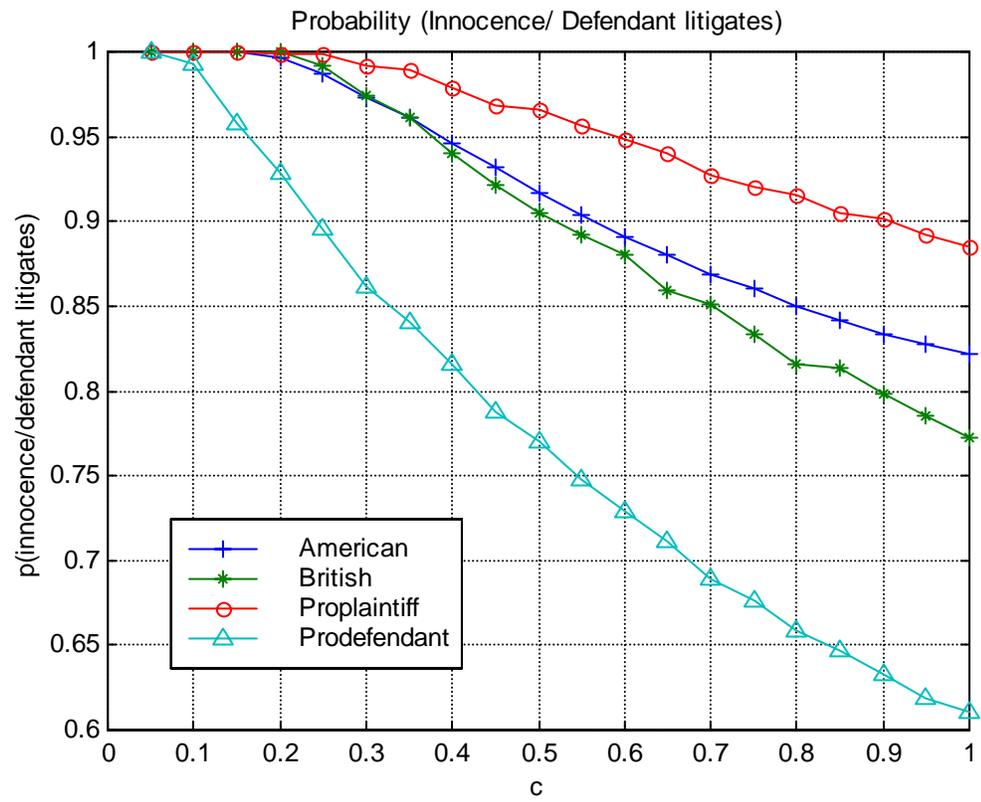


Figure 4

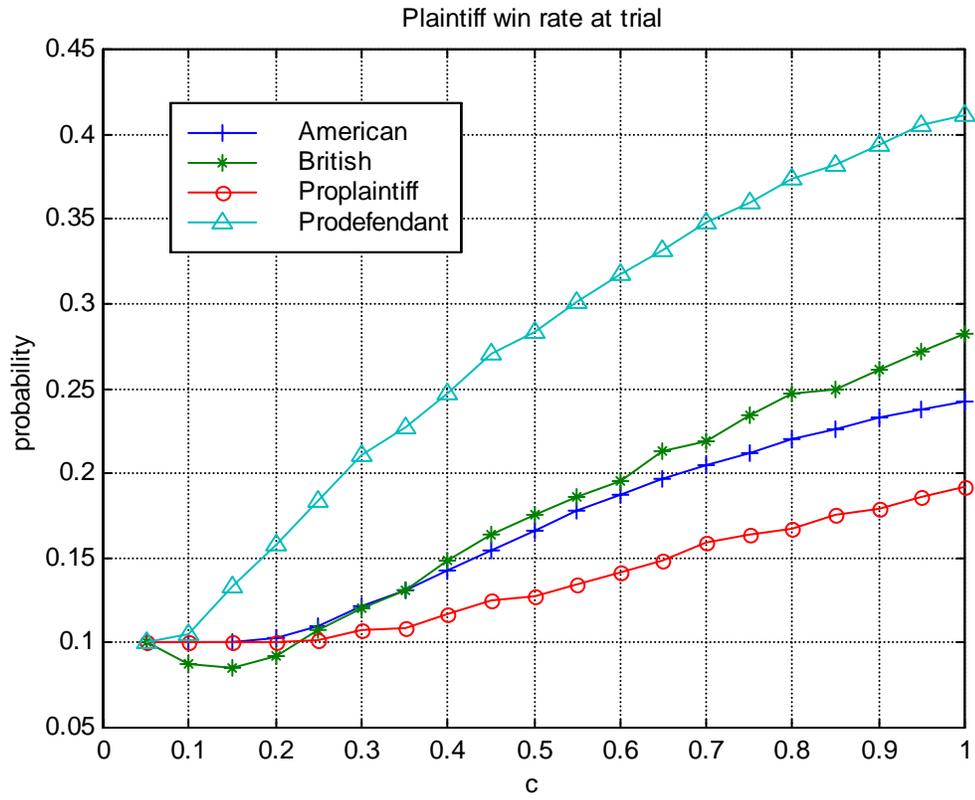


Figure 5

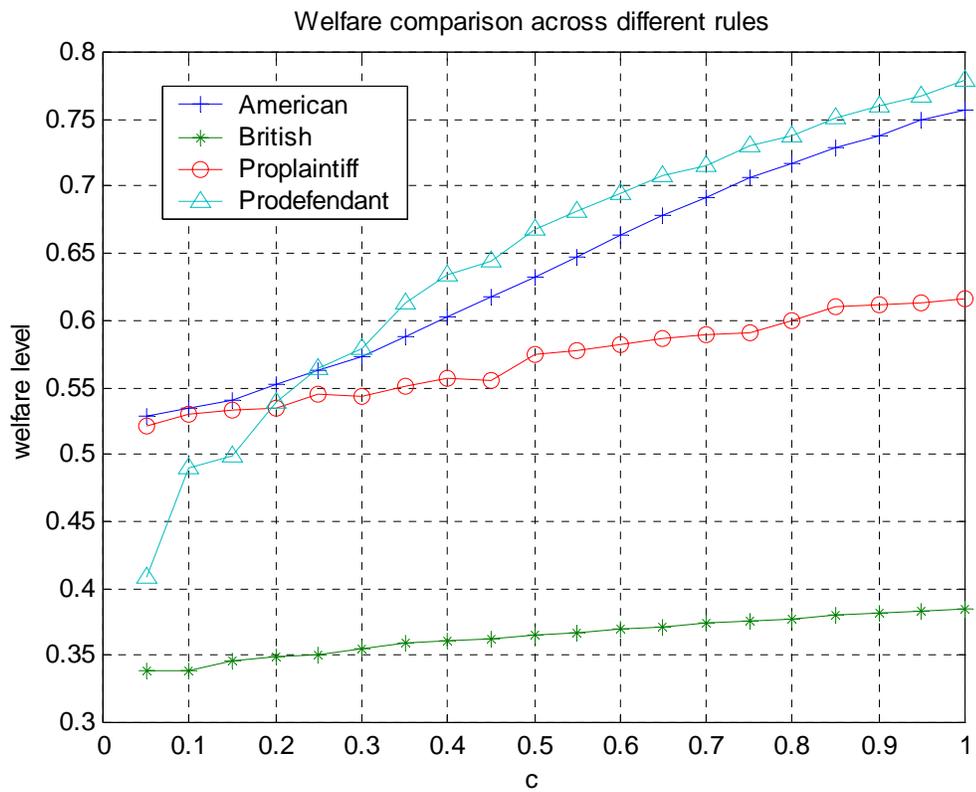


Figure 6

## **IV. SOME IMPLICATIONS**

The model in this paper combines several real-world features, such as costly litigation, the possibility of legal error, informational asymmetry, and the possibility that a dispute may settle. In this part I discuss some of the implications of these features for the literature on compliance and settlement, and for the literature on plaintiff win rates in litigation.

### **A. Incentive to Sue and Compliance**

The model extends a line of research beginning with Ordover (1978), which showed that when litigation is costly potential injurers undercomply with the due-care standard. The reason is that if suit is costly, no individual victim has an incentive to bring suit in a regime of perfect compliance (or overcompliance) because the expected award is zero. However, when one introduces judicial error into the model, perfect and overcompliance equilibria are possible.<sup>23</sup> The reason is that when courts mistakenly find parties in violation of the due-care standard (type-2 judicial error), victims will have incentives to sue even when compliance is perfect.

The first two propositions in this paper extend this line of research by examining the mechanics of litigation. Although litigation may occur when all potential injurers are complying with the due-care standard, no disputes are litigated to judgment. Suits are filed, but each plaintiff settles for an amount equal to the expected payoff to a plaintiff who

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<sup>23</sup> Hylton (1990).

sues an innocent defendant. Similarly, when no one complies with the standard, suits settle for the expected payoff to a plaintiff who sues a guilty defendant.

In terms of an empirical message, the model illustrates and extends a rather basic paradox of the litigation process. When judicial error rates are positive, the fraction of innocent defendants within the sample of those found guilty approaches one as the rate of compliance approaches one. Thus, as compliance improves the ex post or posterior rate of false convictions increases, generating complaints about the court system. Of course, this is not a surprising result, since it is an implication of Bayes' rule. However, Proposition 1 suggests that this tendency toward false convictions is even more pronounced than implied by Bayes' rule, for two reasons. First, the trial selection process tends to filter out guilty defendants. Second, as the probability of a type-2 judicial error (erroneous conviction) increases, the fraction of innocent defendants within the sample of litigants increases, further amplifying the tendency toward high ex post false conviction rates. In short, the familiar Bayesian testing paradox – applying an imperfect test to a virtually disease-free population leads to a high rate of false positives – is amplified in the litigation context by the trial selection process.

## **B. Understanding Trial Outcomes**

This model has implications for the literature on trial selection, and plaintiff win rates in particular. The model provides a more rigorous foundation for the conjecture that win rates will be less than fifty percent in regimes in which the legal test requires an

examination of the defendant's compliance and the defendant enjoys an informational advantage (Hylton, 1993a).

Generally, the model suggests that plaintiff win rates are influenced by informational advantages in litigation and by characteristics that may bias a court's decision. However, it is difficult to determine the influence of judicial bias on plaintiff win rates. To illustrate the difficulties, I consider the model's implications for two empirical findings on plaintiff win rates.

a. *Judge vs. jury win rate puzzle*

Clermont and Eisenberg (1992) report the finding that plaintiff win rates are lower in product liability and malpractice cases when the dispute is heard by a jury than when it is heard by a judge. Whether before judge or jury, the win rates reported by Clermont and Eisenberg are well below fifty percent. This goes against the common intuition that juries would provide awards to plaintiffs more readily than would judges.

The Clermont and Eisenberg results can be explained by the model in this paper. Low win rates are observed in product liability and malpractice because these are areas in which the legal test requires an examination of the defendant's level of compliance and the defendant has the informational advantage. The judge-jury win rate differences can also be explained. If the common intuition that juries tend to side with plaintiffs is correct, then trying a case in front of a judge is equivalent to reducing the probability of type-2 error. However, a reduction in type-2 error may not lead to a reduction in the plaintiff win rate, if as a result of that reduction a larger percentage of the cases heard by the jury involve innocent defendants.

What, in this model, would explain a tendency for weaker cases to be heard by juries? Suppose the pro-plaintiff bias of juries implies that  $Q_2$  rises (as a result of bias). This implies that guilty defendants would make low offers less frequently, which would result in a larger percentage of innocent defendants going to trial. The reason for this is that as  $Q_2$  increases, the probability that a plaintiff has a profitable claim against an innocent defendant increases, and as this latter probability increases, the guilty defendant's incentive to pool falls and innocents become a larger proportion of the defendants going to trial. As a result, a lower plaintiff win rate would be observed in jury trials.

There are other theories that imply plaintiff win rates will be less than fifty percent,<sup>24</sup> and therefore could be used to explain the Clermont and Eisenberg result. For example, Priest and Klein (1984) and Perloff and Rubinfeld (1987) suggest that if defendants have more at stake than plaintiffs, they will spend more on litigation. Because the stakes are asymmetric, plaintiff win rates below fifty percent will be observed. However, this thesis is hard to reconcile with the Clermont and Eisenberg findings because defendants would have the same incentive to outspend plaintiffs whether before a judge or a jury. Another theory that explains win rates below fifty percent is provided by Nalebuff (1987), which argues that plaintiffs make high settlement demands in order to maintain credibility. However, the Nalebuff theory is also hard to reconcile with the Clermont and Eisenberg result. A reduction in the probability of type-2 error should, in Nalebuff's model, cause plaintiffs to raise their demands in order to maintain credibility, which in turn would increase the percent of weak cases, further reducing the plaintiff win rate.

Relying in part on Gay, Grace, Kale, and Noe (1989), Clermont and Eisenberg explain the judge-jury win rate difference as the result of a process in which uninformed plaintiffs

with stronger cases choose judges. This is a plausible explanation but it has a key weakness: if plaintiffs have the informational advantage, one should observe win rates greater than fifty percent rather than less.

*b. Pro-cyclical employment discrimination win rates*

As a second example from the empirical literature, consider the finding that the plaintiff win rates of employment discrimination cases filed during recession are lower than those filed when the economy is strong (Siegelman and Donohue, 1995). Siegelman and Donohue argue that this is hard to reconcile with the Priest-Klein model. Under the Priest-Klein model, the plaintiff win rate should remain fifty percent, unless differences in perceived stakes vary over the business cycle.

The Siegelman-Donohue finding is consistent with the model of this paper. During recessions,  $W$ , the probability of guilt (discrimination) given injury (job termination) falls because more terminations are brought on by business conditions. In this model, a fall in the probability of guilt given an injury generally implies a reduction in the plaintiff win rate.<sup>25</sup> Unlike the Priest-Klein theory, the selection process in this model does not sever the relationship between the probability of guilt and the win rate.

Siegelman and Donohue argue that during recessions, expected damages increase because the back-pay award is linked to the plaintiff's duration of unemployment. As a consequence, plaintiffs are willing to bring weaker (low probability-of-success) cases to court. The plaintiff win rate falls, according to Siegelman and Donohue, because the Priest-Klein selection process does not work perfectly. Although they interpret their

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<sup>24</sup> For a survey and critique of alternative theories, see Hylton, 1993a.

<sup>25</sup> This point is illustrated by the model simulation results. Intuitively, as the non-compliance rate increases, we have more guilty defendants in court, unless countervailing selection effects dominate (which is unlikely, as suggested by the simulation results).

results as supporting a modified version of the Priest-Klein model, I view their results as rejecting Priest-Klein, in so far as it applies to employment discrimination cases, and providing support for the asymmetric information model.

## **V. CONCLUSION**

This paper presents a cradle-to-grave model of tort liability, incorporating the decision to comply with the due-care standard, the decision to file suit, and the decision to settle. The major implications of the model are as follows: (1) litigation to judgment occurs only in equilibria which some but not all actors comply with the due-care standard, and (2) if defendants have the information advantage at trial, plaintiff win rates will generally be less than fifty percent. A simulation of the model indicates that the British rule for allocating legal costs is superior to alternatives in terms of social welfare. In addition to these implications, the model is capable of explaining several empirical puzzles in the literature on trial outcomes.

## APPENDIX

*Proof of Proposition 1:* The proof follows Png (1987). Let the probability distributions over settlement amounts selected by the guilty and innocent defendants be given by  $\delta_{nc}(s)$  and  $\delta_c(s)$  respectively. For the innocent defendant,  $\delta_c(s) = 0$  for  $s > s_h^i = Q_2v + C_d$ . The reason is that the innocent defendant will lose no more than  $Q_2v + C_d$  at trial; therefore, he will offer no more than this as settlement. For the guilty defendant,  $\delta_{nc}(s) = 0$  for  $s > (1-Q_1)v - C_p$ . Further,  $\delta_{nc}(s) = 0$  in equilibrium for  $s > Q_2v + C_d$  except at  $s_H^g = (1-Q_1)v - C_p$ . The reason is that the guilty defendant will not lose more than  $(1-Q_1)v + C_d$  at trial. If he were to offer a settlement greater than  $Q_2v + C_d$ , he would reveal his type. But any offer less than  $(1-Q_1)v - C_p$  would be rejected, given that he's been revealed. Thus, if he reveals his type, he will offer  $s_H^g = (1-Q_1)v - C_p$ .

*Derivation of mixed strategy equilibrium:* first, consider the case where  $Q_2v - C_p < 0$ . Let  $\gamma^*$  = the probability defendant makes offer  $s^*$  lower than  $s_H^g$  and no greater than  $s_H^i$ . Let  $\theta^*$  be the probability plaintiff accepts  $s^*$ . In the proposed equilibrium, the negligent defendant is indifferent between making  $s_H^g$  and  $s^*$ , so

$$(A1) \quad s_H^g = \theta^* s^* + (1 - \theta^*)L_H$$

or

$$(A2) \quad \theta^* = \frac{C_d + C_p}{(1-Q_1)v + C_d - s^*}$$

The indifference condition for the plaintiff is:

$$(A3) \quad z(1-Q_1)v + (1-z)Q_2v - C_p = S^*$$

which yields

$$(A4) \quad \gamma^* = \frac{1-W}{W} \frac{s^* + C_p - Q_2v}{((1-Q_1)v + C_d - s^*)}$$

Given  $\theta^*$ , we solve for the value of  $s^*$  that minimizes the expected loss of the innocent defendant

$$(A5) \quad L(s^*) = \theta^* s^* + (1 - \theta^*)(Q_2v + C_d).$$

Differentiating,

$$(A6) \quad L'(s^*) = \frac{(C_d + C_p)(1-Q_1-Q_2)v}{((1-Q_1)v + C_d - s^*)^2}$$

which, increasing in  $s^*$ , implies that the innocent defendant will prefer the lowest acceptable  $s^*$ , which is  $s^* = 0$ . The expected loss to the guilty defendant is  $\gamma^* [\theta^* s^* + (1 - \theta^*)((1-Q_1)v + C_d)] + (1 - \gamma^*)(s_H^g) = s_H^g$ , which is independent of  $s^*$ . It follows that  $s^* = 0$  in equilibrium.

Now suppose  $Q_2v - C_p > 0$ . We have the same model, except that the plaintiff will reject any settlement offer less than  $Q_2v - C_p$ . Since  $Q_2v - C_p < Q_2v + C_d$ , the innocent defendant has no incentive to make an offer less than  $Q_2v - C_p$ . It follows that  $s^* = Q_2v - C_p$ .

Under passive conjectures, an offer  $s'$  lower than  $s_H^g$  but greater than  $s^*$  is assumed to occur more or less by accident, so that it reveals no new information about the

defendant. Suppose plaintiff gets an offer  $s'$  where  $Q_2v - C_p < s' \leq Q_2v + C_d$ . Under passive conjectures, the plaintiff will reject such an offer if

$$(A7) \quad W(1 - Q_1)v + (1-W)Q_2v - C_p > Q_2v + C_d$$

or

$$(A8) \quad W(1 - Q_1 - Q_2)v > C_p + C_d$$

Thus, the guilty defendant cannot gain by making such an offer (if plaintiff gets  $s' < Q_2v - C_p$  he will clearly reject as he is better off suing).

Suppose

$$(A9) \quad W(1 - Q_1)v + (1-W)Q_2v - C_p < Q_2v + C_d,$$

then plaintiff is willing to accept  $s'$  where

$$(A10) \quad W(1 - Q_1)v + (1-W)Q_2v - C_p < s' < Q_2v + C_d.$$

Is the innocent defendant willing to offer  $s'$ ? Yes, and so is the guilty defendant. But the innocent will clearly prefer  $s' = Q_2v - C_p$ , which might be rejected. The minimum offer that will be accepted is therefore  $s' = W(1 - Q_1)v + (1-W)Q_2v - C_p$ .

*Proof of Proposition 2:* Suppose all potential injurers comply, so that  $W = 0$ . Then it follows from statement (2) of Proposition 1 that all disputes will settle with a payment of  $Q_2v - C_p$  to the plaintiff. Suppose no potential injurers comply, so  $W = 1$ . If  $(1 - Q_1 - Q_2)v < C_p + C_d$ , it follows from Proposition 1 that all disputes will settle (again, see the second statement). If  $(1 - Q_1 - Q_2)v > C_p + C_d$ , then (3) implies  $\gamma^* = 0$  (recall  $W=1$ ), hence no disputes are litigated.

*Proof of Proposition 3:* Consider an increase in the defendant's cost of litigating  $C_d$ . The LPG model implies such an increase would reduce the probability of litigation. The derivative of the litigation threshold probability  $1-H(v_2)$  with respect to  $C_d$  is  $-h(v_2)/[W(1-Q_1-Q_2)] < 0$ ; thus, the “threshold effect” is, as expected, consistent with the LPG model. However, the other influences must be considered.

To simplify the argument, let  $\Psi$  equal the probability of litigation to judgment, whose full expression is set out in (7). Differentiating  $\Psi$  with respect to  $C_d$ , we have

$$(A11) \quad -h(v_2)(\partial v_2/\partial C_d)(\Psi)$$

$$(A12) \quad + (1-H(v_2))\{(\partial W/\partial C_d)[\text{Prob}(v < v_3|v > v_2)(E(\gamma^*(1-\theta^*)|v > v_2, v < v_3)) \\ - E((1-\theta^*)|v > v_2, v < v_3)) - \text{Prob}(v > v_3|v > v_2)(E((1-\theta^{**})|v > v_2, v < v_3))]\}$$

$$(A13) \quad + (1-H(v_2))\{(\partial \text{Prob}(v < v_3|v > v_2)/\partial C_d)[W E(\gamma^*(1-\theta^*)|v > v_2) \\ + (1-W) E((1-\theta^*)|v > v_2, v < v_3)] \\ + (1-W)(\partial \text{Prob}(v > v_3|v > v_2)/\partial C_d)E((1-\theta^{**})|v > v_2, v < v_3)]\}$$

$$(A14) \quad + (1-H(v_2))\{W \text{Prob}(v < v_3|v > v_2) \partial E(\gamma^*(1-\theta^*)|v > v_2)/\partial C_d \\ + (1-W)[\text{Prob}(v < v_3|v > v_2) \partial E((1-\theta^*)|v > v_2, v < v_3)/\partial C_d \\ + \text{Prob}(v > v_3|v > v_2) \partial E((1-\theta^{**})|v > v_2, v > v_3)]/\partial C_d\}.$$

The first line (A11) is the threshold effect, which is unambiguously negative (consistent with the LPG model). The second line (A12) captures the “compliance effect”, which is positive, increasing the likelihood of litigation. The third line (A13) captures the “frivolous claims effect”, and is negative because an increase in  $C_d$  makes it more likely that a claim that survives the first threshold is one which is profitable against an innocent defendant.

The fourth line (A14) captures the “strategic effect”, and is negative because an increase in  $C_d$  makes it more likely that the plaintiff will accept the low settlement offer from the defendant. The LPG model yields accurate predictions in this instance only if the threshold, strategic-incentives, and frivolous-claims effects overwhelm the compliance effect.

*Proof of proposition 4:* I must show that  $(1-W)/W > \beta_{nc}/\beta_c$  generally holds. This is equivalent to:

$$(A15) \quad \frac{1-W}{W} > \frac{\int_{v_2}^{\max(v_2, v_3)} \gamma^* (1-\theta^*) dH}{\int_{v_2}^{\max(v_2, v_3)} (1-\theta^*) dH + \int_{\max(v_2, v_3)}^{\infty} (1-\theta^{**}) dH}$$

which clearly holds for  $W \leq 1/2$ . Consider  $W > 1/2$ . The inequality A15 is equivalent to:

$$(A16) \quad 1 > \frac{\int_{v_2}^{\max(v_2, v_3)} \alpha^* (1-\theta^*) dH}{\int_{v_2}^{\max(v_2, v_3)} (1-\theta^*) dH + \int_{\max(v_2, v_3)}^{\infty} (1-\theta^{**}) dH}$$

For this to be true, it is sufficient that:

$$(A17) \quad 1 > \frac{\int_{v_2}^{\max(v_2, v_3)} \alpha^* (1 - \theta^*) dH}{\int_{v_2}^{\max(v_2, v_3)} (1 - \theta^*) dH}$$

The shape of  $\alpha^*$  is given in Figure A1 below:

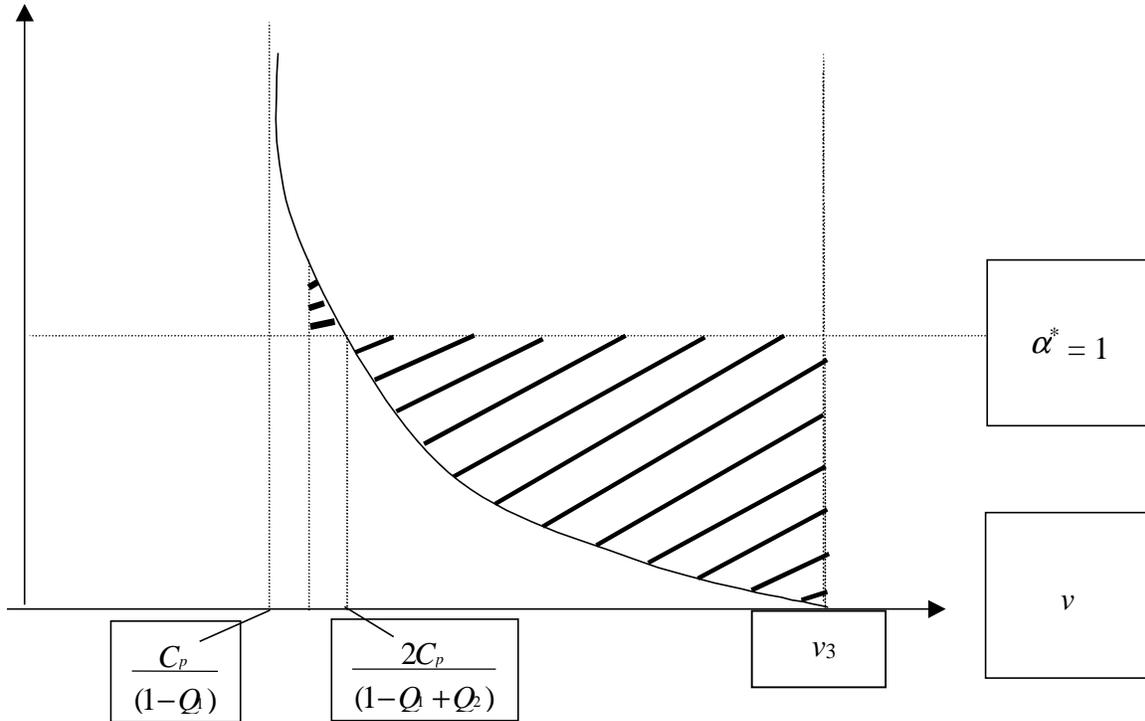


Figure A1

We need concern ourselves only with  $v$  in the range  $C_p / (1 - Q_1) < v < v_3$ . When  $v = 2C_p / (1 - Q_1 + Q_2)$ ,  $\alpha^* = 1$ . For  $v > 2C_p / (1 - Q_1 + Q_2)$ ,  $\alpha^* < 1$ , so (A17) holds. Litigation to judgment does not occur if  $v < v_2$ , where  $v_2 = (C_d + C_p) / W(1 - Q_1 + Q_2)$ . Thus, if  $(C_d + C_p) / W(1 - Q_1 + Q_2) > 2C_p / (1 - Q_1 + Q_2)$ , then (A17) holds. If  $(C_d + C_p) / W(1 - Q_1 + Q_2) <$

$2C_p/(1 - Q_1 + Q_2)$  then (A17) may not hold. The answer depends on a comparison of the shaded areas shown in figure A1, weighted by the probability masses under the density  $h$ . If virtually all of the mass is between  $(C_d + C_p) / W(1 - Q_1 + Q_2)$  and  $2C_p / (1 - Q_1 + Q_2)$  (i.e., low stakes cases) then (A17) may not hold, but this will happen only in the case of a very peculiar probability density function.

## REFERENCES

- Audrey Chin and Mark A. Peterson, Deep Pockets, Empty Pockets: Who Wins in Cook County Jury Trials. (RAND Institute for Civil Justice, 1985).
- Kevin M. Clermont and Theodore Eisenberg, Trial by Jury or Judge: Transcending Empiricism, 77 *Cornell Law Review* 1124 (1992).
- Richard Craswell, Deterrence and Damages: The Multiplier Principle and Its Alternatives, 97 *Michigan Law Review* 2185 (1999).
- Theodore Eisenberg, Testing the Selection Effect: A New Theoretical Framework with Empirical Tests, 19 *Journal of Legal Studies* 337 (1990).
- Gerald D. Gay, Martin F. Grace, Jayant R. Kale, and Thomas H. Noe, Noisy Juries and the Choice of Trial Mode in a Sequential Signaling Game: Theory and Evidence, 20 *RAND Journal of Economics* 196-213 (1989).
- John P. Gould, The Economics of Legal Conflicts, 2 *Journal of Legal Studies* 279 (1973).
- Samuel R. Gross, Getting to No: A Study of Settlement Negotiations and the Selection of Cases for Trial, 90 *Michigan Law Review* 319 (1991).
- Harvard Medical Practice Study, Patients, Doctors, and Lawyers: Medical Injury, Malpractice Litigation, and Patient Compensation in New York, The Report of the Harvard Medical Practice Study to the State of New York (1990).
- Keith N. Hylton, Costly Litigation and Legal Error under Negligence, 6 *Journal of Law, Economics, and Organization* 433 (1990).
- Keith N. Hylton, Asymmetric Information and the Selection of Disputes for Litigation, 22 *Journal of Legal Studies* 187 (1993a).
- Keith N. Hylton, Litigation Cost Allocation Rules and Compliance with the Negligence Standard, 22 *Journal of Legal Studies* 457 (1993b).
- William M. Landes, An Economic Analysis of the Courts, 14 *Journal of Law and Economics* 61 (1971).
- Russell Localio et al., The Relation between Malpractice Claims and Adverse Events due to Negligence: Results of the Harvard Medical Practice Study III, 325 *New England Journal of Medicine* 245-251 (July 25, 1991).
- Barry Nalebuff, Credible Pretrial Negotiation, 18 *RAND Journal of Economics* 198 (1987).

Janusz A. Ordover, Costly Litigation in the Model of Single Activity Accidents, 7 *Journal of Legal Studies* 243 (1978).

Evan Osborne, Who Should Be Worried About Asymmetric Information in Litigation?, 19 *International Review of Law and Economics*, 399-409 (1999).

Jeffrey M. Perloff and Daniel L. Rubinfeld, Settlements in Private Antitrust Litigation in Steven Salop and Lawrence White (editors), *Private Antitrust Litigation*, 149-184 (1987).

A. Mitchell Polinsky and Steven Shavell, Legal Error, Litigation, and the Incentive to Obey the Law, 5 *Journal of Law, Economics, and Organization*, 99-108 (1989).

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

Ivan P.L. Png, Litigation, Liability, and Incentives for Care, 34 *Journal of Public Economics*, 61 (1987).

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

Michael J. Saks, Do We Really Know Anything About the Behavior of the Tort Litigation – And Why Not?, 140 *University of Pennsylvania Law Review*, 1147 (1992).

Steven Shavell, Any Frequency of Plaintiff Victory at Trial is Possible, *Journal of Legal studies* (1996).

Steven Shavell, Suit, Settlement, and Trial: A Theoretical Analysis Under Alternative Methods for Allocating Legal Costs, 11 *Journal of Legal Studies* 55-81 (1982).

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

J. Waldfogel, Reconciling Asymmetric Information and Divergent Expectations Theories of Litigation, 41 *Journal of Law and Economics* 451-476 (1998).

Peter Van Wijck and Ben Van Velthoven, An Economic Analysis of the American and the Continental Rule for Allocating Legal Costs, 9 *European Journal of Law and Economics* 115-25 (2000).