

1982

# The Selection of Disputes for Litigation

George L. Priest

Benjamin Klein

Follow this and additional works at: [https://ir.lib.uwo.ca/economicsceapr\\_el\\_wp](https://ir.lib.uwo.ca/economicsceapr_el_wp)



Part of the [Economics Commons](#)

---

## Citation of this paper:

Priest, George L., Benjamin Klein. "The Selection of Disputes for Litigation." Centre for the Economic Analysis of Property Rights. Economics and Law Workshop Papers, 82-03. London, ON: Department of Economics, University of Western Ontario (1982).

7070

82-03

ECONOMICS AND LAW WORKSHOP  
THE SELECTION OF DISPUTES  
FOR LITIGATION

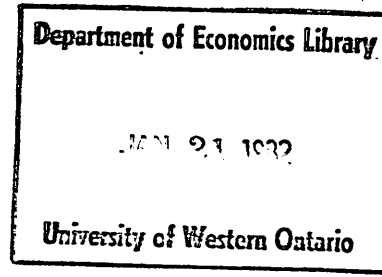
by

George L. Priest\*  
and  
Benjamin Klein\*\*

Thursday, January 28, 1982 Room 202 Law

Draft - January, 1982

NOT FOR QUOTATION OR ATTRIBUTION



Major funding for the Centre for Economic Analysis of Property Rights has been provided by The Bureau of Corporate Affairs, Consumer and Corporate Affairs, and by the Academic Development Fund, The University of Western Ontario. The views expressed by individuals associated with the Centre do not reflect official views of the Centre, The Bureau of Corporate Affairs, or The University of Western Ontario.

Subscriptions to the Workshop papers and the Working Paper Series are \$40 per year for institutions and \$25 per year for individuals. Individual copies, if available, may be purchased for \$3 each. Address all correspondence to John Palmer, Centre for Economic Analysis of Property Rights, The University of Western Ontario, London, Ontario, CANADA N6A 5C2

-1-

I. INTRODUCTION: THE PROBLEM AND SOME  
EARLIER ATTEMPTED SOLUTIONS

This paper addresses the relationship between disputes that are litigated and disputes that are settled prior to or during litigation. The specification of this relationship is important for the analysis both of the legal system and of influence of the legal system on society. Virtually all systematic knowledge of the legal system derives from studies of appellate cases. Appellate cases, of course, provide the most direct view of doctrinal developments in the law. Few scholars today, however, are content to study doctrinal developments alone without regard to the broader influence of legal rules on social affairs. And appellate cases disclose very little about the effect of the legal system on behavior.

If all disputes that occurred in a society, or even a random sample of these disputes, were tried to judgment and then appealed, one could study appellate cases to determine the range of behavior governed by legal rules. The facts of appellate cases would indicate the types of social problems that have required legal resolution. Differences over time in the types of problems appealed would show how changes in legal rules affect these problems and, thus, how rules influence behavior. It is well known, however, that a very small fraction of disputes comes to trial and an even smaller fraction is appealed. In a study of insurance company claims files, H. Laurence Ross reports that, of his sample, only 4.2 percent of

claims ultimately reached trial and .2 percent of claims were appealed.<sup>1/</sup> In a more comprehensive survey of a set of police automobile accident reports, Alfred Conard et al., found that .5 percent of accident victims pressed their claims to trial and only .09 percent of victims appealed trial verdicts.<sup>2/</sup> It is very difficult to infer specific characteristics from observations of .2 percent or less of a population, especially where there is no evidence that the observations (the disputes selected for appeal) were selected randomly.

Many legal scholars have expressed concern about the peculiar sample of cases that reach trial and appeal, but none has developed an accepted means to adjust analysis of appellate data in response to the problem. Karl Llewellyn, for example, regarded litigated cases as "pathological": bearing the same relation to the broader set of disputes "as does homicidal mania or sleeping sickness, to our normal life."<sup>3/</sup> Llewellyn attempted to obtain a broader view of the legal system from his studies of appellate decisions by disregarding leading decisions and, instead, sampling in a manner that approached randomness. Llewellyn studies "the cases in sequence as they stand in the reports" (that is, for example, the first 194 pages of New York reports from 1842)<sup>4/</sup> or decisions rendered by a court on a "single opinion-day" (that is, for example, all decisions rendered by the Pennsylvania Supreme Court on March 20, 1944).<sup>5/</sup> These decisions represented to Llewellyn "the mine-run stuff as it comes unselected from the mine."<sup>6/</sup> Llewellyn's methodological innovations, however, have not appeared attractive to modern legal scholars. More recently, Professor Whitford in a study of the impact on automobile manufacturers and consumers of

the strict liability standard, disregarded leading cases and studied every reported decision in the period 1960-76 in which auto defects were involved (including cases involving only procedural issues).<sup>7/</sup> Whitford, however, despaired of the representativeness of even a census of decisions,<sup>8/</sup> and turned to interviews with consumers, employees of dealers and manufacturers, and attorneys involved in auto litigation.<sup>9/</sup>

Most legal scholars, however, either ignore the problem of the representativeness of appellate decisions or presume representativeness. The most common presumption is that the facts of disputes that reach trial or, more commonly, appeal, resemble the facts of disputes that are settled. Professor Posner, for example, infers the efficiency of 19th Century negligence law from the observation that there are no cases within his large appellate sample in which parties to a contract agreed to a standard of liability different from the legal standard.<sup>10/</sup> Posner's conclusion requires the presumption that there are no cases involving alternative liability standards that were settled prior to appeal.<sup>11/</sup> As another example,<sup>12/</sup> it is very common for legal scholars to infer the influence of a legal standard or the attitudes of judges or juries<sup>13/</sup> towards plaintiffs or defendants by observing how often plaintiffs recover verdicts. The presumption underlying these inferences is identical. For the rate of plaintiff verdicts to be an accurate measure of the influence of a legal standard or of judicial or jury attitudes, litigated disputes must be representative of all disputes.

This paper presents a model of the litigation process that attempts to clarify the relationship between the set of disputes settled and the set litigated. According to the model, the determinants of settlement

and litigation are solely economic, including the expected costs to parties of favorable or adverse decisions, the information that parties possess about the likelihood of success at trial, as well as the direct costs of litigation and settlement. The most important assumption of the model is that potential litigants form rational estimates of the likely decision at trial employing all available information relating to the standard of decision, whether applicable legal precedent or judicial or jury bias. From this proposition, the model shows that the disputes selected for litigation (as opposed to settlement) will constitute neither a random nor a representative sample of the set of all disputes.

In particular, the standard of decision will influence only partially the observed rate of success of plaintiffs and defendants in litigation. If disputes were selected for litigation randomly, then the rate of plaintiff verdicts would differ as the standard of decision was more or less favorable to plaintiffs.<sup>14/</sup> This model demonstrates, however, that, under basic conditions the economic determinants of litigation and settlement create a strong bias toward a rate of success for plaintiffs at trial or appellants at appeal of 50 percent regardless of the substantive standard of law. Thus, plaintiff victories will tend toward 50 percent whether the legal standard is negligence or strict liability, whether judges or juries are hostile or sympathetic. The model also specifies the economic conditions that lead to rates of success for plaintiffs different from 50 percent.

Part II of the paper first presents the basic model and derives the 50 percent implication. Then, an important assumption of the

basic model is relaxed to consider the set of cases in which the stakes of the dispute are different for the parties, such as where a single consumer sues a manufacturer whose future practices will be implicated by the outcome. Part II shows that the relative stakes to the parties will greatly influence the rate of success upon litigation and is likely to be the principal determinant of rates of success that differ from 50 percent. Finally, Part III presents data evaluating the model's implications.

This Article elaborates earlier papers by one of us that described the influence of decisions to settle or litigate disputes on the formal content of the law.<sup>15/</sup> It was an implication of one earlier paper, building upon the assumption of symmetrical stakes to the parties and the 50 percent hypothesis,<sup>16/</sup> that where litigation costs are substantially greater than settlement costs, the formal legal standard of decision will be difficult to establish scientifically from observations of litigated disputes.<sup>17/</sup> Although this paper refines that implication, its principal focus is not the formal content of the law. Rather, this paper attempts to develop empirical implications of the litigation-settlement theory that are less qualitative and more easily observable, such as success rates in litigated cases.

## II. The Selection Model and Its Implications

### A. Preliminary Assumptions

#### 1) Disputes and Verdicts.

We define a "dispute" as any occasion in which a plaintiff asserts a claim for some injury against a defendant. A dispute may be resolved either by a verdict after trial or by a settlement at any time prior to a verdict. For our purposes, a dispute will be regarded as "litigated" only if a verdict is rendered; all terminations of the dispute short of a verdict are regarded as "settlements."<sup>18/</sup> All trial verdicts constitute the relevant set of disputes for appeal. We presume that the decision to appeal a trial verdict is in all respects identical to the decision to litigate a dispute.

If a verdict is rendered in favor of the plaintiff, the defendant (who is "liable") is required to pay to the plaintiff some amount called the judgment. If, in contrast, the defendant prevails at trial (a verdict of "not liable" or "no liability"), he pays nothing to the plaintiff who suffers the alleged loss without compensation. Initially, we ignore asymmetric gains to the plaintiff or losses to the defendant from a verdict. In a later section, however, we show that asymmetric returns have substantial significance for the selection process.

Finally, we assume that the distribution of initial disputes is determined exogenously and that the parties believe non-strategically with respect to litigation and settlement.<sup>19/</sup> By non-strategic, we mean that the parties behave as if their actions have no effect on



current or future actions of the other party. The model, then, may be viewed best as a one-period model of dispute resolution.

## 2. The Decision Standard

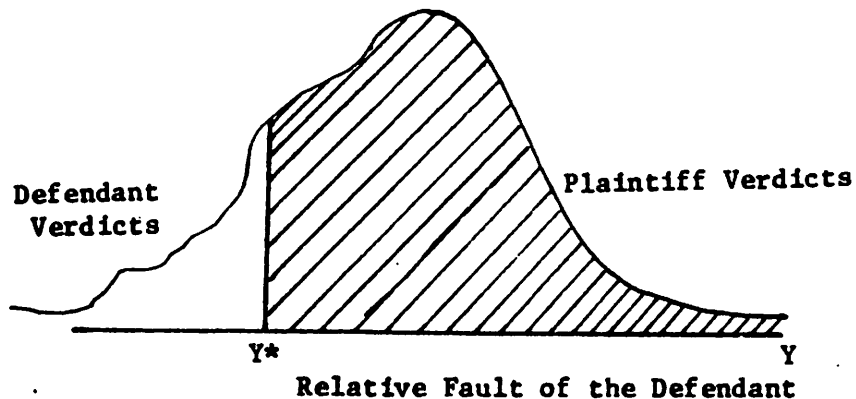
An important objective of the paper is to determine how the standard of decision at trial or appeal influences the choice between litigation and settlement. For this purpose, we will presume that standards exist for resolving disputes, and that judges or juries apply specific standards consistently in disputes of one type or another. Every decision standard relates in some way to the circumstances of the type of dispute to which the standard applies. It is not necessary to assume any particular basis for decision standards -- that is, a standard may be based on legal precedent or, say, the personal bias (for example, racial prejudice) of a judge or jury -- but only that the standard is applied consistently given the judge's or jury's understanding of the circumstances of the dispute. Thus, the trial or appellate verdict can be described as,

$$(1) \quad G = G(X), \text{ where } G = 0, \text{ if the verdict is for the defendant (no liability), and}$$
$$G = 1, \text{ if the verdict is for the plaintiff (liability),}$$

where  $X$  is a vector of circumstances or characteristics of a particular type of dispute and  $G(X)$  is the function that summarizes the application of the standard by the judge or jury to the set of characteristics. Again, it is unnecessary to assume that the function  $G(X)$  is constant across judges or juries (although we assume a standard will be applied consistently by a given judge or jury), or is independent of factors such as individual characteristics of the parties or of the judge or jury.

To illustrate our assumption of the consistent application of a decision standard, let us array a set of similar disputes, for example, automobile collisions, according to a scalar measure  $Y$  that describes the relationship between the relevant characteristics of the dispute and the decision standard. For purposes of the illustration, let  $Y$  be a measure of the relative fault of the defendant in the collision leading to the claim. Figure 1 presents a distribution of disputes incorporating every automobile collision claim. Thus,  $Y = H(X)$ , where  $X$  refers to the specific facts or characteristics of a type of dispute -- here, the facts relevant to the evaluation of the relative fault of the parties -- and  $H(X)$  represents the interpretation function of these facts to the appropriate decision standard -- that is, the judgment determining levels of fault from particular facts or circumstances. This distribution of disputes is divided into two parts at some particular value,  $Y^*$ . The shaded part, to the right of  $Y^*$ , consists of disputes in which a verdict for the plaintiff (liability) is returned; the unshaded part, to the left of  $Y^*$ , consists of disputes in which a defendant verdict (no liability) is returned. That is,  $G = 0$  if  $Y < Y^*$ , and  $G = 1$  if  $Y \geq Y^*$ .

Figure 1: Distribution of Automobile Collision Disputes



The measure  $Y$ , thus, can be interpreted as representing the propensity of a plaintiff verdict, and  $Y^*$  as the value of the set of relevant characteristics of disputes -- here, that quantum of relative fault -- just sufficient to lead a judge or jury to render a decision for the plaintiff. We assume that all plaintiffs and defendants know the decision standard  $Y^*$ .

### 3. The Formation of the Parties' Expectations

Assume that a particular dispute is randomly drawn from the distribution of disputes given in Figure 1 and that the dispute has a true propensity of a plaintiff verdict,  $Y'$ . The discovery of  $Y'$ , of course, is the principal task for the judge or jury at trial. Once the judge or jury establishes the true  $Y'$  of the dispute, the verdict for or against the plaintiff is obvious according to whether the value of  $Y'$  is greater or less than that of  $Y^*$ , the decision standard.<sup>20/</sup>

Prior to trial, however, neither litigant can know with certainty which party will subsequently prevail. Each potential litigant forms an estimate of  $Y'$  based upon his individual knowledge of the facts of the dispute and his beliefs regarding the manner in which these facts will be interpreted by the court. For several reasons, a party's estimate of the propensity of a plaintiff verdict may differ both from the estimate of the opposing party and from the true  $Y'$  value of the dispute. Some of the facts or circumstances of the dispute may not be available to one or another of the parties before trial, or may be developed in an unexpected manner during the trial itself. In addition, the parties may not be able to calculate exactly how the

decision standard will be applied to the particular dispute, that is, the form of the interpretation function,  $H(X)$ . These sources of uncertainty in the prediction of legal outcomes, of course, will be known to the parties. We assume that each party forms an estimate of  $Y$  with the understanding that there is likely to be error attending the estimate.

If we define  $\hat{Y}_p$  as the plaintiff's estimate of the propensity of a plaintiff (i.e., liability) verdict and  $\hat{Y}_d$  as the defendant's estimate of the propensity of a liability verdict, we can model expectation formation with respect to a particular dispute as

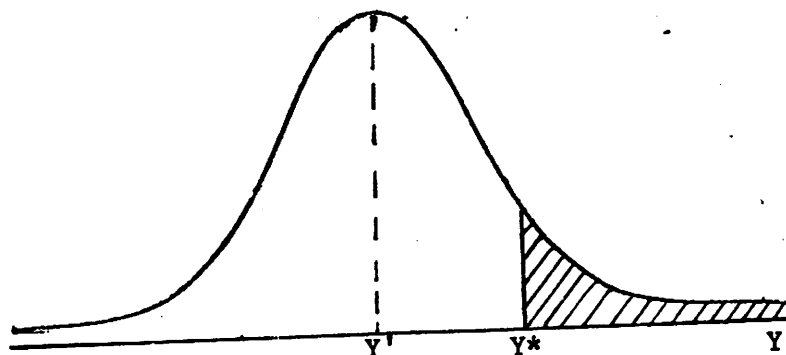
$$(2a) \quad \hat{Y}' = Y' + \epsilon_p, \text{ and}$$

$$(2b) \quad \hat{Y}'_d = Y' + \epsilon_d$$

where  $\epsilon_p$  and  $\epsilon_d$  are assumed to be independent random variables with zero expectation and identical standard errors,  $\sigma_\epsilon$ . By this formulation, we presume that each party forms an independent, unbiased estimate of the true  $Y$  of the particular dispute,  $Y'$ .

This model can be illustrated in the following way. First, assume that the particular dispute drawn from the distribution given Figure 1 has a true  $Y$ ,  $Y'$ , significantly to the left of  $Y^*$  and, thus, would generate -- if litigated -- a defendant (no liability) verdict. We assume that the sampling distributions of the estimates of  $Y$  for both parties will be centered around this true  $Y$  in the sense that their expected values (the average of the samples) will be equal to this true value --  $E(\hat{Y}_p) = E(\hat{Y}_d) = Y'$  -- and that the standard error of this sampling distribution is  $\sigma_\epsilon$ . Figure 2 represents this sampling distribution for one of the parties (the plaintiff) and the relationship of this distribution to the underlying decision standard,  $Y^*$ .

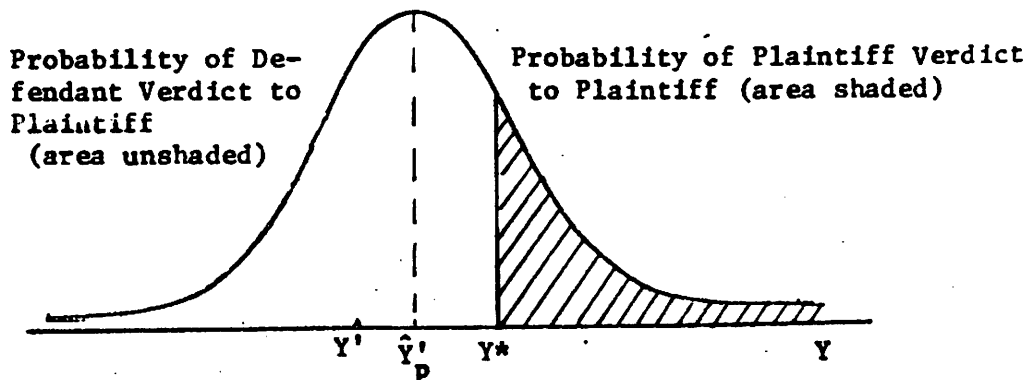
Figure 2: Sampling Distribution of Plaintiff's Estimate of the Verdict,  $Y_p$ , Conditional on the True  $Y$  Equal to  $Y'$



For the dispute considered in Figure 2, one can see that given the  $Y'$  of the dispute, it is unlikely that the plaintiff in sampling will obtain a point estimate of  $Y$  greater than or equal to  $Y^*$ . Nonetheless, it remains possible that the particular  $\hat{Y}_p$  obtained by the plaintiff is to the right of  $Y^*$ , if  $\epsilon_p$  is positive and large enough in absolute value. The likelihood that  $\hat{Y}_p$  will be greater than  $Y^*$  is indicated by the area shaded.

Assume now that the plaintiff, by sampling, obtains a point estimate of  $Y'$  for this particular dispute,  $\hat{Y}'_p$ . From his estimate of the distribution of the error term, the plaintiff will determine a confidence interval around the point estimate defining the range of estimates that include the true  $Y$ ,  $Y'$ , with any given probability. Figure 3 represents this statistical relationship for the particular case where the plaintiff happens to be estimating  $Y$  with a positive  $\epsilon_p$ , i.e.,  $\hat{Y}'_p > Y'$ .

Figure 3: Probability Distribution Around a Plaintiff's Particular Estimate of a No Liability Verdict



In Figure 3,  $\hat{Y}'_p$  indicates the mean value of the plaintiff's estimate of Y in the particular case. The distribution around  $\hat{Y}'_p$  reflects the plaintiff's estimated error in predicting Y for the dispute and, thus, his uncertainty as to the value of the true Y. The shaded area in Figure 3 represents that portion of the distribution of the plaintiff's estimate of Y that corresponds to the chance of a plaintiff verdict ( $Y \geq Y^*$ ). In Figure 3, although  $\hat{Y}'_p < Y^*$ , that is, although the plaintiff's best estimate is that the defendant will prevail, the probability that the true Y of the dispute is greater than  $Y^*$  corresponds to the probability that the plaintiff's error in estimating Y is sufficiently large that the true Y,  $Y'$  is  $\geq Y^*$ . Thus, the plaintiff's estimate of the probability of a plaintiff verdict,  $\hat{P}_p$ , is represented by the shaded area of the distribution to the right of  $Y^*$ . A distribution similar in nature could be described and a similar area defined for the defendant's estimate of the probability of a plaintiff verdict,  $\hat{P}_d$ .

To more rigorously define the area described in Figure 3, we first assume that  $Y^*$ , the value just sufficient for a plaintiff verdict, is zero. (The problem is invariant to such a normalization. It merely shifts the density of  $Y^*$  until  $Y^* = 0$ .) Therefore, each parties' estimate of the probability of a plaintiff (liability) verdict is, given his particular estimate of Y, equal to his estimate of the probability that the true Y is positive.

$$(3a) \quad \hat{P}_p = P(Y' \geq 0 | \hat{Y}'_p), \text{ and}$$

$$(3b) \quad \hat{P}_d = P(Y' \geq 0 | \hat{Y}'_d).$$

From equations (2a) and (2b), these conditional probability estimates are equivalent to the probability that the error associated with each

parties' particular estimate of a liability verdict is greater than the estimate,

$$(4a) \quad \hat{P}_p = P(\epsilon_p > \hat{Y}'_p), \text{ and}$$

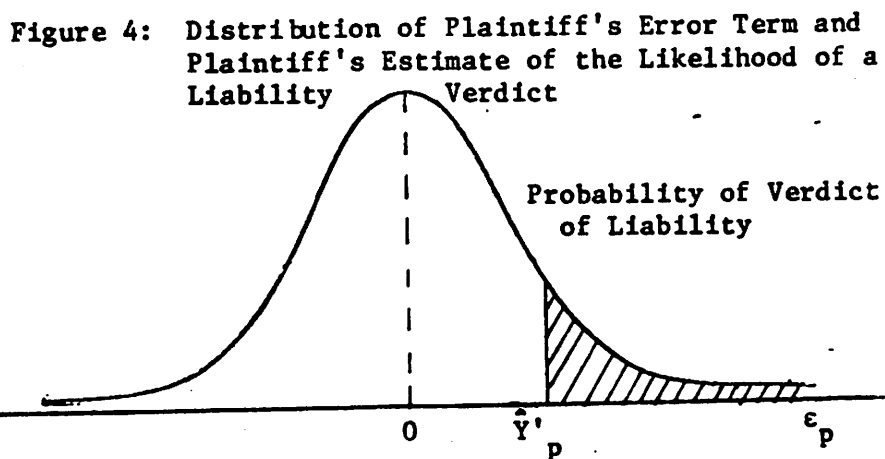
$$(4b) \quad \hat{P}_d = P(\epsilon_d > \hat{Y}'_d).$$

Hence, in this model, each party, given his particular estimate of  $Y$ , must know the distribution of the error term associated with his point estimate in order to estimate the probability of a liability verdict. If the distribution of  $\epsilon_p$  is given in Figure 4, with an assumed mean of zero and standard error  $\sigma_\epsilon$ , the probability estimated by the plaintiff of a liability verdict,  $\hat{P}_p$ , is given by the area to the right of  $\hat{Y}'_p$ , or

$$(5a) \quad P_p = 1 - F_p(\hat{Y}'_p), \text{ and similarly,}$$

$$(5b) \quad P_d = 1 - F_d(\hat{Y}'_d),$$

where  $F_p$  and  $F_d$  are the cumulative distribution functions of  $\epsilon_p$  and  $\epsilon_d$  respectively. <sup>21/</sup>



B. The Process of Selection: Equivalent Stakes to the Parties

1. Settlement Negotiation.

We shall adopt a simple formulation of the decision to litigate or settle a dispute.<sup>22/</sup> The plaintiff's minimum settlement demand (A or asking price), and the defendant's maximum settlement offer (O or offering price) may be represented as follows:

$$(6a) \quad A = P_p(J) - C_p + S_p, \text{ and}$$

$$(6b) \quad O = P_d(J) + C_d - S_d,$$

where J is the expected judgment should a plaintiff (liability) verdict be rendered;  $C_p$  and  $C_d$  are litigation costs to the plaintiff and defendant, respectively, assumed arbitrarily to be set at "optimal" levels;<sup>23/</sup> and  $S_p$  and  $S_d$  are the respective settlement costs. Note that we describe the stakes of the dispute to the parties solely in terms of the expected judgment, J. This assumption is sufficient to make the stakes symmetrical to the parties. The process of selection in the context of asymmetrical stakes will be considered in the next section. The assumption, however, implies that the verdict will have no effect on the subsequent behavior of the potential litigants themselves, and so may be particularly inappropriate with respect to the settlement of disputes considered for appeal. Note also that the assumption implies no disagreement between the parties over the amount of the judgment.<sup>24/</sup>

A sufficient condition for litigation is that the plaintiff's minimum demand (A) exceed the defendant's maximum offer (O). This condition may be rewritten from equations (6a) and (6b) as

$$(7) \quad P_p - P_d > \frac{C-S}{J},$$

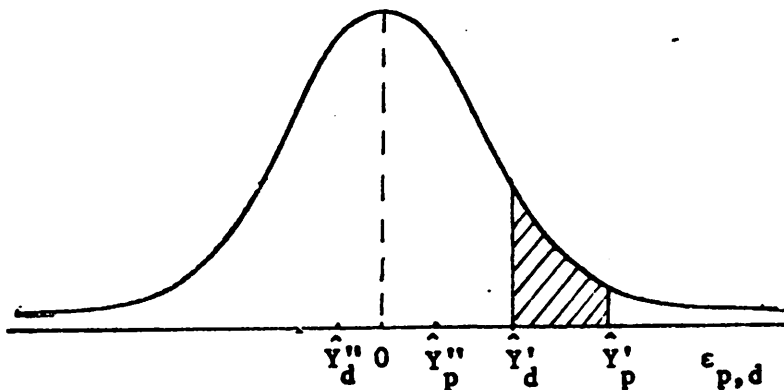


where  $C = C_d + C_p$  and  $S = S_d + S_p$ . Although not strictly necessary for the model, we adopt some further restrictions of these variables to illustrate most clearly the selection process.<sup>25/</sup> We assume that litigation costs to the parties are greater than settlement costs and, thus, that  $\frac{C-S}{J}$  is greater than zero.<sup>26/</sup> Furthermore, we assume that  $\frac{C-S}{J}$  is less than one. If  $\frac{C-S}{J}$  were greater than one (that is, if the difference between litigation and settlement costs were greater than the expected judgment), a dispute would never be litigated because  $P_p - P_d$  can never exceed 1. Thus, we let  $D = \frac{C-S}{J}$  and adopt the (reasonable) assumption that  $0 < D < 1$  in what follows. This restriction implies only that the parties can gain by settling rather than litigating a dispute and will do so unless they differ to an extent greater than  $D$  in their expectations of the outcome.

## 2. The Selection Process Described

If both parties can predict  $Y$  with equal precision (that is, equal error variance), although subject to independent errors, then, from (5a) and (5b),  $P_p - P_d = F_d(\hat{Y}_d) - F_p(\hat{Y}_p)$  where the  $F$ 's are the cumulative distributions of the two error terms. This is to say that the difference between the plaintiff's and defendant's estimates of the likelihood of a plaintiff victory relates to the difference between the error terms of

Figure 5: Differences between the Plaintiff's and Defendant's Estimates of the Likelihood of a Liability Verdict.



their estimates of  $Y$ . Figure 5 shows this difference graphically.

Figure 5 displays together the error term of the plaintiff (which was shown in Figure 4)<sup>27/</sup> and the error term of the defendant. As in Figure 4, the area to the right of  $\hat{Y}'_p$  (shaded in Figure 4, unshaded in Figure 5) represents the plaintiff's estimate of the probability of a plaintiff (liability) victory. Similarly, the area in Figure 5 to the right of  $\hat{Y}'_d$  represents the defendant's estimate of the probability of a plaintiff (liability) victory. The difference between these estimates,  $P'_p - P'_d$ , is the area shaded in Figure 5.

This formulation shows that the difference in the parties' estimates of the outcome will be related to the distance between their estimates of the  $Y$  value of the dispute and the decision standard. Areas such as that shaded in Figure 5 will be greater or less as the parties' estimate of the  $Y$  value of the dispute is closer or further from  $Y^*$ . In Figure 5, the parties' estimated  $Y'$  to lie far from the decision standard. Thus, that part of the plaintiff's error term corresponding to the likelihood of liability consisted only of the tail of the distribution, and the analogous part of the defendant's error term is only slightly larger. If the  $Y$  value of the dispute were closer to  $Y^*$  (in Figure 5, 0), however, the respective portions of the plaintiff's and defendant's error terms corresponding to the likelihood of a plaintiff verdict would be much larger. An identical difference in the parties' error would generate a much greater difference in their estimates of the outcome. Compare in Figure 5, for example, the area under the distribution bounded by  $\hat{Y}'_d$  and  $\hat{Y}'_p$ , the difference in error of which is identical to that of  $\hat{Y}'_d$  and  $\hat{Y}'_p$ . As Figure 5 shows, for a given difference in the parties' error, the difference in their expectations of the outcome is largest where  $\hat{Y}'_d$  and  $\hat{Y}'_p$  are on equal and opposite sides of 0, and decreases as  $\hat{Y}'_d$  and  $\hat{Y}'_p$

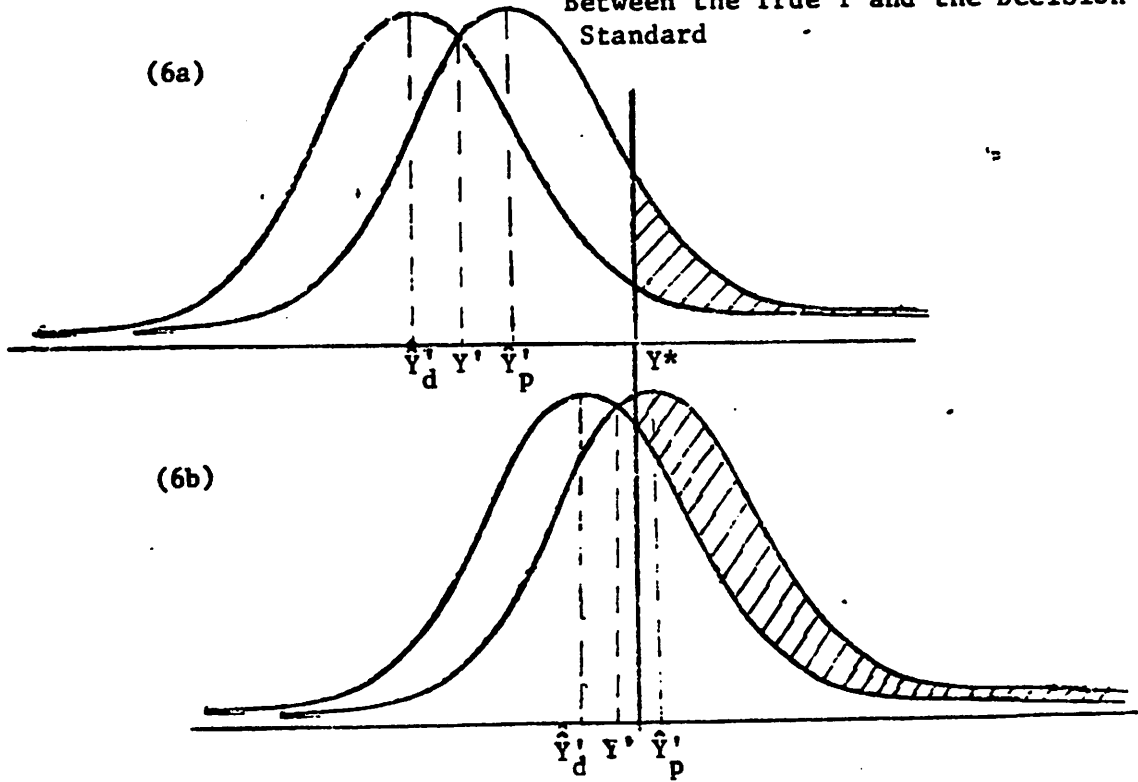
become increasingly greater than or less than 0.

It follows from our (rational expectations) assumptions that the parties' expectations are independent, unbiased, and on average equal to the true value of  $Y$ , that litigated disputes will not constitute a random sample of the underlying population of disputes, but will be concentrated among disputes with true  $Y$ 's close to the decision standard,  $Y^*$ . The distribution of litigated disputes is proportional to the product of the distribution of the population of disputes and the probability of litigation for each  $Y$ . Thus, disputes with  $Y$  values far from the decision rule are unlikely to be litigated because they are unlikely to generate differences in estimates of victory by the parties sufficient to exceed  $D$ . Put more simply, the greater the

distance that the true  $Y$  lies from the decision standard, the lower the difference is likely to be between the parties' probability estimates of a plaintiff verdict. On the other hand, the closer the true  $Y$  lies to the decision standard, the more likely it is that the parties' estimates of the outcome will differ and that litigation will occur.

Figures 6(a) and 6(b) illustrate the point by describing individual probability estimates of the parties. In the figures, the error of the parties in estimating  $Y$  is equivalent. The figures differ, however, in the distance between the true  $Y$  of the dispute,  $Y'$ , and the decision standard,  $Y^*$ . In Figure 6(a), the true  $Y$  lies far from the decision standard and in Figure 6(b), the true  $Y$  lies close to the decision standard. The probability estimates of the parties of a plaintiff victory are represented by those areas of the probability distributions of each party to the right of the decision standard. In both Figures, the difference between the area of plaintiff's and defendant's distributions to the right of  $Y^*$  -- that is, the difference between their estimates of a plaintiff verdict -- is shaded. In Figure 6(a), where the true  $Y$  lies far from the decision rule, the (shaded) difference in the parties' probability estimates of a plaintiff victory is small. In Figure 6(b), however, where the true  $Y$  of the dispute lies close to the decision standard, the (shaded) difference between the parties' probability estimates is much larger. Thus, the likelihood that the parties will litigate rather than settle the case is much larger.

Figure 6: Probability of Litigation Determined by the Distance Between the True Y and the Decision Standard



The Figure illustrates how the settlement negotiations of potential litigants select disputes for litigation. Those disputes for which the true Y value lies far from the decision standard -- whether in favor of the plaintiff or defendant -- are more likely to be settled than litigated. The difference between the parties' probability estimates of the outcome is likely to be small and, thus, the parties are more likely to be able to agree on settlement terms in order to save litigation costs. On the other hand, as the true Y value of a dispute more closely approaches the decision standard, the likelihood that the dispute will be litigated increases because the difference in the parties' probability estimates of the outcome is likely to increase. Thus, the chances diminish that terms of settlement will exist that are more attractive to both parties than litigation. It can be seen in Figure 6 that the difference between the parties' estimates of the outcome will be the greatest where the decision standard is equidistant between the plaintiff's and defendant's estimates.

The process modeled here by which disputes closer to the decision standard generate more uncertainty as to their outcomes and, thus, more disagreement between the parties explains the widespread practice of placing a betting "line" or handicap on a sporting event. A betting line for, say, a football or basketball game is the number of points that a bookie is willing to add to the unfavored team's score in order to maximize betting. Where a powerful team is scheduled to play a weak team, there may be no uncertainty as to which team will win. If the only gamble available is win or lose, bettors will have little interest in the game. However, where for purposes of the bet, a bookie adds a number of points to the weak team's ultimate score, he generates

greater uncertainty over the outcome. Though it may have been clear that the powerful team would win by some amount, it will be less clear that it will win by more than the margin offered by the bookie. Indeed, to generate the greatest interest in the game -- which is to say, the greatest uncertainty -- the bookies will attempt to offer that number of points corresponding to the exact qualitative difference between the teams.<sup>28/</sup> The bookie, thus, moves the decision standard from the basic win-lose standard of the game itself, to lie equidistant between the expected abilities of the two teams. The establishment of a handicap for a sport, such as golf or bowling,<sup>29/</sup> illustrates the same process.

In litigation, as in gambling, agreement over the outcome leads parties to drop out. There are no betting lines or handicaps for legal disputes. Plaintiffs win all or lose all.<sup>30/</sup> Where either the plaintiff has a "powerful" case or the defendant has a "powerful" case, settlement is more likely because the parties are less likely to disagree about the outcome. Settlement negotiations will most often fail, however, where the dispute, whatever the decision standard, is most problematic.

### 3. The Selection Towards 50 Percent Plaintiff Victories

The previous section demonstrated that disputes lying close to the decision standard are more likely to be litigated than settled. It follows from this demonstration that, if the distribution of Y is continuous at the decision standard, the proportion of plaintiff victories in litigated disputes will approach 50 percent regardless of the position of the decision standard with respect to the underlying distribution of disputes.

Figure 7 illustrates the point. Like Figure 1, Figure 7 represents a distribution of all disputes<sup>31/</sup> (say, auto collisions or product liability claims). Again,  $Y^*$  defines the decision standard, all disputes to the right -- if litigated -- decided for the plaintiff; all to the left, for the defendant. Obviously, if all or a random sample of disputes were litigated, plaintiffs would recover in litigation many more times than defendants. The proportion of disputes actually litigated, however, will be determined by the difference between the parties' expectations of the outcome and, thus, by the error terms of the parties' estimates of  $Y$ . As the parties' error terms,  $\sigma_{e_p, d}$ , are smaller, the proportion of all disputes litigated will decline and, in addition, the proportion of victories at litigation for plaintiffs will approach 50 percent.

Figure 7: Distribution of Disputes (Auto Collisions, Product Liability Claims)

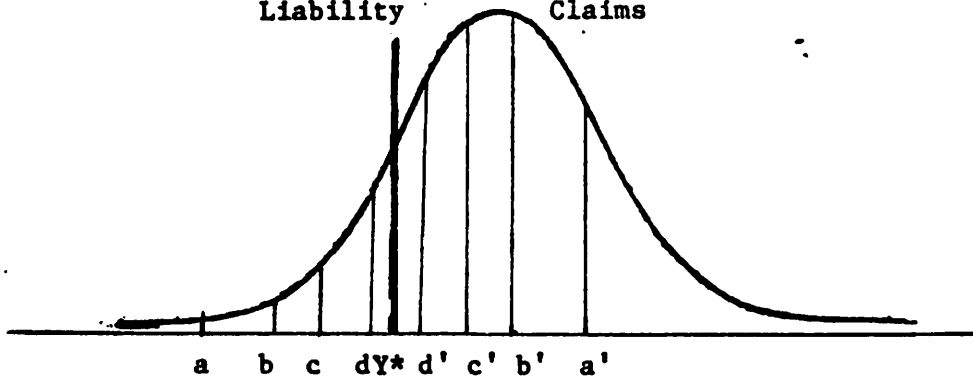




Figure 7 shows for sets of intervals (a, a'; b, b'; c, c'; d, d') around the decision standard  $Y^*$ , corresponding to different levels of the parties' error. As the parties' error terms diminish so that litigated disputes diminish from, say, interval a, a' to interval b, b', the litigation rate diminishes and the proportion of victories for plaintiffs diverges increasingly from the proportion that plaintiffs would win if all disputes within the distribution were litigated. As the error terms of the parties become very small, the area within the interval on either side of  $Y^*$  becomes more equal, and the frequency of plaintiff victories in litigation approaches 50 percent. If Figure 7 corresponded to a normal density with mean and standard deviation 1 and (a, a'), b, b'), (c, c') and (d, d') corresponded to intervals of length 3, 2, .5, and .2 respectively, then the corresponding probabilities of plaintiff verdicts would be .78, .71, .67, and .53. In the limit, as litigated disputes approach those nearest to either side of the decision standard, the proportion of victories for plaintiffs will approach 50 percent exactly.

It is important to note that the frequency of victories for plaintiffs in litigated disputes is influenced only partially by the substantive content of the decision standard. If Figure 7 describes the distribution of product liability claims, as the error of the parties diminishes and the litigation rate declines, the proportion of plaintiff victories will approach 50 percent whether the decision standard is set at a  $Y$  value corresponding to a negligence standard or moved to a  $Y$  value, corresponding to a strict liability standard. The critical determinant of litigation and of the rate of success of plaintiffs or defendants is the error of the parties in predicting  $Y$ . If the error variance in predicting  $Y$  is small

and approximately equal for the two parties, then the probability of victory will be close to .5. This condition is likely to be met if the plaintiff and defendant possess information that is on average of equal precision, and if the application of legal standards is, on the whole, coherent and predictable.

The tendency for the proportion of plaintiff (liability) verdicts to approach 50 percent as  $\sigma_\epsilon$  approaches zero can be demonstrated by, noting first, that for any given interval around  $Y^*$  (say,  $-a, a$ ) there will exist a  $\sigma_\epsilon$  small enough such that for any particular  $Y$  not in  $(-a, a)$  the plaintiff's estimate of the propensity of a liability verdict can be made less than any arbitrarily small number,  $\delta$ .

If the error term is assumed normal, the proof for this proposition is straightforward.

$$\begin{aligned}
 (8) \quad \lim_{\sigma_\epsilon^2 \rightarrow 0} P(\epsilon_p > \hat{Y}_p) &= \lim_{\sigma_\epsilon^2 \rightarrow 0} \int_{\hat{Y}_p}^{\infty} f(\epsilon) d\epsilon \\
 &= \lim_{\sigma_\epsilon^2 \rightarrow 0} \int_{\hat{Y}_p}^{\infty} \frac{1}{\sqrt{2\pi}} e^{-\epsilon^2/\sigma_\epsilon^2} d\epsilon \\
 &= \int_{\hat{Y}_p}^{\infty} \frac{1}{\sqrt{2\pi}} e^{-\infty} d\epsilon \\
 &= 0.
 \end{aligned}$$

This implies that as  $\sigma_\epsilon^2 \rightarrow 0$ , essentially all litigated disputes will come from the given interval  $(-a, a)$ .

Next, note that as the interval  $(-a, a)$  gets smaller (and  $\sigma_\epsilon^2$  also gets smaller, so that essentially all litigated cases continue to come from the  $(-a, a)$  interval), the proportion of litigated cases won by the plaintiff will move toward 50 percent. This movement is illustrated in Figure 7 by the intervals of decreasing range. More formally, the ratio

of the proportion of cases won by the plaintiff to the proportion won by the defendant is

$$(9) \quad \frac{\int_{-a}^0 f(Y) dY}{\int_0^a f(Y) dY}$$

and that

$$(10) \quad \lim_{a \rightarrow 0} \frac{\int_{-a}^0 f(Y) dY}{\int_0^a f(Y) dY} = \lim_{a \rightarrow 0} \frac{F(0) - F(-a)}{F(a) - F(0)}$$

By the Fundamental Theorem this equals  $\frac{0}{0}$ .

Using l'Hospitals' Rule,

$$(11) \quad \begin{aligned} &= \lim_{a \rightarrow 0} \frac{f(-a)}{f(a)} \\ &= \frac{f(0)}{f(0)} = 1. \end{aligned}$$

There are four separate implications of this approach. First, to the extent of the cost advantage of settlement over litigation, there will be a tendency toward a rate of success<sup>32/</sup> for plaintiffs and defendants in litigated cases of 50 percent which, in the limit, will be unrelated to the position of the decision standard or to the shape of the distribution of disputes. This implication will be refined in the next section. Second, an important determinant of the extent to which the observed success rate approximates 50 percent will be the parties' error in estimating the outcome. As the parties' error diminishes, the 50 percent proportion of victories will be approached

more closely. Since, for example, we would imagine error to diminish with experience under a legal standard, the approach would imply a progressive convergence toward 50 percent victories after a change in a rule of law. Third, the tendency toward 50 percent plaintiff victories is closely related to the litigation rate. As the parties' error diminishes, the proportion of disputes litigated declines and the proportion settled increases. Thus, other things equal, as the litigation rate declines, the proportion of plaintiff victories in litigation will more closely approach 50 percent.

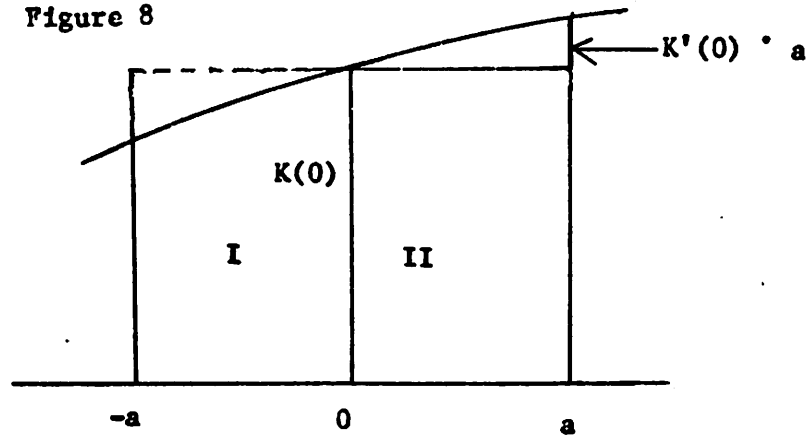
Fourth, these implications and the selection process are a function also of the other determinants of the litigation-settlement decision: litigation costs, settlement costs and the size of the judgment. These relationships are shown in equations 6 and 7.<sup>33/</sup> Other things equal, there will be greater selection by the parties -- and, thus, a lower litigation rate and a closer convergence to equivalent plaintiff-defendant victories -- where  $\frac{C-S}{J}$  is large: where litigation costs are high relative to settlement costs and where the judgment is low relative to these costs.<sup>34/</sup> To take extreme cases, where litigation costs are lower than settlement costs or where judgments are exceedingly large, all or most disputes will be litigated and the proportion of plaintiff victories will equal those of the distribution as a whole, not necessarily 50 percent. Finally, we must emphasize again that this discussion and especially the 50 percent implication derive from the assumption of symmetric stakes to the parties from litigation. This assumption is useful for understanding the selection mechanism, although when relaxed,<sup>35/</sup> some specific implications of the process -- in particular, the 50 percent implication -- are altered.

4. A Refinement of the Theory.

Although the model has demonstrated a tendency toward 50 percent plaintiff victories in litigation which is independent of the shape of the underlying distribution of disputes, the 50 percent success rate will actually be achieved only in the limit. Figure 7, supra, suggests that short of the limiting case, the shape of the dispute distribution can affect the observed success rate in a more constrained way. According to the model, given some error in the parties' estimates of  $Y'$ , an interval will exist around the decision standard which will contain a given fraction, say .95, of the set of litigated disputes.<sup>36/</sup> The range of the interval, of course, will be defined by the parties' errors in predicting  $Y$ . As the separate intervals in Figure 7 show, however, the precise rate of success in litigation will depend upon the ratio of the areas on opposite sides of the decision standard. The rate will equal 50 percent exactly only when these areas are equal.

Figure 8 illustrates more clearly how the shape of the distribution of underlying disputes in the area of the decision standard affects the success rate and the speed of convergence toward 50 percent. In Figure 8, the interval  $(-a, a)$  is determined by the errors of the parties' estimates of  $Y$  and is assumed to describe an arbitrarily large fraction of the disputes that will be litigated. Area I represents those disputes in which the defendant will prevail ( $Y < Y^*$ ); Area II, those in which the plaintiff will prevail ( $Y \geq Y^*$ ).  $K(0)$  is the height of the distribution at zero and  $K'(0)$  is the slope which for convenience we approximate as constant over the interval. The ratio of plaintiff-defendant victories at litigation is determined by the ratios of Areas II and I. In Figure 8, Area I =  $a \cdot K(0) - 1/2 a \cdot K'(0)a$ , and Area II =  $a \cdot K(0) + 1/2a \cdot K'(0)a$ .

Figure 8



The ratio of Area II to Area I is therefore equivalent to

$$(12) \quad \frac{\text{Area II}}{\text{Area I}} = \frac{a \cdot K(0) + a/2 \cdot K'(0)a}{a \cdot K(0) - a/2 \cdot K'(0)a}$$

This ratio converges to 1 (and therefore to 50 percent victories) as

$$(13) \quad \frac{\frac{K(0)}{K'(0)} + \frac{a}{2}}{\frac{K(0)}{K'(0)} - \frac{a}{2}} \text{ converges to 1.}$$

Equation (13) shows that for a given  $a$ , the greater the height of the distribution ( $K(0)$ ) relative to the slope ( $K'(0)$ ), the closer this ratio will be to 1 and the closer the proportion of plaintiff victories will be to 50 percent. Put another way, as  $K(0)/K'(0)$  increases, the slope of the distribution at the decision standard will appear relatively flatter for a given height. As a consequence, the ratio of plaintiff to defendant victories will approach one without a reduction in  $\sigma_e$ , that is without a reduction in the interval  $a$  which derives from the error of the parties' estimates. Of course, as shown before, as the error in the parties' estimates and therefore as  $a$  diminishes, regardless of the height or slope, equation (13) will approach 1.

Thus, the shape of the dispute distribution and the position of the decision standard will have some effect on the rate of plaintiff

victories in litigated disputes. There will always remain a tendency toward 50 percent plaintiff victories regardless of the shape of the distribution or the position of the standard. Thus, the proportion of plaintiff victories in litigation will always be closer to 50 percent than that of disputes within the distribution as a whole. Nevertheless, where the height of the distribution is low -- such as where a very small set of disputes occur in some area of law -- or where the slope of the distribution at the decision standard is extreme, plaintiff victories in litigation may diverge markedly from 50 percent. For normal distributions of disputes, as in Figure 7, if the decision standard intersects the distribution to the left of the midpoint -- that is, where  $E(Y) < 0$  -- the proportion of plaintiff victories will be greater than 50 percent; whereas, if the standard intersects the distribution to the right of the midpoint --  $E(Y) > 0$  -- the proportion of plaintiff victories in litigation will be less than 50 percent.

##### 5. Simulations of the Selection Model.

This section reports simulations of the model that illustrate its selection and convergence properties. Table I shows the extent to which the selection process limits the influence of the position of the decision standard. For the simulations reported in Table 1,  $Y$ ,  $\epsilon_p$  and  $\epsilon_d$  are assumed to be normally distributed with  $\sigma_Y = 1$ ;  $\sigma_{\epsilon/p} = \sigma_{\epsilon/d} = .25$ ; and  $\frac{C-S}{J} = .33.$ <sup>37/</sup>

Columns (1) through (6) demonstrate how the litigation rate and the proportion of plaintiff victories change as the decision standard is moved increasingly away from the midpoint of the distribution. Where the decision standard is set at the midpoint (column(1)), 6.3 percent of all disputes are litigated and plaintiffs win 52 percent of them.

Table 1

Simulations of the Model, Normal Distribution of Y,

Varied Locations of the Decision Standard,  $E(Y)^{*/}$

	(1)	(2)	(3)	(4)	(5)	(6)
(1) Number of Disputes	4,000	4,000	4,000	4,000	4,000	4,000
(2) Decision Standard, $E(Y)$	0	.3	.5	.7	1.0	1.5
(3) $\sigma_{\epsilon p'd}$	.25	.25	.25	.25	.25	.25
(4) % of Disputes Litigated	6.3	6.0	5.3	5.7	3.7	2.1
(5) % of Plaintiff Vic-tories in Population	49.9	39.1	30.4	24.7	16.5	7.3
(6) % of Plaintiff Vic-tories in Litigated Disputes	52.0	49.2	44.1	42.1	40.3	31.4

\*/ For all results,  $\sigma_Y = 1, \frac{C-S}{J} = .33.$



As the decision standard is moved further to the right, increasing the distance between the decision standard and a larger proportion of the distribution of disputes, the litigation rate (row 4) diminishes. Where the decision standard lies at the tail of the distribution (column (6)), only 2.1 percent of disputes are litigated.

The simulations also demonstrate the bias toward equal plaintiff-defendant verdicts. For the various positions of the decision standard, Row 5 shows the proportion of plaintiff victories if all disputes were litigated, and Row 6, the proportion of plaintiff victories in litigated disputes. Where the decision standard is set at .2 standard deviations (column (2)), plaintiffs would prevail in 30 percent if all disputes were litigated; they prevail in 49 percent of those actually litigated. Even where the standard is set at 1.5 standard deviations (column (6)), where plaintiffs would win only 7.3 percent if all disputes were litigated, plaintiffs prevail in 31 percent of those actually litigated. Although, given the extreme value of  $E(Y)$ , this proportion is significantly different from 50 percent, the bias introduced by the selection process is evident.

Table 2 illustrates the influence of different levels of error of the parties' in their estimates of the outcome on the selection process. In Table 2, the decision standard is set at two different positions: .5 standard deviations -- columns (1) through (4) -- corresponding to a plaintiffs' success rate of 30 percent if all disputes were litigated; and 1.5 standard deviations -- columns (5) through (8) -- corresponding to a plaintiffs' success rate of 7 percent if all disputes were litigated. For each of these two settings, we simulate litigation progressively diminishing the parties' error from 1 to .5 to .25 to .1 (row 3).

Table 2

Simulations of the Model, Normal Distribution of Y,  
 Varied Level of Parties' Error,  $\sigma_\epsilon$ , Given Two  
 Alternative Values of  $E(Y)^{*/}$

	(1) 4,000	(2) 4,000	(3) 4,000	(4) 4,000	(5) 4,000	(6) 4,000	(7) 4,000	(8) 4,000
(1) Number of disputes	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000
(2) Decision Standard, E(Y)	.5	.5	.5	.5	1.5	1.5	1.5	1.5
(3) $\sigma_\epsilon$ p'd	1	.5	.25	.1	1	.5	.25	.1
(4) % of Disputes Litigated	15.4	9.7	5.3	2.3	10.2	4.3	2.1	0.7
(5) % of Plaintiff Victories in Population	29.9	30.7	30.4	31.2	6.3	6.5	7.3	6.3
(6) % of Plaintiff Victories in Litigated Disputes	33.7	40.5	44.1	47.3	12.9	20.5	31.4	46.4

\*/ For all results,  $\sigma_Y = 1, \frac{C-S}{J} = .33.$

Where the parties' error in estimating  $Y$  is relatively high (for example,  $\sigma_{\epsilon} = 1$ , columns (1) and (5), the success rate in litigation is significantly different from 50 percent. The selection process still has some influence on outcomes: the success rate for plaintiffs is 34 and 13 percent in litigated disputes as opposed to 30 and 7 percent within the dispute distribution as a whole. Error values of this magnitude, however, lead to high and empirically unrealistic litigation rates: 15 and 10 percent, respectively (row 4). As mentioned earlier, the most comprehensive empirical study of dispute resolution<sup>38/</sup> found litigation rates of .5 percent at trial and .09 percent on appeal.

As  $\sigma_{\epsilon}$  is reduced, the litigation rate decreases and the proportion of plaintiff victories in litigation converges toward 50 percent (rows (4) and (6)). Even with  $E(Y)$  set at 1.5, where  $\sigma_{\epsilon} = .1$ , plaintiffs prevail in litigation 46.4 percent of the time (row (6)). Because of the low litigation rate and the limited simulation run, this result is sensitive to small random changes, but nonetheless, it illustrates the substantial power of the selection process.

### C. The Selection Process: Asymmetric Stakes to the Parties

In this Section we relax the assumption that the stakes to the parties are symmetric.

Although in cases involving legal rather than equitable remedies, the amount the loser pays is the amount the winner gains, there are many situations in which the resolution of the dispute implicates the activities or practices of one of the parties but not the other. Examples are where the

loss of a case:

- 1) damages the defendant's public reputation (or a victory restores a reputation, such as the John Connally bribery case);
- 2) influences future sales of the defendant (such as Ford's defense of the Pinto cases);
- 3) requires the defendant to change an existing practice at an increase in costs, such as where a marketing technique is held to violate the antitrust laws. 39/

To consider differential stakes, we may describe the difference between the plaintiff's settlement demand (ask) and the defendant's offer as

$$(14) A - 0 = P_p \cdot J_p - P_d \cdot J_d + S - C$$

The selectivity equation becomes:

$$(15) P_p J_p - P_d \cdot J_d > C - S.$$

Letting  $\bar{J} = \frac{J_p + J_d}{2}$  and  $\Delta J = J_d - J_p$ , this can be rewritten as:

$$(16) P_p - P_d > \frac{C-S}{\bar{J}} + \bar{P} \frac{\Delta J}{\bar{J}}$$

where  $\bar{P} = \frac{P_p + P_d}{2}$ .

It is clear that when  $\Delta J = 0$  we have  $J_d = J_p = \bar{J}$  and the selectivity equation reduces to its form in the basic model. When  $\Delta J$  is positive, that is, when the stakes are greater to the defendant than to the plaintiff, the right side is smallest where  $\bar{P}$  is small. Hence, relatively more disputes will be litigated in which the plaintiff has a small probability of winning. On the other hand, when  $\Delta J$  is negative, and the stakes are greater to the

plaintiff than to the defendant, the right side of the selectivity equation is smallest where  $\bar{P}$  is large (i.e., close to 1). Hence, more disputes will be litigated in which the plaintiff has a high probability of winning.

The implications of the analysis are that where the stakes are greater for the defendant than the plaintiff, fewer disputes will be litigated in general (because the right term of equation 16 is positive). More importantly, however, of the disputes that are litigated, more are likely to be decided in favor of the defendant. On the other hand, where the stakes are greater for the plaintiff than the defendant, the opposite consequences will follow: more disputes will be litigated and more are likely to be decided in favor of the plaintiff.

We present in Table III Monte Carlo simulations illustrating the importance of differential stakes to the parties with respect to the rate of litigation and the frequency of plaintiff verdicts. The simulations were conducted with litigation costs of 15,  $\gamma$  at 0 (the median of the normal distribution), a standard deviation of the distribution of 1, and a standard deviation of both parties' estimates of .5.

The simulations illustrate extraordinary changes in outcomes as differences in the stakes to the parties are shifted. Column 2 shows that where the stakes are heavily weighted in favor of the defendant, only 3.9 percent of disputes are litigated of which plaintiff s win 30 percent. If all disputes had been litigated, or if the stakes to the parties had been equal,

plaintiffs would have won 50 percent.

Column 3, however, presents results where the stakes are weighted oppositely

Table III: Simulations with Differential Stakes, Normal Distribution.

<u>Assumptions</u>	(1)	(2)	(3)	(4)
$\hat{J}_p$	50	50	200	100
$\hat{J}_d$	100	200	50	50
<u>Results</u>				
(1) N	4000	4000	4000	4000
(2) # of Victories in Population*	2030	2008	1963	1953
(3) # of Cases Litigated	244	156	2720	2204
(4) # of Victories in Court	82	48	1840	1658
(5) Z Litigated	6.1	3.9	68	55.1
(6) Z Victories in Population	50.8	50.2	49	48.8
(7) Z Victories in Court	33.6	30.8	67.6	75.3

\*All victories refer to plaintiffs.

in favor of the plaintiff. Now 68 percent of disputes are litigated of which plaintiffs win 67.6 percent. Of course, it should be noted that for illustrative purposes, we have exaggerated the difference in stakes between the parties. It is not the normal case in which one party stands to gain or lose four times the amount of his opponent. Furthermore, for these simulations, the litigation cost assumption is unrealistically low (at .08 or .1 compared to .3 for the simulations reported in Table I). It is this assumption that generated the unrealistically high rates of litigation where the stakes to the plaintiff were higher.

D. 50 Percent of What?

To this point, the model's implications with respect to equivalent or differential rates of success for plaintiffs and defendants have been presented without a careful definition of what types of trial or appellate victories the model can explain. A straightforward example of victory is the verdict in a case in which damages are stipulated and the issue is whether the defendant is liable or not. A significant amount of litigation, however, does not fit this characterization. Frequently, the controversy is over the extent of damages, where liability is either expressly conceded or mutually expected. Here, of course, a "victory" is represented by some numerical point along a continuum, and the simple evidence that some verdict was entered for the plaintiff has little relation to the parties' view of the outcome. Similarly, in trial cases in which the remedy is injunctive or in cases on appeal, the principal source of disagreement between the parties may be the wording of the injunction or of the controlling rule of law that the trial or appellate court will announce. Furthermore, it is artificial and, perhaps, misleading to always view the verdict as the principal subject of disagreement between the parties leading to litigation. A trial, for example, can be described as consisting

of a sequence of disputes -- over jurisdiction, over discovery, over the choice of a jury, over motions to exclude evidence or challenge testimony. In this view, the verdict itself is only the final stage, substantially contingent on the resolution of earlier issues.<sup>40/</sup>

Ours is a general model of dispute resolution and -- we believe -- explains outcomes in each of these situations, whatever the source of disagreement between the parties. For that set of litigated disputes in which the plaintiff expects a judgment of, say, \$150,000, and the defendant expects a judgment of, say, \$50,000, the model implies that, given equivalent stakes, verdicts will fall within some range with a median of \$100,000. Similarly, for disputes over the terms of an injunction or a statement of law, the model implies that, given equivalent stakes, the terms chosen by the court will be intermediate or will favor plaintiffs as often as defendants, or, given differential stakes, will tend to favor those parties for whom the stakes are greater. The model, furthermore, will explain the outcomes of preliminary, but contested, issues of procedure or substance: the relative stakes of the issue to the parties can be defined as the importance each party places on the issue relative to the remaining issues in the case.

The various types of litigation do present, of course, substantial problems of measurement. But we do not believe these problems to be insuperable. We are currently working with records of trial outcomes that include the last settlement offers of the parties prior to verdict. In addition, it may be possible to reconstruct the objectives of parties on appeal by reference to their respective briefs.



### III. An Empirical Examination of the Theory

This section presents some initial evidence bearing on the implication of the basic model that the proportion of plaintiff verdicts in litigated cases will approach .5, regardless of the standard of decision.

#### A. Civil Jury Verdicts, 1961-79, by Subject

Table IV reports the proportion of verdicts for plaintiffs in all cases tried to juries over a 19-year period, 1961-79, in the civil courts of Cook County, Illinois. The cases are arrayed in rows according to the nature of the incident giving rise to the dispute: traffic collisions (row 1), auto-pedestrian collisions (row 2), jobsite injuries (row 5), etc. Although there are many more categories of cases, we report those traffic and non-traffic categories generating the greatest volume of verdicts for the period. The Table displays the results for each of six years chosen randomly, as well as totals for the 19-year period (column 7). The numerals in parentheses under each proportion show the total number of litigated cases for the category.

One would imagine that each of the different legal subject categories describes a different distribution of disputes. Furthermore, it is not implausible that the decision standards of the various categories of disputes are loca-

ted in different positions relative to the respective underlying distributions of disputes. Certainly, the decision standards of various of the categories are different in substance. For example, in Illinois, the liability standard for automobile collisions (row 1) is ordinary negligence; for injuries to passengers of common carriers (row 3) is "the highest degree of care"; and for injuries from product defects (row 8) is ordinary negligence prior to 1965, and strict liability from 1965-79.

That decision standards are different in substance, however, does not establish that their positions relative to the underlying distributions of disputes are different. The relationship between the types of disputes that occur and a decision standard is likely to be determined most significantly by the costs to the parties of avoiding disputes (i.e., preventing the manufacture of defective products). Again, although no a priori conclusion may be drawn, it would seem the most remote coincidence for any two of the distributions of these categories of disputes to be closely similar. One may more confidently presume a difference between decision standards and the distribution of disputes where a legal standard is shifted within a given category, such as the shift in Illinois in 1965 from negligence to strict liability for product defect cases. (Product defect cases themselves, however, are analyzed more carefully, infra, )

The results of Table IV seem generally consistent with the hypothesis. The subject category with the largest number of litigated cases (auto collisions, row 1), provides strong support. In the six randomly selected years, the proportion of plaintiff verdicts in auto collision cases deviated no more than five percent from the .50 prediction. Except for Dramshop Act cases, the proportions of plaintiff verdicts in the other subject categories are more varied. Some of the variation, however, may reflect

Table IV: Plaintiff Jury Verdicts by Subject of Dispute, Cook County, Illinois, 1961-79.

	(1) 1961 X (total cases)	(2) 1962 X (total cases)	(3) 1967 X (total cases)	(4) 1973 X (total cases)	(5) 1977 X (total cases)	(6) 1978 X (total cases)	(7) All years* 1961-79 X (total cases)
<b>Traffic</b>							
(1) Auto Collision	48 (272)	49 (361)	49 (590)	45 (672)	46 (478)	45 (473)	46.6 (4225)
(2) Pedestrian	49 (57)	43 (42)	51 (100)	36 (103)	32 (65)	38 (75)	42.0 (1453)
(3) Common Carriers	44 (51)	42 (61)	51 (74)	43 (37)	68 (36)	39 (19)	49.8 (896)
<b>Non-Traffic</b>							
(4) Work Injuries	50 (20)	50 (29)	53 (52)	65 (81)	66 (31)	60 (31)	60.2 (5585)
(5) Injuries on Property	36 (46)	43 (51)	34 (81)	47 (64)	37 (46)	48 (43)	42.0 (949)
(6) Falls in Street	83 (12)	26 (21)	29 (43)	54 (25)	41 (16)	64 (25)	51.1 (416)
(7) Dramshop	39 (18)	47 (17)	46 (27)	44 (9)	47 (19)	50 (14)	50.0 (356)
(8) Product Liability	55 (11)	40 (22)	42 (26)	35 (43)	32 (73)	37 (71)	37.0 (691)
(9) Contracts, Bus. Torts	70 (5)	61 (14)	47 (15)	55 (49)	70 (74)	62 (86)	59.0 (741)
(10) Total Traffic*	48.0 (384)	47.5 (469)	49.2 (768)	44.1 (772)	45.9 (583)	44.2 (573)	47.7 (11,998)
(11) Total Non Traffic*	49.4 (162)	44.9 (217)	42.1 (323)	48.4 (377)	47.2 (361)	51.4 (399)	48.5 (5610)
(12) Composite Total*	48.4 (546)	46.7 (686)	47.1 (1091)	45.5 (1149)	46.4 (944)	47.1 (972)	47.1 (17,296)

Source: Derived from Indices, Cook County Jury Verdict Reporter, 1961-79.

NB: Deadlocked verdicts are counted as 1/2 for plaintiff.

\*Columns and rows do not sum to totals because of rounding.

the small number of observations in each subject area. For example, in 1978 plaintiffs prevailed in 64 percent of cases involving falls in streets (row 6). In that year, however, only 25 street-fall cases were litigated. If the decision in three cases had been different, plaintiffs would have won 13 cases and lost 12.

The summary of the traffic and non-traffic categories (rows 11 and 12) resolves the problem of small numbers. While these summaries, of course, tend to suppress differences between subject areas, we know of no alternative theories that would suggest suppression towards a .5 result. The summaries also support the hypothesis. With the exception of non-traffic cases in 1967, there are no observations in which the difference from .5 is greater than 6 percent. And the totals of all traffic and non-traffic cases for the 19-year period (column 7) are very close to .5.

The 19-year subject area summaries (column 7), however, reveal what appear to be significant differences from .5 in some specific subject categories, in particular: product liability, 37 percent; injuries on property (invitee, licensee cases), 42 percent; workplace injuries, 60 percent; and contracts-business tort cases, 59 percent. We discuss some potential sources of these differences in Part IV. These differences, however, are not clearly related to what one would imagine to be the predisposition of juries toward plaintiffs in these various areas. For example, one would imagine juries to be more sympathetic to victims than manufacturers in cases involving injuries from product defects. In fact, over 19 years victims prevail on average only 37 percent of the time. There appears to be no greater rate of recovery in the years following the adoption of a strict liability standard in 1965 (see columns 3, 4, 5, and 6). We will discuss the product liability data more carefully, however, infra.

B. Civil Jury Verdicts, 1960-79, by Court

Table V presents the jury verdict results from the vantage of the court in which the trial was conducted. It shows the proportion of plaintiff verdicts from 1960-79 (although some year's results were unavailable) in the Municipal, Circuit and U.S. District Courts of Cook County, Illinois. Although these are verdicts by juries rather than by judges, there is no reason to believe that the proportion of success of plaintiffs will be similar. The subject matters of the cases are different, the pool of jurors is different and the judges directing the conduct of the trials are different for the respective courts.

The results of Table V also support the hypothesis. With respect to the Municipal Courts, in 10 of 17 years, the proportion of plaintiff verdicts was within 5 percent and in 15 of 17, within 7 percent of .5. With respect to the Circuit Courts, in which more jury cases are tried and the jurisdictional limit is higher, the results are stronger. There is no year in which the proportion of plaintiff verdicts differs from .5 by more than 3.4 percent. Furthermore, in 12 of 17 years the proportion in the Superior Courts differs from .5 by less than 2 percent. There is some greater variation in the results with respect to the U.S. District Courts, although the number of jury verdicts in any single year is quite small. The total for the 17 reported years for the U.S. District Courts is within 4 percent of .5.

C. Verdicts by Individual Judges, 1960-80

The data presented above consist solely of verdicts by juries. It might be believed that jury verdicts appear even-handed because individual biases are suppressed where a 12-person jury must agree on a verdict, or because a lay jury is likely to decide cases in a roughly random manner.

Table V: Plaintiff Jury Verdicts by Court of Disposition, Cook County, Illinois, 1961-79.

Year	Municipal Courts % (total cases)	Circuit Courts % (total cases)	U.S. District Courts % (total cases)
1960	39.1 (184)	49.7 (332)	46.9 (48)
1961	43.9 (245)	48.3 (324)	54.1 (61)
1962	50.0 (244)	47.2 (534)	61.8 (55)
1963	51.3 (237)	49.4 (639)	63.3 (45)
1964	55.6 (189)	49.8 (623)	56.5 (61)
1965	52.3 (288)	52.7 (684)	45.1 (61)
1966	49.0 (353)	48.3 (736)	56.0 (50)
1967	47.9 (431)	48.5 (695)	65.3 (36)
1968	44.5 (420)	51.8 (507)	63.2 (38)
1969	46.0 (210)	51.2 (655)	42.0 (38)
1970	48.3* (121)	49.1 (612)	48.4 (31)
1971	43.1 (320)	51.8 (600)	48.7 (38)
1972	41.4 (349)	51.5 (616)	54.5 (56)
1974	43.4 (309)	53.0 (466)	55.4 (37)
1976	46.2 (198)	50.3 (522)	52.4 (21)
1978	49.4 (238)	53.4 (535)	46.4 (56)
1979	48.7 (224)	52.6 (495)	49.1 (57)
<b>TOTAL</b>	<b>46.8 (4560)</b>	<b>50.5 (9575)</b>	<b>53.4 (789)</b>

Source: Derived from Cook County Jury Verdict Reporter, 1961-79.

NB: Deadlocked verdicts are counted as 1/2 for plaintiff.

\*Suburban counties' magistrates excluded after 1969.

This subpart examines the rate of plaintiff verdicts in cases tried without juries, that is, in decisions rendered by judges. Of course, it is widely believed that the decisions of any judge reflect the judge's individual viewpoints. Indeed, important to the acceptance of this view by the Realists and others was the famous empirical demonstration of Jerome Frank in Law and the Modern Mind of significant differences between individual judges of the New York City Magistrate's Courts in criminal conviction and sentencing practices.

It is very difficult to obtain information on the decisions of individual judges with respect to specific legal categories. Table VI presents results of a (small) sample of decisions by U.S. District Court judges in negligence and contract breach cases from 1960-80, derived from Lexis. The selection of the five individual judges was not entirely random. Many District Court decisions are rendered without a formal opinion and, although there is some specialization within the federal courts, it was difficult to find individual judges who, even over a long period, had decided (and reported) large numbers of general negligence cases. The five judges were selected randomly from the set of U.S. District Judges who had decided more than 8 negligence cases in the period. The sample was later extended to consider verdicts in contract-breach cases by these same judges. The five judges are Andrew A. Caffrey (D.Mass.), Roszel C. Thomsen (D.Md.), Edward Weinfeld (S.D.N.Y.), Joseph S. Lord, III (E.D.Pa.), and Frank A. Kaufman (D.Md.). We have no specific historical, political, or psychological information about any of the judges, although we imagine that there are differences between them in some dimension.

Table VI: Plaintiff-Defendant Verdicts by  
U.S. District Judge, 1960-80.

Judge	Negligence Cases			Contract Cases		
	Total Negl.	For Plaintiff	For Defendant	Total Contract	For Plaintiff	For Defendant
Caffrey	23	9	14	12	5	7
Thomsen	15	9	6	17	9	8
Weinfeld	18	10	8	8	4	4
Lord	16	8	8	7	4	3
Kaufman	8	3	5	3	2	1
<b>Total all judges</b>	<b>80</b>	<b>39</b>	<b>41</b>	<b>47</b>	<b>24</b>	<b>23</b>

Source: Lexis, Federal Supplement 1960-80.



The results of Table VI again confirm the hypothesis. The largest difference from the .5 range appears in the negligence decisions of Judge Caffrey, although the difference may result from the small number of decisions; a shift of 2 of Caffrey's decisions would make 11 plaintiff and 12 defendant verdicts. No other judge (nor Caffrey with respect to contract breach cases) differed from the .5 prediction by more than one decision. Furthermore, the totals for the 5 judges are striking.

It might be thought that an alternative hypothesis consistent with the findings of Table VI is that these five judges are distinguished among judges by their exceptional fair-mindedness. It is, in fact, because of their unusually equitable dispositions that plaintiffs and defendants together were willing to waive juries with greater frequency before these judges than before others on the federal bench. This hypothesis, however, is identical to that of the paper. According to the theory, litigation is more likely to occur where there are relatively greater differences between the parties' expectations of the outcome. Outcomes will be hardest to predict in close cases before fair-minded judges, in the same way that it is most difficult to predict the outcome of a flip of a perfectly unbiased coin.

IV. Some Exceptions Considered: Differential Status

This Part briefly reviews evidence relating to the prediction of greater plaintiff and defendant verdicts as the stakes to the parties differ.

A. Product Liability Cases, 1959-75

Table IV showed that in litigated disputes involving injuries from product defects, plaintiffs systematically lost more often than they won. Table VII again reviews recoveries in product liability cases in jury verdicts rendered in the courts of Cook County, Illinois between 1959-75. We have studied the reports of these cases more carefully and have uncovered many more product liability cases than indicated in the sources of Table IV.

There again is evidence of a systematic difference in the rate of plaintiffs' recoveries from the .5 prediction of the basic model (although a less substantial difference than reported earlier). The yearly data also confirm that the shift in the standard of liability in 1965 from negligence to strict liability had little effect on the rate of recovery. Of cases decided under the negligence standard, plaintiffs won 42.6 percent; under the strict liability standard, 41.5 percent. These figures again confirm the implication of the invariance of the rate of recovery to the decision rule. Because of the substantial trial queue in Illinois, however, we may test the hypothesis more carefully. There were many cases filed when the

**Table VII: Plaintiff Verdicts in Product**

**Defect Cases, Cook County, Illinois, 1959-75.**

<b>Year</b>	<b>Proportion Victory %</b>	<b>Total Cases</b>
1959	38	13
1960	50	32
1961	39	51
1962	56	39
1963	40	52
1964	37	54
1965	40	58
1966	41	58
1967	42	43
1968	41	46
1969	33	48
1970	42	31
1971	26	34
1972	48	56
1973	43	47
1974	40	63
1975	52	56
<b>TOTAL 1959-75</b>	<b>781</b>	<b>41.9</b>

**Source: Cook County Jury Verdict Reporter, 1959-75.**

standard of liability was negligence but tried when the standard was strict liability. Of these cases, plaintiffs won 40.78 percent. There appears to have been a very rapid convergence of the parties' estimates of recovery.

How might we explain the systematic deviation from 50 percent recoveries? Although we have no data on which to base a judgment, it is not implausible that the stakes in product liability actions are greater, in general, to manufacturer-defendants than to victim-plaintiffs. A product-liability judgment, of course, may lead to an appeal establishing an adverse precedent. A trial court judgment may serve to support an estoppel. An adverse judgment might inform other injured parties that a case is worth bringing or increase their estimates of success and thus their settlement demands. Further, it is often alleged that firms such as insurance companies which deal over time with a substantial number of claimants invest to establish and preserve a reputation for tough bargaining to reduce further settlement demands. These are suppositions. The evidence does seem to suggest, however, that the determinant of the rate of success at trial is structural in nature, invariant over time and over changes in the standard of liability.

#### B. Resale Price Maintenance Actions, 1936-75

This subpart discusses cases in which we would expect the stakes to be higher to the plaintiff than to the defendant. Table VIII presents the outcomes of all reported private actions seeking to enforce resale price maintenance agreements from 1934-75, the period during which such agreements were exempt from the antitrust laws. Typically, these actions were brought by manufacturers against retailers who had violated agreements by selling at a price below that established by the manufacturer. They are all equit-

TABLE VIII: Resale Price Maintenance Private Actions, 1934-75.

Period	Injunction Granted % (total cases)	Contempt Order % (total cases)
1934-40	71.4 (28)	
1941-45	52.6 (19)	
1946-50	68.5 (92)	
1951-55	52.3 (193)	75.0 (8)
1956-60	57.6 (238)	61.0 (41)
1961-65	53.8 (143)	78.9 (19)
1966-70	60.6 (71)	100.0 (12)
1971-75	63.5 (63)	84.2 (19)
TOTAL	60.2 (425)	72.9 (70)

Source: Derived from CCH Trade Cases 1934-75.

able actions seeking injunctions prohibiting further violations and, in the case of second offenders, contempt orders for violations of injunctions.

The objective of these actions was general deterrence of violations. The outcome at trial was publicized in trade journals and often--it is reported--by circulars from manufacturers to the set of retailers obligated under agreements. The stakes of such actions to the manufacturer-plaintiff, thus, were likely to be substantially greater than the difference in sales to a retailer-defendant if the injunction were denied. Actions for contempt, of course, are more drastic. The relative infrequency of such actions over the period may suggest that they were brought where maintenance of prices on especially important marketing technique of the manufacturer.

Table VIII shows that the proportion of plaintiff victories was systematically greater than .5 for the period. The rate of success in contempt actions was greater yet. Contempt is often regarded as following automatically from the violation of an injunction. We see, however, that over the period contempt orders were denied in 27 percent of cases. An explanation for the result is that the rate of success at trial reflects the differential stakes to the parties.

## References - I

\* Professor of Law, Yale University. Support for my work was provided by the Institute for Civil Justice, The Rand Corporation, for which I am very grateful. I wish to thank participants of workshops at the Institute for Social & Policy Studies, Yale University, the Harvard and University of Chicago Law Schools, and the Wharton School of Finance for helpful comments on an earlier draft. I also am grateful to Jean Gold, Richard Gruber, Wayne Jones, Mary Kloefer, William Lundquist, Kenneth Landau, Anthony Leavy and Carol Maue for valuable assistance in the compilation of the various data presented here.

\*\* Professor of Economics, University of California, Los Angeles. The authors are grateful to Kevin M. Murphy for substantial assistance in the formulation and proof of the model.

1. H. Laurence Ross, Settled Out of Court at 216 (1970).
2. Alfred Conard, et al., Automobile Accident Costs and Payments (derived from) 155, 241 (1964).
3. Karl N. Llewellyn, The Bramble Bush 58 (1960).
4. K. N. Llewellyn, The Common Law Tradition -- Deciding Appeals 6, 64-68 (1960).
5. Id. at 92-96.
6. Id. at 6.
7. William C. Whitford, "Strict Products Liability and the Automobile Industry: Much Ado About Nothing," 1968 Wisc. L. Rev. 83, 102-03. For other surveys of a universe of appellate decisions, see Richard A. Posner, infra, n. 9, and G. L. Priest, infra, n. 11.
8. Id. at 103-04.
9. Id.
10. Richard A. Posner, "A Theory of Negligence," 1 J. Leg. Stud. 29, 74 (1972).
11. There may have been no litigated cases because it was clear to the parties that courts would give effect to voluntary agreements, because the standards drafted by the parties were unambiguous, or because no party found worthwhile appeal of a trial court decision involving such an agreement.

29. Golf or bowling handicaps represent a number of strokes or pins, subtracted or added to player's actual score. A handicap is set by taking an average of past performances of a player in relation to some basic standard. Thus, when the handicap correction is made, players of unequal ability can compete fairly.
30. We abstract here from a comparative negligence regime.
31. Unlike Figure 1, however, Figure 7 is drawn as a normal distribution arbitrarily, in order to demonstrate numerically below the parameters of the selection process.
32. We define "success" in litigation, infra, pages \_\_\_\_.
33. Supra pages \_\_\_\_\_.
34. These relationships are discussed in more detail in Priest, Selective Characteristics at pages 417-20.
35. Infra pages \_\_\_\_\_.
- 36.
37. The amount of the most common contingency fee in personal injury litigation.
38. Conard, et. al., supra, note 2.
39. Differential stakes to the parties may also arise in cases of differential risk aversion or where one of the parties is motivated by spite.
40. Many cases are "settled" after trial has begun, of course, because of the resolution, prior to a verdict, of these sources of disagreement.