ALTERNATIVE DISPUTE RESOLUTION: AN ECONOMIC ANALYSIS

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ABSTRACT

When parties need to resolve disputes, they may often turn not only to trial before courts but also to alternative methods of dispute resolution (ADR), such as arbitration. This article examines why parties make use of ADR and what the social interest is in ADR. A basic distinction is drawn between ex ante ADR arrangements (made before disputes arise) and ex post ADR agreements (made after disputes arise). The private advantages of ex ante ADR agreements are identified. Because such agreements raise parties' well-being, the agreements should ordinarily be legally enforced. But there is no general call for ex ante ADR to be aided by the state. Ex post ADR agreements are somewhat different, in part because parties do not take into account how such agreements will affect their prior behavior. Hence, the agreements do not necessarily advance parties' welfare and, as with ex ante ADR, there is no general basis for public support of ex post ADR.

WHEN parties need to resolve a dispute, they may often turn not only to the state-sanctioned method of dispute resolution—trial before a court—but also to alternatives, notably, to arbitration, abbreviated trial procedures, or mediation. Although particular methods of alternative dispute resolution (which will be referred to collectively as ADR) vary from one another, they share the feature that a third party is involved who offers an opinion or communicates information about the dispute to the disputants.[1] In addition, the formality, length, and complexity of ADR are usually less than those of official proceedings.

Interest in ADR has grown over the years, and today utilization of ADR is widespread. Moreover, ADR is increasingly encouraged by courts and legislation; in various areas of dispute, plaintiffs and defendants are re-

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[1] Negotiation is distinguished from ADR in that it does not involve a third party.

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quired to use ADR before they are given recourse to trial.[2] Alternative dispute resolution is now part of the law school curriculum; casebooks on ADR have been published; and journals devoted to it have been established.[3] Indeed, the group of lawyers, arbitrators, academics, and jurists fostering ADR has taken on some of the aspects of a social movement.

Why, exactly, is ADR employed? What are its advantages to private parties and to society? Should ADR be subsidized, provided, or mandated by the state? In examining these questions in this article, I apply the economic approach in that I assume that parties take rational account of the effects of ADR on the likely disposition of their disputes, and for clarity I consider stylized models of parties' behavior.[4] I make a basic distinction in the analysis between ex ante agreements to employ ADR—arrangements made before disputes arise—and ex post resort to ADR—use of ADR after disputes have arisen.

Ex ante ADR agreements are treated in Section I of this article. Here, ADR may be adopted because it is to the mutual benefit of the parties to a contract or to those who have some other relationship with each other. Three reasons why ADR may be mutually beneficial are discussed. First, ADR may lower the cost of resolving disputes or risk. Second, ADR may engender superior incentives through greater accuracy of result or other characteristics. Suppose, for instance, that substandard performance of a contract would be correctly assessed by expert arbitrators under ADR but not by courts. Then the parties to the contract might well prefer to adopt ADR because it would induce good performance, thereby raising the willingness of the promisee to pay for the contract. Third, ADR may result in improved incentives to engage in disputes or to refrain from that. For example, it may be that the number of disputes brought under the legal process would be excessive, dissipating substantial resources of the parties without instigating mutually desirable changes in behavior;

[2] Mandatory nonbinding ADR, referred to as "court-annexed" ADR, is currently a feature of certain types of civil adjudication in over twenty states; see Susan Keilitz, Geoff Gallas, & Roger Hanson, State Adoption of Alternative Dispute Resolution: Where Is It Today? 12 St. Ct. J. 4 (1988). In addition, court-annexed ADR programs have become prominent in the federal district courts, authorized by the Court Reform and Access to Justice Act of 1988, the Civil Justice Reform Act of 1990, and the Access to Justice Act of 1992.

[3] American Bar Association, Directory of Law School Dispute Resolution Courses and Programs (1989), describes ADR in the law school curriculum. A major casebook on ADR is Stephen B. Goldberg, Frank E. A. Sander, & Nancy H. Rogers, Dispute Resolution: Negotiation, Mediation, and Other Processes (2d ed. 1992). Journals on ADR include Alternatives, Arbitration Journal, Journal of Dispute Resolution, Mediation Quarterly, and Negotiation Journal.

[4] Formal analysis is contained in the Appendix.

thus an ADR agreement that would serve to limit the number of disputes would be advantageous.

Such benefits of ex ante ADR agreements cannot generally be obtained by means of ex post agreements to use ADR. Where courts are not able to ascertain substandard performance and this occurs, the parties will hardly have any reason at that point to adopt ADR—it will be too late to induce good performance. The advantages of ex ante ADR agreements, combined with the frequent inability to secure them through ex post ADR agreements, explain why parties will often want to make ex ante ADR agreements.

Because ex ante ADR agreements made by knowledgeable parties raise their well-being, the agreements raise social welfare (in the absence of external effects). Thus, it is suggested that ex ante ADR agreements should ordinarily be enforced by the legal system.[5] At the same time, there is no general call for ex ante ADR to be subsidized or otherwise aided by the state.

Ex post ADR agreements are considered in Section II of this article. Parties will tend to make ex post ADR agreements when, after a dispute arises, ADR would produce mutual gains. This can come about in two major ways: through promotion of settlement, and through reduction of dispute resolution costs. To determine how ADR functions in these respects, I append ADR to the standard economic model of litigation. Specifically, I assume that a potential plaintiff decides whether to sue, and if so, he either goes immediately to trial, agrees to a settlement, or engages in binding or nonbinding ADR. Alternative dispute resolution is assumed to be cheaper than trial and possibly to convey information about what would occur at trial. Two ADR regimes are studied: where the use of ADR is voluntary, and where nonbinding ADR is required before there can be a trial.[6] I compare outcomes in these regimes with that where ADR is unavailable.

The main descriptive conclusions are readily summarized. First, the tendency to bring suit is not affected by ADR where its use is voluntary. A person will bring suit in the model only if he has a credible threat to proceed thereafter. If ADR is voluntary, the defendant can always refuse to engage in ADR, so that the plaintiff must be willing to go to trial to have a credible threat, which is exactly his situation in the absence of

[5] In fact, ex ante agreements to engage in arbitration are generally enforceable. Further, arbitration awards are enforceable if confirmed by courts, and courts may refuse to confirm arbitration awards only under limited circumstances. See Goldberg *et al.*, *supra* note 3, at 201–2.

[6] Such mandated nonbinding ADR is widely employed as mentioned in note 2 *supra*.

ADR. When, however, nonbinding ADR is required before trial, the situation is altered. For example, since ADR is cheaper than trial, it may be that a party who would not be willing to go to trial would be willing to engage in nonbinding ADR and thus to bring suit. But it may also be that the tendency to sue would be decreased because, to go to trial, a party must incur ADR costs plus trial costs rather than just the latter.

Second, given that suit has been brought, the availability of ADR tends to reduce the frequency of both trial and of immediate settlement. Being a kind of substitute for trial and being cheaper than trial, parties may elect ADR rather than go to trial. Similarly, parties may elect ADR rather than settle since ADR constitutes an inexpensive form of legal combat; the costs of ADR are lower than those of trial and may not be high enough to discourage the parties from use of ADR. It will be seen in the analysis that these conclusions, along with those concerning the election of binding versus nonbinding ADR, depend significantly on how well ADR predicts trial outcomes.

Following the descriptive analysis of ex post ADR, I consider its private and social value. I observe that the private value of ex post ADR does not incorporate its incentive effects on parties' behavior; only ex ante ADR agreements reflect incentive effects. Consequently, it is not clear in principle that even voluntary ex post ADR agreements enhance individuals' welfare, and there is no apparent basis for the state's requiring nonbinding ADR before trial. (Indeed, such mandatory ADR can have the perverse effect of increasing the cost of litigation, by adding another layer to it, without promoting settlement.) This raises questions about the general wisdom of public policies requiring or otherwise furthering use of ADR.[7]

[7] Although this article contains, to my knowledge, the first economic model of ADR that aims at reasonable comprehensiveness, there exist two prior economically oriented articles dealing with aspects of ADR. Richard A. Posner, The Summary Jury Trial and Other Methods of Alternative Dispute Resolution: Some Cautionary Observations, 53 U. Chi. L. Rev. 366–93 (1986), contains a suggestive discussion of, and data on, the summary jury trial, in essence a form of nonbinding ADR required before trial. He emphasizes that the summary jury trial may promote settlement by promoting a convergence of beliefs of the litigants and notes, among other things, that this could increase the volume of suits and thus the number of trials. Lisa Bernstein, An Economic Analysis of Federal Court-annexed Arbitration (unpublished manuscript, Boston Univ. Law School 1993), is a detailed, mostly informal (but see note 23 *infra*) study of federal programs requiring nonbinding ADR prior to trial. In the main, Bernstein emphasizes issues different from those here (notably, fee-shifting features of ADR programs, and how required nonbinding ADR may or may not cure problems of nuisance suits); as I am, she is skeptical about the need for required nonbinding ADR.

It should also be mentioned that there exists a literature on the economics of arbitration; see, for example, Henry S. Farber, An Analysis of Final-Offer Arbitration, 24 J. Conflict Resolution, 683–705 (1980); and Orley Ashenfelter & David E. Bloom, Models of Arbitrator Behavior: Theory and Evidence, 74 Am. Econ. Rev. 111–24 (1984). Articles in this literature

I. Ex Ante Agreements to Use Alternative Dispute Resolution

A. Ex Ante Alternative Dispute Resolution Agreements and Mutual Benefits

Suppose that two parties are in contact with each other before adverse events that could lead to legal disputes arise. The parties might be in a contractual relationship (including that between employer and employee) and be considering the problem of inadequate performance or breach. Or the parties might not be in a contractual relationship but nevertheless recognize the possibility of outcomes that would cause legal disputes. For example, a factory and nearby residents might recognize that accidents are likely to occur in which the residents would be harmed (say by truck traffic from the factory). Such parties would tend to adopt ADR if it would lead to mutual advantages. Let us now briefly consider the three sources of mutual advantage mentioned in the introduction.

B. Reduction in Dispute Resolution Costs or in Risk

If adoption of ADR would lead to a reduction in the total costs to the parties of dispute resolution, then it would obviously be in their interests to make an ex ante ADR agreement. If, for example, the costs for each party were reduced by one-third in every dispute, then they each would want to employ ADR, other things being equal. Note, though, that in principle the parties would not need to make an ex ante agreement to obtain the one-third reduction in costs. They can wait until disputes arise and then adopt ADR and still reduce their costs by one-third. Thus, while reduction in costs is an advantage of ex ante ADR agreements, it is equally an advantage of ex post ADR agreements.

Similarly, if ADR would lower the risks attending disputes (because, for instance, exposure to unreliable jury verdicts could be avoided), the parties would tend to find ADR mutually beneficial if one or the other is risk averse. And, as with cost reduction, this benefit can be obtained by parties after disputes arise, so that it is a source of advantage for both ex post and ex ante ADR agreements.

C. Improvement in Incentives

A different way in which ADR may be of aid to parties is that it may induce a change in behavior that benefits both, by increasing the joint

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consider arbitration alone, not the relationship between it and litigation, which lies at the heart of this article.

value that their relationship produces. Amplification of the example of arbitrators who can discern substandard contractual performance will illustrate this.

EXAMPLE 1. Suppose that the value of good performance to a contract buyer is $1,000 and the cost to a contract seller of supplying it is $400, while the value of substandard performance to the buyer is $500 and the cost of supplying it is $300. Then the joint value of the contract to the parties is only $200 if performance is substandard, for $500 − $300 = $200, but the joint value is $600 if performance is good, as $1,000 − $400 = $600. Hence, the parties would both prefer good performance. Assume, for instance, that the contract price is such that they split their joint value. Then if performance is substandard, the price would be $400, the seller's benefit would be $100 (namely, $400 − $300), and the buyer's benefit would also be $100 (that is, $500 − $400). But if performance is good, the price would be $700, and the seller's benefit would be $300, as would the buyer's.

Suppose too that the courts are unable to detect substandard performance, while ADR-designated arbitrators can.[8] Then without ADR, performance would be substandard since the seller could always save $100 by adopting substandard performance.[9] But with ADR, good performance could be induced by the threat of the seller's having to pay damages if substandard performance were detected, which it would be. Hence, the parties would be better off with ADR—each would obtain a benefit of $300 rather than $100.

In this example, the reason that ADR led to improved incentives was that under it the quality of performance was assessed better than it would be in court. More generally, ADR could lead to improved incentives for other reasons, such as that a different legal rule is employed from that which would be applied in court. As long as ADR leads to changes in behavior that raise joint value for parties, there will be a mutually beneficial agreement that they can make involving ADR rather than the legal system.

It should be emphasized that, as a general matter, ADR that improves incentives must be agreed to ex ante because the parties would not obtain joint benefits from an ADR agreement ex post. In example 1, were performance substandard, there would obviously be no joint advantage to be gained by adopting ADR. At that juncture substandard performance has occurred, it is too late to affect incentives to induce good performance.

[8] Assume too that dispute resolution is costless in order to focus on the effect of ADR on incentives.

[9] Assume that the seller does not have a reputational interest in good performance. (Of course, were he to have such an interest, there would be no need for contracts or ADR in the first place.)

D. Beneficial Changes in the Frequency of Disputes

A third route by which ADR may produce gains for the parties is by bringing about a change in the frequency of disputes. It could be that, given the applicable law, too many actions would be brought in the sense that they would absorb resources in the form of dispute resolution costs but not produce any (or, more generally, much) benefit in behavior. In such a case, the two sides would elect to make an ADR agreement that reduces the frequency of disputes.

EXAMPLE 2. Suppose that strict liability for product defects applies, that a defect would result in a loss to a contract buyer of $1,000, but that there is nothing the contract seller can do at reasonable cost to reduce the incidence of defects. Assume too that suit can be brought at a cost of $100 and that defense costs would be $150. Consequently, whenever a defect occurs, the buyer will bring suit—$100 is less than the $1,000 he could collect—so the two sides will incur $250 in costs (or, if they settle, they will bear positive settlement costs). Yet by assumption these expenditures will not alter the incidence of defects. Hence, the parties would prefer to make an ADR agreement under which suits for defects are not brought. They could, for instance, agree to bar suits for defects or adopt the negligence rule rather than strict liability. (If they did the latter, the seller would never be found negligent since he can do nothing do avoid defects; thus suits would not be brought.)

Observe as well that the parties must make an ex ante ADR agreement to reduce the frequency of disputes. They will not make an ex post ADR agreement; their whole problem is that, if they wait until a dispute arises, the harmed party will have a reason to bring an action.

While in the above example the problem was that too many suits would be brought in the absence of ADR, another possibility is that the frequency of disputes would be too low in the absence of ADR, in that more actions would improve incentives and increase joint value by an amount exceeding the change in dispute resolution costs.[10] And here, too, only an ex ante ADR agreement would be helpful to the parties.[11]

[10] Suppose that the situation is as described in the previous example, except that the risk of defects can be cured by a trivial expenditure by the buyer and that the cost of suit would be $1,500. Then in the absence of an ADR agreement, actions would not be brought, as the buyer would not have a credible threat to bring a suit ($1,500 exceeds the $1,000 that he could collect). Hence, the trivial expenditure that could eliminate defects would not be made. An ADR agreement that encouraged suit (for example, by subsidizing it), however, would be beneficial. The prospect of suit would induce the buyer to make the small expenditure to eliminate defects. This in turn would mean not only that there would be no losses to the buyer from defects, it would also mean that there would be no disputes and no dispute resolution costs.

[11] The point of this subsection is logically equivalent to the conclusion that the private incentive to bring suit when a dispute has arisen is not aligned with the social incentive to bring suit. This notion is developed generally in Steven Shavell, The Social versus the Private Incentive to Bring Suit in a Costly Legal System, 11 J. Legal Stud. 333 (1982).

E. Ex Ante Alternative Dispute Resolution Agreements and Social Policy

When parties elect to use ADR, they are both made better off, so that social welfare must rise, other things being equal. Accordingly, the general policy of the law should be to enforce ex ante ADR agreements.[12] This statement is, of course, subject to the two usual qualifications about the desirability of enforcement of any agreements. First, it may be that a party to an agreement was not properly informed about relevant information—in the present context, information about the legal process or the character of ADR. Second, it may be that an agreement to use ADR would negatively affect third parties.[13] Either problem could provide grounds for not enforcing an ex ante ADR agreement.

Although the state should enforce private ADR agreements, this does not imply that it should subsidize or otherwise actively encourage ADR agreements. No general basis for such a policy is evident. But, again, this statement is subject to two standard qualifications. It could be that parties have inadequate information about the benefits of ADR and that this information cannot effectively be communicated to them (if the information could be communicated to the parties, they could decide whether they want to use ADR). The second conventional qualification is that ADR might positively affect third parties. These qualifications could justify promoting or requiring ADR.

Another qualification, special to the context of legal disputes, is that parties who use the courts do not at present pay the full costs of the public services that are thereby rendered to them, whereas one presumes parties do pay the full costs of ADR. Thus, ADR appears more expensive in comparison to the courts than it really is, and ADR might thus be used less often relative to the courts than would be best. (Suppose, for instance, that use of the court truly costs $1,000 and ADR $500, but that parties pay only $250 to use the courts; then ADR appears twice as costly as the courts even though it is really half as costly.) As an antidote to this problem of relative pricing, ADR could be subsidized. But that would not offer a full solution to a problem that emanates from failure to charge completely for use of the courts: if ADR is subsidized along with the courts, both methods of dispute resolution will be cheaper to use than they truly are for society to provide, leading to overutilization of each. Other things being equal, the appropriate policy would seem to be to subsidize neither.

[12] As stated earlier, note 5 *supra*, this is our general policy.

[13] For example, an ADR agreement about divorce might not give proper attention to the well-being of a couple's children.

A final observation is that there is no paradox represented by the conclusion that the law should ordinarily enforce ex ante ADR agreements, which is to say, the law should enforce agreements that bypass the legal process. The legal process may be viewed as having been selected optimally only in an average sense—over a wide class of potential disputes—because there is a limit to the degree to which the legal process can be made sensitive to the particular situations of disputants. This limit is due principally to difficulties that would be faced by courts in determining the detailed characteristics of different situations. But the parties themselves know much about their own situations; typically, they know their situations far better than the courts could. Hence, it is not surprising that parties should be able to choose for themselves a better method of dispute resolution than the legal process would offer and that the courts should respect such choices.

II. Ex Post Agreements to Use Alternative Dispute Resolution

A. Ex Post Alternative Dispute Resolution Agreements and Mutual Benefits

Parties who are in a dispute will decide to make an ADR agreement if this will be to their mutual benefit. The main reasons why ADR may appeal jointly to parties ex post is that it may constitute a cheap substitute for trial or that it may provide them with information about the trial outcome and thus make settlement more likely. In both ways ADR may serve to lower the expected costs of dispute resolution. ADR may also lower risk, as I will discuss in a later subsection dealing with risk aversion. In the next subsection, I review the standard model of litigation without ADR. I then introduce voluntary ADR into the standard model, and, following that, I examine mandatory nonbinding ADR. In the final subsection, I consider social policy and ex post ADR.

Before proceeding, several comments about ex post ADR and ex ante ADR are worth making. First, any mutual advantage that parties can obtain through an ex post ADR agreement can also be obtained through an ex ante ADR agreement—they need merely specify ADR appropriately in an ex ante agreement. (Indeed, I mentioned above in Sec. I*B* that reduction of dispute resolution costs and risk were reasons for ex ante as well as ex post ADR agreements.) Second, parties may not be able to make ex ante ADR agreements because they are not in contact ex ante; this is true by definition for strangers who happen to have a dispute. Or, even if parties are in contact, they may decide it is not worth the trouble to make an ex ante agreement because the odds of a dispute

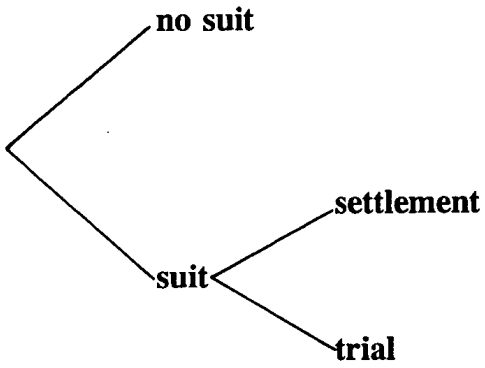

FIGURE 1

are low and because, if a dispute arises, they can make an ex post agreement to gain the advantage they would have from an ex ante agreement.

B. Standard Model of Litigation

As illustrated in Figure 1, according to the standard model of litigation, the plaintiff first decides whether or not to bring suit, and then, if he does, he and the defendant either settle or proceed to trial.[14] Trial is assumed to involve a cost for each side, but, for simplicity, suit is taken to be costless.

In this model, it is supposed that a plaintiff will bring suit if and only if he would have a credible threat thereafter to go to trial. (The motivation is that otherwise the defendant would refuse to pay anything in settlement to the plaintiff.)[15] Assuming, as I shall, that parties are risk neutral,[16] this implies that the plaintiff will bring suit if and only if his expected judgment would exceed his trial cost. If, for instance, the plaintiff would win $10,000 with likelihood 80 percent and his trial cost would be $2,000, his expected judgment would be $8,000, so he would bring suit, but he would not do this if his chance of prevailing were only 10 percent and his expected judgment therefore would be only $1,000.

[14] What I call the standard model is developed in William M. Landes, An Economic Analysis of the Courts, 14 J. Law & Econ. 61 (1971); John P. Gould, The Economics of Legal Conflicts, 2 J. Legal Stud. 279 (1973); Richard A. Posner, Economic Analysis of Law 434–41 (2d ed. 1977); and Steven Shavell, Suit, Settlement, and Trial: A Theoretical Analysis under Alternative Methods for the Allocation of Legal Costs, 11 J. Legal Stud. 55 (1982).

[15] This assumption is justified if the defendant knows the plaintiff's willingness to go to trial (otherwise the plaintiff could feign willingness to go to trial).

[16] I maintain the assumption of risk neutrality for simplicity in this and the next two subsections. The assumption means that parties view uncertain monetary prospects in terms of their probability-discounted values, their "expected values." On risk neutrality, see, for instance, Howard Raiffa, Decision Analysis (1968).

Given that suit is brought, it is supposed that there will be a settlement if and only if there exists a settlement agreement that both parties would prefer to trial. This will be true if the minimum settlement acceptable to the plaintiff is less than the maximum settlement acceptable to the defendant.

EXAMPLE 3. The plaintiff believes he will win \$10,000 with likelihood 70 percent, and his trial costs would be \$1,000. Thus, he would gain \$7,000 − \$1,000 = \$6,000 from trial, so he would accept any amount greater than this in settlement. If the defendant believes the plaintiff's chances of winning at trial are the same and would face trial costs of \$2,000, the defendant's expected losses would be \$7,000 + \$2,000 = \$9,000. Hence, the plaintiff's minimum acceptable amount, \$6,000, is below the defendant's maximum acceptable amount, \$9,000, so there would be a settlement. The reason that there is a range for settlement is that each side would have to pay trial costs; the plaintiff subtracts these from his expected judgment to see what he would net, and the defendant adds them to his expected judgment to see the total he would have to pay. Hence, the sum of trial costs, \$3,000, is what separates the plaintiff's minimum acceptable settlement amount from the defendant's maximum acceptable amount.

If, however, the defendant's beliefs are different, the situation may change. If the defendant believes the plaintiff's chances to be only 50 percent, then the defendant's expected losses would be \$5,000 + \$2,000 = \$7,000, so the difference between the two amounts is \$1,000; there would still be settlement, but just. If the defendant believes the plaintiff's chances of winning are less than 40 percent, there will not be room for settlement since then the defendant will pay less than \$4,000 + \$2,000 = \$6,000 in settlement, which is the least the plaintiff would accept. Note that in this case the defendant's expected judgment is less than \$4,000, or more than \$3,000 below the plaintiff's expected judgment of \$7,000, and \$3,000 is the sum of the two parties' trial costs.

This example illustrates a general and a specific point. The general point is that differences of opinion—the plaintiff's relative optimism about winning—is what makes for trial. If the parties' beliefs are not too far apart, the savings in trial costs will lead them to settle. The more specific point is that the difference between the plaintiff's expected judgment and the defendant's expected judgment must exceed the sum of their trial costs for there to be a trial; otherwise they will settle to save trial costs.[17] This makes sense, in that the two parties together will save the sum of their trial costs if they settle.

[17] In the example above and, unless otherwise noted, in what I will be saying below, differences in plaintiffs' and defendants' expected judgments will derive only from differences in their opinions about the likelihood of prevailing. More generally, however, there could also be differences in their opinions about the size of judgments.

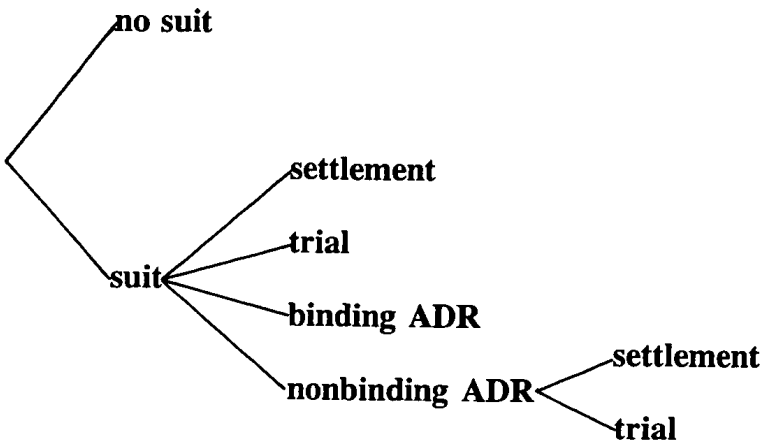

FIGURE 2

C. *Model of Litigation with Voluntary Alternative Dispute Resolution*

Now append to the model the possibility that the parties may agree to ADR, which may either be binding on the parties or nonbinding. After nonbinding ADR, the parties either settle or go to trial. The model with ADR is illustrated in Figure 2. Alternative dispute resolution is assumed to involve a cost for each party, but it is smaller than that of trial (notably, because of the procedural simplicity of ADR).

As in the standard model, it is assumed that the plaintiff will bring a suit if and only if he would then have a credible threat against the defendant. Note that since ADR is voluntary, the defendant is free to refuse ADR. Accordingly, the plaintiff will have a credible threat if and only if he is willing to go to trial. Thus, as before, the plaintiff will bring suit if and only if his expected gain from trial would exceed his trial cost. The availability of ADR therefore does not affect the conditions under which suit will be brought.[18]

To determine what will occur if suit is brought, we must be explicit about the nature of ADR. I will suppose that the parties hold probabilistic beliefs about the outcome of ADR and that ADR will result in either a

[18] This conclusion would not necessarily hold in a model allowing for asymmetry of information and including a cost of bringing suit. In such a model, plaintiffs might bring suit even though they would be unwilling to go to trial because defendants might mistakenly think they would be willing to go to trial. Further, the expected return from bringing suit would be affected by the presence of ADR, for plaintiffs and defendants might agree to use ADR. Hence, whether a plaintiff's expected return exceeds the cost of suit, and thus whether he brings suit, might be affected by the presence of ADR.

plaintiff victory or a defendant victory, with the magnitude of the possible ADR judgment being known by both parties to equal that which would be awarded at trial. (In other words, any uncertainty attending ADR or trial is about liability, not damages.)[19] Also, the ADR outcome may alter the parties' probabilistic beliefs about what would occur at trial. In this regard, I consider two polar cases.

One case is that ADR perfectly predicts trial outcomes. If so, then, if ADR results in a plaintiff victory, the parties will know that trial would result in the same, and if ADR results in a plaintiff loss, the parties will know that that would happen at trial. In this case, a party's probability that he will win in ADR must equal his probability that he will win at trial since he believes that ADR perfectly predicts trial. If, for example, the plaintiff believes he will win at trial with probability 70 percent, then he must also believe that he will win in ADR with probability 70 percent.

The opposing case is that ADR has no predictive value. If so, the parties' beliefs about the trial outcome after ADR will be precisely what they were before ADR. In this case, a party's probability that he will win in ADR need have no particular relationship to his probability of winning at trial. The plaintiff who believes he will win at trial with probability 70 percent might believe that he will win in ADR with a 30 percent probability, with an 80 percent probability, or with any other, for the ADR outcome is by hypothesis independent of the trial outcome.

Of course, in general, ADR will have some, but not perfect, predictive value; thus ADR will change parties' beliefs, but they will not know for sure what will happen at trial after they learn ADR results. This general case is best addressed after the two polar cases are analyzed.

1. THE CASE WHERE ADR PERFECTLY PREDICTS TRIAL OUTCOMES. Our object is to determine which of the four possible outcomes will occur—immediate settlement, immediate trial, binding ADR, or nonbinding ADR. Observe first that immediate trial will never occur because the parties would prefer binding ADR to trial, as binding ADR is cheaper but otherwise equivalent to trial.

EXAMPLE 4. Suppose that the plaintiff believes he would win \$10,000 at trial with probability 70 percent, that trial costs would be as in example 3, and that ADR costs would be \$500 for each party. The plaintiff also believes that he will win \$10,000 in binding ADR with probability 70 percent (since, as explained above, ADR perfectly predicts trial outcomes). The plaintiff would therefore obtain a net amount of \$7,000 − \$1,000 = \$6,000 from trial and a net amount of

[19] This assumption is made mainly for simplicity, but see note 21 *infra*, and see also the subsection on risk aversion.

$7,000 − $500 = $6,500 from binding ADR, so he would prefer the latter to trial. Similarly, the defendant would prefer binding ADR to trial.

With regard to nonbinding ADR, note that, after such ADR, the parties will definitely settle, for at that point they will agree on what would happen at trial. In particular, if the plaintiff loses in ADR, the parties will both believe that the plaintiff would definitely lose at trial, so the plaintiff will not pursue the matter, in effect settling for zero. If the plaintiff wins in ADR, the parties will both believe that the plaintiff would surely win at trial, so they will settle for some quantity approximating the judgment amount, and for simplicity I assume they will settle for exactly the judgment amount.[20] (Thus, in the above example, the parties will settle for $10,000 if the plaintiff wins in ADR.) On reflection, therefore, nonbinding ADR is seen to be essentially equivalent to binding ADR. Under both, the plaintiff obtains nothing if he loses in ADR, and he obtains his judgment if he wins—either in a settlement, under nonbinding ADR, or as an award, under binding ADR.

The remaining possibility is immediate settlement. This the parties may decide upon—yet only if settlement is mutually preferable not only to trial but also to ADR. Recall from Section II*B* above that the parties will prefer settlement to trial if and only if the plaintiff's expected judgment exceeds the defendant's by less than the sum of trial costs. By the same logic, the parties will prefer settlement to binding (and thus to nonbinding) ADR if and only if the plaintiff's expected judgment exceeds the defendant's by less than the sum of ADR costs. Since ADR costs are lower than trial costs, if the parties prefer settlement to ADR, they will also prefer settlement to trial, but if they prefer settlement to trial, they might still prefer ADR to settlement. In example 4 the sum of trial costs is $3,000, and the sum of ADR costs is $1,000. Thus, if the difference in plaintiff's and defendant's probability assessments of winning $10,000 is less than 10 percent, the parties will settle, otherwise they will employ ADR; and if the difference in their probability assessments is between 10 percent and 30 percent, they would have settled in the absence of ADR but here will use ADR.

In summary, the parties will never go to trial. They will settle immediately if and only if the plaintiff's expected judgment exceeds the defendant's by less than the sum of ADR costs. Otherwise, the parties will

[20] To illustrate, in example 4, the parties might settle for some amount in the range between $9,000 (the amount the plaintiff would net from trial) and $12,000 (the amount the defendant would lose at trial). I am assuming that they would settle for exactly $10,000. This assumption is not crucial and is not made in the Appendix.

elect either binding or nonbinding ADR, the two being equivalent. If they choose nonbinding ADR, they will settle afterward.[21]

There are two differences between the outcome here and that in which ADR is not available: there are no trials, and immediate settlement occurs less often because ADR sometimes occurs instead.

2. THE CASE WHERE ADR HAS NO PREDICTIVE VALUE. In this case, the parties will never choose nonbinding ADR since after such ADR their beliefs will not be changed, and they will thus be in the same position as before yet have incurred costs.

Binding ADR, however, might be chosen by the parties because it may serve as a cheap substitute for trial (even though it does not predict trial outcomes). Consider the following illustration.

EXAMPLE 5. Suppose that, in both ADR and a trial, the plaintiff thinks he will win $10,000 with probability 80 percent and the defendant thinks the plaintiff's chances are 40 percent.[22] Suppose too that trial and ADR costs are as before. Then the parties would rather go to trial than settle, for the difference in their expected judgments is $4,000, which exceeds the $3,000 sum of trial costs. But they would clearly prefer binding ADR to trial since each obtains the same expected judgment under it as under trial but bears lower costs.

More generally, binding ADR might be preferred to trial not only because it is cheaper but also because the plaintiff's and defendant's beliefs about ADR may diverge more than they diverge about trial (and thus ADR may provide them, in effect, with a better bet).

Settlement may also be preferred to trial and to binding ADR. Settlement will be preferred to trial if the divergence in expected judgments from trial is less than the sum of trial costs. Settlement will be preferred to binding ADR if the divergence in expected ADR awards exceeds the sum of ADR costs. If both of these conditions hold true, then settlement will be elected by the parties.

To summarize, the parties might go immediately to trial, settle, or

[21] If there were uncertainty over not just liability but also the judgment amount, the results would be similar (assuming ADR perfectly predicts both liability and the judgment amount). The parties would never go to trial because binding ADR would dominate trial; they would always settle following nonbinding ADR; and so forth. (I will make no further comments in footnotes about the situation where the judgment amount is uncertain.)

[22] Of course, the simplifying assumption made in this example, that for each party the probability of prevailing is the same in ADR as at trial, does not contradict the assumption that ADR has no predictive value. The outcomes of ADR and trial can be independent events yet have equal likelihoods (much as the outcomes of different tosses of a fair coin are independent events even though the chance of heads is 50 percent on each toss). The result in this example can also be produced if the probability of prevailing in ADR and at trial differs for each party.

engage in binding ADR, but never in nonbinding ADR. Comparing the outcomes to those when ADR is not available, there will be trial, but less often than before, and there will be settlement, but less often than before. Binding ADR will to some extent be chosen instead of settlement or trial.

3. THE CASE WHERE ADR IS AN IMPERFECT PREDICTOR OF TRIAL OUTCOMES. In this case, if there is nonbinding ADR, it may or may not be followed by settlement, depending on how parties' beliefs are affected by the ADR outcome.

EXAMPLE 6. Suppose that, if the plaintiff prevails in ADR, he will believe he will win \$10,000 at trial with probability 80 percent and that, if he loses in ADR, he will believe that he will win at trial only with probability 60 percent. Also, suppose that the defendant thinks that, if the plaintiff wins in ADR, the plaintiff will win at trial with probability 65 percent and that, if the plaintiff loses in ADR, the plaintiff will win at trial with probability 20 percent. Further, assume that the costs of trial for the plaintiff and the defendant are as before. Then, if the plaintiff wins in ADR, there will be a settlement: the difference in expected judgments will be \$8,000 − \$6,500 = \$1,500, which is less than the sum of trial costs, \$3,000. But if the plaintiff loses in ADR, there will be a trial: the difference in expected judgments will be \$6,000 − \$2,000 = \$4,000, which exceeds \$3,000.

Similar logic shows that, if, after the plaintiff loses in ADR, he will believe that his chance of winning at trial is 40 percent, there will be a settlement if he loses in ADR as well as if he wins. And if, after the plaintiff wins in ADR, he will believe that his chance of winning at trial is 100 percent, there will be a trial if he wins in ADR as well as if he loses. Further, if, after the plaintiff wins in ADR, the plaintiff's and defendant's probabilities of the plaintiff winning at trial will be, respectively, 100 percent and 60 percent and if, after the plaintiff loses in ADR, the same probabilities will be 50 percent and 40 percent, then there will be a trial if the plaintiff wins in ADR and a settlement if the plaintiff loses in ADR.

As this example illustrates, it is possible for nonbinding ADR to be followed always by settlement, by settlement only if there is a plaintiff win in ADR or only if there is a defendant win, or never to be followed by settlement.

The analysis of binding ADR, immediate trial, and immediate settlement is essentially the same as in the previous two cases.

Any of the four possibile outcomes may occur, and the factors that lead to each can be understood by reference to the discussion above. For instance, the parties would elect binding ADR over other alternatives if, similar to case 2, it is attractive as a substitute for trial, nonbinding ADR would not necessarily lead to settlement, and so forth.

D. Model of Litigation with Nonbinding Alternative Dispute Resolution Required before Trial

Assume next that the option of immediate trial is not open; that is, assume that parties must engage in nonbinding ADR before they can

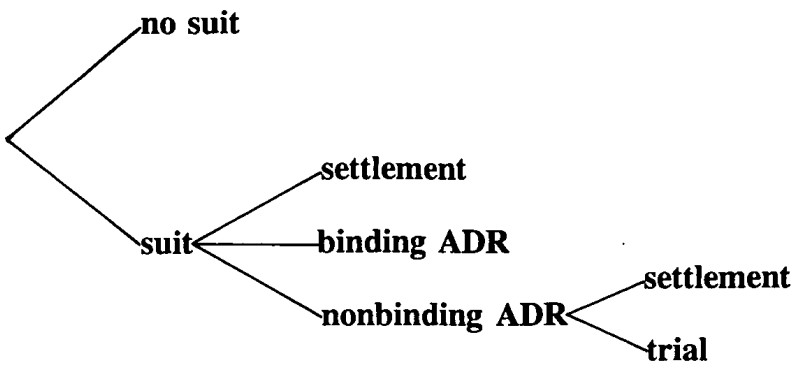

FIGURE 3

proceed to trial. (They can, of course, settle immediately or decide to employ binding ADR rather than nonbinding ADR.) Then the situation is as illustrated in Figure 3.[23] Because the plaintiff's threat in this situation is to engage in nonbinding ADR, the plaintiff will bring suit if and only if his expected gain resulting from nonbinding ADR exceeds his costs. His expected gain from nonbinding ADR will be investigated below; as we will see, it can be greater or less than what it would be from immediate trial, so that the incentive to sue can be larger or smaller than in the absence of required nonbinding ADR before trial.

1. THE CASE WHERE ADR PERFECTLY PREDICTS TRIAL OUTCOMES. In this case, given that suit is brought, recall that the parties would never elect to go to trial immediately, so that the requirement that they use nonbinding ADR before trial will never constrain what they would otherwise do. Hence, given that suit is brought, the parties will behave as described earlier. They will either settle immediately, if the difference in expected judgments is less than the sum of ADR costs, or they will engage in ADR. And if they engage in ADR, they will be indifferent between binding and nonbinding ADR.

We can, however, say something about the tendency of the plaintiff to bring suit. As we discussed, if the plaintiff engages in nonbinding ADR and prevails, he will then settle for an amount equal to the judgment. Hence, the expected gross return to the plaintiff from ADR is the same as that from trial, but ADR costs less; the plaintiff's net return will therefore exceed that from going to trial. Consequently, suit will be more frequent than when ADR was not required.

[23] In part of her article, Bernstein, note 7 *supra*, performs simulations with a model in which the plaintiff and the defendant are assumed to engage in required nonbinding ADR (there is no option of binding ADR), in which ADR does not convey information about trial outcomes (she informally discusses ADR that does convey information), and in which there is uncertainty not only about liability but also the magnitude of damages.

EXAMPLE 7. Suppose that the plaintiff will win in ADR or in trial with probability 40 percent, that the judgment amount would be $10,000, that his trial costs would be $5,000, and that his ADR costs would be $2,000. Then, if nonbinding ADR is not required, the plaintiff would not bring suit: he would not be willing to go to trial, for his expected judgment of $4,000 is less than his trial costs of $5,000. But if nonbinding ADR is required, he would bring suit: he would be willing to engage in nonbinding ADR, for his ADR costs are only $2,000 and his expected settlement would be $4,000 (if he wins in ADR, he will have a credible threat to go to trial—since he would win at trial for sure—and he will settle for $10,000).

The reason that the plaintiff will sue more often is, in essence, that ADR provides a cheap substitute for trial to which the defendant must submit if the plaintiff wants. Before, since the defendant could refuse to participate in this cheap substitute for trial, the plaintiff did not sue as often.

2. THE CASE WHERE ADR HAS NO PREDICTIVE VALUE. In this case, the conclusion from Section II*C* above was that the parties might go immediately to trial, settle, or engage in binding ADR, but the parties would never engage in nonbinding ADR because this would not change their beliefs, only absorb resources. Consequently, preventing the parties from going immediately to trial may alter what occurs given that suit is brought. In particular, parties may decide to use nonbinding ADR if, in the absence of the requirement to do so, they would have elected to go immediately to trial. When that is so, they now will have to, in effect, pay larger trial costs since now they will have to bear the costs of ADR plus the costs of trial in order to go to trial. They may be willing to do this if the difference in their expected beliefs is large enough. Otherwise, they will settle immediately or use binding ADR.

With regard to the propensity to bring suit, it can be demonstrated that suit will be less frequent than when ADR is not required before trial. A person who is contemplating suit knows that his threat is to use nonbinding ADR. But since this might be followed by trial,[24] the cost he would face to go to trial is the cost of ADR plus the cost of trial. Hence, if ADR would be followed by trial, he will bring suit only if the expected judgment exceeds the sum of the cost of ADR and the cost of trial. Thus, he will bring suit less often than if his cost were only the cost of trial, the situation when ADR was not required.

EXAMPLE 8. Suppose example 7, except that the plaintiff's cost of trial is $3,000 and that ADR has no predictive value. Then he would bring suit if ADR were voluntary because he would have a credible threat to sue—$3,000 is less

[24] If nonbinding ADR would be followed by settlement, the situation is similar. See the Appendix.

than his $4,000 expected judgment. But the plaintiff might not sue if nonbinding ADR must precede trial. The plaintiff's threat is not to go immediately to trial but, rather, to engage in ADR at a cost of $2,000 and then go to trial. If, after ADR, the plaintiff and the defendant would not settle (because the defendant's beliefs are sufficiently different from the plaintiff's), the plaintiff would have to spend an additional $3,000 on trial. Hence, the plaintiff would have to spend $5,000 in total to win an expected $4,000. This means that the plaintiff would not have a credible threat and would not bring suit.

3. THE CASE WHERE ADR IS AN IMPERFECT PREDICTOR OF TRIAL OUTCOMES. With regard to this case, it is apparent that, given that suit is brought, the requirement may or may not affect the outcome, depending on whether immediate trial would or would not have been chosen, as described earlier. Immediate trial would have been chosen, roughly, if ADR would be a relatively poor predictor of trial outcomes and if there was an initially large difference in beliefs between plaintiff and defendant. Also, the plaintiff's tendency to bring suit will tend to be increased by the nonbinding ADR requirement if ADR is fairly informative and often leads to settlement; otherwise, the frequency of suit will tend to be reduced by the ADR requirement.

E. Comparison of Regimes without Alternative Dispute Resolution, with Voluntary Alternative Dispute Resolution, and with Nonbinding Alternative Dispute Resolution Required before Trial

I can summarize as follows. The propensity to sue is the same in regimes without ADR and with voluntary ADR, for under both the plaintiff must be willing to go to trial to have a credible threat against the defendant. But when nonbinding ADR must precede trial, the tendency to sue is different; the plaintiff will sue if he would be willing to engage in nonbinding ADR. This means that the tendency to sue is greater than otherwise if ADR would be followed by settlement, something that is likely if ADR predicts trial outcomes. But it means that the tendency to bring suit will be less than otherwise if ADR would not be followed by settlement and would therefore merely add costs to the litigation process; this is likely if ADR does not predict trial outcomes very well.

Given that suit is brought, ADR leads to substitution away from both trial and settlement and toward ADR. The specifics of the substitution depend, as explained, on the costs of ADR, on how informative ADR is of trial outcomes, and on whether nonbinding ADR is required before trial.

F. Risk Aversion

To this point, it has been assumed that parties are risk neutral. If one or both are risk averse and suit has been brought, immediate settlement

becomes more attractive because it reduces risk. Specifically, if there is an immediate settlement, parties bear no risk, whereas they would bear risk not only if they went to trial, but also if they engaged in ADR. Alternative dispute resolution obviously involves risk if it is binding. If ADR is nonbinding but has some predictive value about trial, it also involves risk, for even if there is a settlement after ADR, the settlement amount will be affected by the ADR outcome.

Of course, even though settlement is more attractive in the presence of risk aversion, the parties may not settle. If they do not, then risk aversion may make binding ADR more attractive than it would otherwise be. If, unlike in the model I examined, the amount of damages is uncertain, but less subject to variation under ADR than under trial, binding ADR will reduce risk for the parties. Another point is that risk aversion means that nonbinding ADR is more likely to be followed by settlement than we had shown.

The general conclusion is then that risk aversion makes both immediate settlement and, possibly, binding ADR, more desirable than otherwise and thus reduces the frequency of trial from what it would otherwise be.

With regard to whether suit will be brought, risk aversion generally reduces the bringing of suits. This is because the prospect of trial (or of nonbinding ADR where this is required before trial) becomes less attractive, so the plaintiff would have a credible threat against the defendant less often.

G. Ex Post Alternative Dispute Resolution Agreements and Social Policy

As mentioned in the introduction, when parties decide whether or not to adopt ADR after disputes have arisen, they have no reason to take into account the fact that the prospect of ADR may affect their behavior in an undesirable way. For instance, ADR agreements that plaintiffs and defendants rationally agree to when disputes arise may reduce defendants' payments to plaintiffs. Anticipating this, defendants' incentives to prevent injuries will therefore be reduced, and that could lower plaintiffs' well-being. Thus, we do not know that ADR agreements made ex post will advance parties' welfare.

This means that, in principle, we cannot say that ADR agreements made ex post should be enforced. Nevertheless, one suspects that the advantages of ex post ADR agreements often outweigh the possible disadvantages attending parties' failure to take incentive effects into account when they decide ex post about ADR.

In any case, there is again no clear argument for the state's encouraging

the use of ADR, notably, for it to insist on nonbinding ADR before trial. Not only do we not know what effect this has on behavior, we have seen in the analysis that it can have effects on legal costs and the tendency to bring suit that could be disadvantageous. Required nonbinding ADR can for instance reduce the incentive to sue and raise the cost of litigation in situations where neither would be desirable.

III. Concluding Remarks

Among the issues omitted from the analysis is that concerning the exchange of information during ADR. If ADR alters parties' opinions about trial outcomes, often bringing them close enough to promote settlement, then it must be that ADR results in a party obtaining information that it would not otherwise learn. One wonders why, exactly, this should be true. Why should ADR result in parties learning more than they would through voluntary exchange of information and the discovery process? It is sometimes said that ADR provides parties new information because they hear the opinion of a neutral outsider, yet it would seem that parties could always consult individually with outsiders without adopting ADR. It is sometimes suggested as well that ADR may furnish clients a unique chance to understand the character of their cases and thereby help to defeat client-lawyer agency problems. Whatever is the truth of the matter, it warrants investigation.

Another issue of interest not addressed above is why there is strong support for public encouragement of ADR. A major explanatory element, if not the principal one, is no doubt the simple fact that ADR is cheaper than trial. Thus, whenever a dispute is resolved through ADR instead of trial, dispute resolution costs are lowered. What may frequently not be given due weight are two other facts. First, as elaborated here, ADR can influence the frequency of suit and leads many parties who would have settled instead to engage in ADR—raising dispute resolution costs. Second, private parties have strong motives of their own to elect ADR, and special arguments are required to justify public promotion of it.

APPENDIX

Ex Post Alternative Dispute Resolution

A. Framework of Analysis and Assumptions

In this appendix, I will introduce ADR into the standard model of litigation, as discussed in the text. Under the simple version of the standard model that I consider, parties are risk neutral, bear their own legal costs, know the judgment

amount that would be awarded, but may hold different beliefs about the likelihood of a plaintiff victory. Let

x = amount that would be won at trial, $x > 0$;
p_i = probability that plaintiff will win at trial in the opinion of party i, where $i = \pi$ for plaintiff, or $i = \delta$ for defendant; and
t_i = cost of trial to party i; $t_\pi < x$.[25]

I assume also that there is a single ADR method which, if employed, precedes trial. Under ADR the parties bear their own costs, which are lower than those of trial, the judgment amount is x, the same as at trial, and the parties may hold different beliefs about the likelihood of a plaintiff ADR victory. Define

q_i = probability that plaintiff will win in ADR in the opinion of party i;
a_i = cost of ADR proceeding to party i, $a_i < t_i$;

so that

$$a_\pi + a_\delta < t_\pi + t_\delta. \tag{A1}$$

Under binding ADR, the plaintiff obtains x if he wins in ADR and nothing otherwise, and there can be no trial afterward. Under nonbinding ADR, ADR may be followed by trial or settlement. When ADR is nonbinding, the probabilities of outcomes at trial conditional on the ADR outcome become relevant. Let

p_{iw} = probability that plaintiff will win at trial in the opinion of party i, conditional on a plaintiff win in ADR; and
$p_{i\ell}$ = probability that plaintiff will win at trial in the opinion of party i, conditional on a plaintiff loss in ADR.

By the laws of conditional probability,

$$p_i = q_i p_{iw} + (1 - q_i)p_{i\ell}; \tag{A2}$$

the initial likelihood of winning at trial is the expected value of the conditional likelihoods of winning at trial after ADR.

A case of interest will be where ADR outcomes perfectly predict trial outcomes. In this case, $p_{iw} = 1$ and $p_{i\ell} = 0$, and from (A2), it must then be that $p_i = q_i$. (The sense behind this is, of course, that, since ADR is believed by parties to predict perfectly the trial outcomes, they must have the same beliefs about ADR as they do about the trial outcomes.) An opposite case of interest is where ADR outcomes convey no information about trial outcomes; that is, they are independent of trial outcomes. Here $p_{iw} = p_{i\ell} = p_i$.

I will consider three regimes: where trial alone is available to the parties if they do not settle, where the parties may voluntarily elect (binding or nonbinding) ADR before trial, and where the parties are required to employ nonbinding ADR before trial.

In each regime, it will be asked when plaintiffs will bring suit, assuming that

[25] This assumption will guarantee that the plaintiff would be willing to go to trial if he knew for sure that he would prevail.

this is costless, and then what plaintiffs and defendants will do if suit is brought. Two general assumptions will be made: (1) a plaintiff will bring suit if and only if he has an opportunity later to take an action that would yield him a positive expected return; (2) at any stage, parties will make an agreement if and only if it is Pareto superior to their alternatives. (These regimes and assumptions will be further described as I proceed.)

B. Standard Model of Litigation

In this regime, if the plaintiff brings suit, the parties either settle or go to trial, as was illustrated in Figure 1.[26] According to the first general assumption, the plaintiff will bring a suit if and only if he would be willing to go to trial, thus, if and only if his expected return from trial,[27]

$$E_{\pi}^{T} = p_{\pi}x - t_{\pi}, \tag{A3}$$

is positive. Let us therefore state:

PROPOSITION 1. Assume that trial alone is available to parties. Then a plaintiff will bring suit if and only if he would be willing to go to trial ([A3] is positive).

To continue, the expected cost of trial for the defendant is

$$E_{\delta}^{T} = p_{\delta}x + t_{\delta}. \tag{A4}$$

Given that suit is brought, according to the second general assumption, the parties will agree to settle if and only if that is superior to trial for both. Equivalently, they will settle if and only if there is a settlement amount greater than or equal to (A3) and less than or equal to (A4), which is to say, if and only if $p_{\pi}x - t_{\pi} \leq p_{\delta}x + t_{\delta}$, or

$$(p_{\pi} - p_{\delta})x \leq t_{\pi} + t_{\delta}. \tag{A5}$$

In summary,

PROPOSITION 2. Assume that trial alone is available to parties and that suit has been brought. Then there will be a settlement if and only if the difference between the plaintiff's and defendant's estimates of the expected judgment is lower than total trial costs (that is, [A5] holds). Otherwise there will be a trial.

C. Model of Litigation with Voluntary Alternative Dispute Resolution

In the regime with the availability of ADR, if the plaintiff brings suit, the parties may either settle, go to trial, or elect binding or nonbinding ADR, as was

[26] It should be remarked that while the standard model appears to capture important elements of litigation, it is not an explicit model of bargaining because the specific actions of the plaintiff and of the defendant, who offers what to whom and when, are not specified; Figure 1 is not the extensive form of a game. (However, it is clear that an explicit model of bargaining could be constructed corresponding to Figure 1: let the parties have symmetric information [notably, about each other's beliefs], let the plaintiff decide whether to sue and if so on a single settlement offer to the defendant, and so forth.) Nevertheless, I append ADR to the standard model because of the tractability of the model. In any case, a useful next step in the study of ADR would be to examine an explicit model of bargaining with asymmetric information and ADR.

[27] Here and in what follows, E will stand for expected value, superscripts will refer to the action, such as trial or ADR, and subscripts for plaintiff or defendant.

illustrated in Figure 2. Since the defendant can always refuse to settle or to engage in ADR, the plaintiff will again bring a suit if and only if he would be willing to go to trial, if and only if E_π^T is positive. Hence,

PROPOSITION 3. Assume that ADR is available to parties. Then a plaintiff will bring suit if and only if he would be willing to go to trial ([A3] is positive).

Given that the plaintiff sues, according to the second general assumption there will be an agreement to settle or to employ ADR if this agreement is Pareto superior to other possible agreements. To analyze this, it is convenient to define the net expected value of an action A to be the plaintiff's expected gain E_π^A from A minus the defendant's expected losses E_δ^A from A. (The action A will either be settlement, trial, binding ADR, or nonbinding ADR.) Now we can state a general and useful point.

Remark. An action A is Pareto superior to another action A' if the net expected value under A exceeds that under A', that is, if $E_\pi^A - E_\delta^A > E_\pi^{A'} - E_\delta^{A'}$.

This follows from a familiar argument.[28] The remark implies that, to determine what the parties will do at the second step, it is sufficient to determine the net expected value of each of the four actions and see which is highest. Now under settlement, the net expected value is

$$E_\pi^S - E_\delta^S = s - s = 0. \tag{A6}$$

The net value is zero since what the defendant pays the plaintiff receives. Under trial, the net expected value is

$$E_\pi^T - E_\delta^T = (p_\pi - p_\delta)x - (t_\pi + t_\delta), \tag{A7}$$

namely, the difference in expected judgments less the sum of trial expenses. To determine the net expected values under ADR, and what the parties will do, it is informative to consider separately the cases where ADR perfectly predicts trial outcomes, where ADR contains no information about trial outcomes, and where ADR contains imperfect information about trial outcomes.

1. THE CASE WHERE ADR PERFECTLY PREDICTS TRIAL OUTCOMES. If there is binding ADR, then the plaintiff's expected return is

$$E_\pi^B = p_\pi x - a_\pi \tag{A8}$$

since $q_\pi = p_\pi$. (B stands for binding ADR.) Similarly, the defendant's expected losses are

$$E_\delta^B = p_\delta x + a_\delta. \tag{A9}$$

Hence,

$$E_\pi^B - E_\delta^B = (p_\pi - p_\delta)x - (a_\pi + a_\delta). \tag{A10}$$

If there is nonbinding ADR and it results in the plaintiff prevailing, then both parties will believe that trial will result in the plaintiff winning (recall that $p_{iw} = 1$). Hence, there will be a settlement; for (A5) will be satisfied, as its left side will be zero. The settlement will be for some amount between $x - t_\pi$ and $x + t_\delta$; let

[28] Let the action be A and let the plaintiff receive from the defendant $z = E_\pi^{A'} - E_\pi^A$; thus the plaintiff will be indifferent between A and A'. The defendant's costs will be $E_\delta^A + z = E_\delta^A + E_\pi^{A'} - E_\pi^A$, which by the hypothesis is less than $E_\delta^{A'}$. Hence, if z' is slightly greater than z, both plaintiff and defendant will be strictly better off under A than A'.

the settlement amount, which we assume can be foreseen by the parties, be denoted s. If nonbinding ADR results in a loss for the plaintiff, then both sides will believe that trial will result in the plaintiff losing, so there will be no positive settlement (nor trial). Accordingly, we have

$$E_\pi^N = p_\pi s - a_\pi, \tag{A11}$$

$$E_\delta^N = p_\delta s + a_\delta, \tag{A12}$$

and

$$E_\pi^N - E_\delta^N = (p_\pi - p_\delta)s - (a_\pi + a_\delta) \tag{A13}$$

(N stands for nonbinding ADR). Now that we have determined the net expected values for ADR, settlement, and trial, we can say what will occur. Observe first that trial will not occur immediately, for binding ADR is Pareto superior: (A1) implies that (A10) exceeds (A7). Moreover, trial will not occur after nonbinding ADR; only settlement will, or the dispute will end. There will be settlement if both (A10) and (A13) are negative; otherwise there will be ADR. If there is ADR, the form will be determined by whichever is higher, (A10) or (A13), and this in turn is determined by s; if $s > x$, then (A13) is higher than (A10), and nonbinding ADR will be chosen. In summary, we have:

PROPOSITION 4. Assume that ADR perfectly predicts trial outcomes and that suit has been brought. Then (*a*) immediate trial will never occur; (*b*) immediate settlement will occur if both types of ADR yield negative expected values (if both [A10] and [A13] are negative), otherwise ADR will occur; (*c*) if nonbinding ADR occurs, it will be followed by settlement if the plaintiff wins and by termination of the dispute if the defendant wins. Nonbinding ADR is Pareto superior to binding ADR (and therefore will occur rather than binding ADR) if and only if the settlement following success exceeds x, the amount at stake.

Note. (1) The explanation for the result is as discussed in the text. Immediate trial does not occur since binding ADR is equivalent to it but is cheaper. Nonbinding and binding ADR might not be equivalent, but this is due to what is best regarded as a subtlety: that under nonbinding ADR, the settlement amount may be different from the stakes x, which makes the value of the gamble of nonbinding ADR different from that of trial itself. (2) The situation with ADR differs from that when ADR is not available. With ADR, trial never occurs, but it may otherwise. Also, with ADR, immediate settlement occurs less often than when ADR is not available, since some cases that would have settled go to ADR.

2. THE CASE WHERE ADR HAS NO PREDICTIVE VALUE. If there is binding ADR, then

$$E_\pi^B = q_\pi w - a_\pi, \tag{A14}$$

$$E_\delta^B = q_\delta w + a_\delta, \tag{A15}$$

and

$$E_\pi^B - E_\delta^B = (q_\pi - q_\delta)x - (a_\pi + a_\delta). \tag{A16}$$

If there is nonbinding ADR, the situation afterward will be exactly as in the case without ADR, for the probabilities of the plaintiff and the defendant will not have changed from their initial values p_π and p_δ. Hence, there will be a settlement if

and only if (A5) holds; otherwise there will be a trial. Accordingly, if (A5) holds, we have

$$E_\pi^N = s - a_\pi, \tag{A17}$$

$$E_\delta^N = s + a_\delta, \tag{A18}$$

and

$$E_\pi^N - E_\delta^N = -(a_\pi + a_\delta). \tag{A19}$$

This is less than zero, the sum of values from immediate settlement, so that immediate settlement is Pareto superior. In contrast, if (A5) does not hold, so that trial will follow nonbinding ADR, then

$$E_\pi^N = p_\pi x - t_\pi - a_\pi, \tag{A20}$$

$$E_\delta^N = p_\delta x + t_\delta + a_\delta, \tag{A21}$$

and

$$E_\pi^N - E_\delta^N = (p_\pi - p_\delta)w - (t_\pi + t_\delta) - (a_\pi + a_\delta). \tag{A22}$$

This is less than (A7), so trial is Pareto superior to nonbinding ADR. Thus, nonbinding ADR cannot occur. From what I have said, the next result follows.

PROPOSITION 5. Assume that ADR has no predictive value and that suit has been brought. Then (*a*) nonbinding ADR will never occur; (*b*) immediate settlement will occur if trial and binding ADR yield negative net expected values (if both [A7] and [A13] are negative); (*c*) otherwise, immediate trial or binding ADR will occur, whichever yields the greater net expected value.

Note. (1) The explanation for this result is, first, that since ADR does not change opinions about trial outcomes, if ADR is nonbinding, it imposes costs on parties but leaves them in the same position as if ADR had not occurred; hence, it is undesirable. Binding ADR, however, may serve as a mutually beneficial substitute for trial, since it is cheaper than trial. There must be a difference of opinion that makes it desirable, though, for it to be chosen over settlement and trial. (2) The situation with ADR may be compared to that without ADR. Here, again, ADR occurs in some cases where settlement would have occurred and in some cases where trial would have occurred (but there is a residual probability of trial, unlike in the case where ADR perfectly predicts trial outcomes).

3. THE CASE WHERE ADR IS A POSSIBLY IMPERFECT PREDICTOR OF TRIAL OUTCOMES. In this general situation, no restrictions are imposed on the q_i and the p_{iw} and $p_{i\ell}$. Clearly, if there is binding ADR, then (A14)–(A16) still apply. If there is nonbinding ADR, then afterward there will be settlement or trial according to the condition analogous to (A5). Specifically, if ADR results in plaintiff success, there will be a settlement if and only if

$$(p_{\pi w} - p_{\delta w})x \leq t_\pi + t_\delta; \tag{A23}$$

if there is a settlement, let s_w denote the settlement amount (which will be in between $p_{\pi w}x - t_\pi$ and $p_{\delta w}x + t_\delta$). If ADR results in a loss, there will be a settlement if and only if

$$(p_{\pi \ell} - p_{\delta \ell})x \leq t_\pi + t_\delta; \tag{A24}$$

let s_ℓ denote the settlement amount. Any combination of situations after ADR is possible: trial independent of the ADR outcome, settlement independent of the ADR outcome, settlement only after plaintiff success in ADR, or settlement only after defendant success in ADR. Given the situation after ADR (as determined by [A23] and [A24]), it is straightforward to calculate the plaintiff's expected return and the defendant's expected costs. To illustrate, suppose that there will be settlement after plaintiff success in ADR and trial after defendant success. Then $E_\pi^N = q_\pi s_w + (1 - q_\pi)(p_{\pi\ell}x - t_\pi)$ and $E_\delta^N = q_\delta s_w + (1 - q_\delta)(p_{\delta\ell}x + t_\delta)$. It is readily verified that any of the four possible outcomes may occur: immediate trial, settlement, binding ADR, or nonbinding ADR.[29] In summary, we have:

PROPOSITION 6. In the general case with ADR, assume that suit has been brought. Then either immediate trial, settlement, binding ADR, or nonbinding ADR may result, whichever yields the greatest net expected value.

D. Model of Litigation with Nonbinding Alternative Dispute Resolution Required before Trial

If nonbinding ADR is required before trial, the situation is as was discussed in Figure 3. Since the plaintiff's threat is thus to engage in ADR rather than in immediate trial, we have:

PROPOSITION 7. Assume that nonbinding ADR is required before trial. Then a plaintiff will bring suit if and only if he would be willing to engage in nonbinding ADR.

Note. In general, the conditions under which a plaintiff would be willing to engage in nonbinding ADR are different from those under which he would be willing to go to trial. Thus, the frequency of suit will differ in the present regime from above.

It is clear that the formulas describing the plaintiff's expected returns and the defendant's expected costs under settlement, binding ADR, and nonbinding ADR are as expressed in the previous section. The only difference here is that the alternative of immediate trial has been removed. Hence, given that suit has been brought, we determine what occurs by finding the greatest net expected value among three alternatives rather than four.

If ADR perfectly predicts trial outcomes, we can determine the expected return from nonbinding ADR as follows. If the plaintiff prevails in ADR, he will obtain s. (Note here that the plaintiff will have a credible threat if he wins in ADR since he could go to trial and win x for sure, and $x > t_\pi$.) Hence, the plaintiff's net gain from ADR is $p_\pi s - a_\pi$, (A11). Thus, we can state:

PROPOSITION 8. Assume that nonbinding ADR must precede trial and that ADR perfectly predicts trial outcomes. Then (*a*) suit will be brought if the plaintiff would obtain a positive return from nonbinding ADR, that is, if (A11) is positive. (*b*) Given that suit is brought, proposition 4 describes what will occur.

Note. The only difference from the case where ADR is not required concerns the frequency of suit. Here, suit is brought whenever $p_\pi s - a_\pi \geq 0$, rather than whenever $p_\pi x - t_\pi \geq 0$. Suit will therefore be brought more often in the present regime if $p_\pi s - a_\pi$ tends to exceed $p_\pi w - t_\pi$. One might expect this to be the

[29] This is obvious, since the two previous cases, where ADR perfectly predicts trial outcomes and where it conveys no information, are limiting cases of the present case and since each of the four outcomes can occur in at least one of the two previous cases.

case: the fact that $a_\pi < t_\pi$ tends to make the expected return from nonbinding ADR higher; but if the settlement amount s following success in ADR is less than w, the expected return under ADR could in principle be lower than that from trial.[30]

If ADR conveys no information about trial outcomes, then the expected return from nonbinding ADR can be explained as follows. First, note that, if the plaintiff would not be willing to go to trial after ADR—that is, if (A3) were not positive—the defendant would not pay anything in settlement. Hence, the return from nonbinding ADR will be negative if (A3) is not positive. If (A3) is positive, there are two possibilities after ADR. One is that the parties will settle because (A5) holds. In this case, the expected return to the plaintiff from nonbinding ADR is $s - a_\pi$, (A17). Since s is between $p_\pi x - t_\pi$ and $p_\delta x + t_\delta$, (A17) is less than (A3). The other case is that the parties will go to trial because (A5) does not hold. In this case, the expected return from nonbinding ADR is $p_\pi x - t_\pi - a_\pi$, (A20), which is less than (A3). We therefore have:

PROPOSITION 9. Assume that nonbinding ADR must precede trial and that ADR has no predictive value. Then (*a*) suit will be brought if the plaintiff would obtain a positive return from nonbinding ADR—that is, if either (A17) or (A20), whichever is relevant, is positive. (It follows that suit will be brought less often than when suit is voluntary, for [A17] and [A20] are less than [A3].) Given that suit is brought, (*b*) nonbinding ADR will occur if its net expected value (given by [A22]) is positive and exceeds that under binding ADR (given by [A16]). In this case, nonbinding ADR will be followed by trial. (*c*) Otherwise, binding ADR will occur if its net expected value is positive, and immediate settlement will occur if not.

Note. (1) One difference from the case where ADR is not required concerns the frequency of suit, which is lower than when ADR is not required. The intuition is that for ADR to have a positive return, it must certainly be true that after ADR the plaintiff has a credible threat to bring a suit, but after ADR the plaintiff will have the same information as before, so for him to have a credible threat (A3) must be positive, the same condition for the plaintiff to bring a suit when ADR was voluntary (or in the absence of ADR). But this is only the condition for the plaintiff to obtain a positive amount after ADR; he must also pay the costs of ADR, so it is not surprising he will bring suit less often than when ADR is not required. (2) Another difference from the case where ADR is not required is that nonbinding ADR may be used. Previously, it was not used, either because it was Pareto dominated by settlement or by immediate trial. Here it may be used as a necessary prelude to trial if the parties want to go to trial.

I will not analyze the more general case because it is straightforward and because there are no unambiguous results worth noting. The only point that should be mentioned is that, in determining the expected return from nonbinding ADR, it must be kept in mind that, for the plaintiff to obtain a positive settlement after ADR, he must then have a credible threat to go to trial. This will be so after an ADR win if and only if $p_{iw} - t_\pi$ is positive, and after an ADR loss if and only if $p_{il} - t_\pi$ is positive.

[30] To see this, note that s can be as low as $x - t_\pi$, in which case the expected return from nonbinding ADR is $p_\pi x - (p_\pi t_\pi + a_\pi)$, which may be less than $p_\pi x - t_\pi$.