THE DETERRENT EFFECTS OF SETTLEMENTS AND TRIALS

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I. INTRODUCTION

It generally is taken for granted that it is better for cases to settle out of court than to go to trial because the cost of settling a case is less than the cost of trying it. Settlements clearly are superior to trials if one's goal is to minimize transaction costs. However, trials and settlements have different deterrent effects—that is, different effects on the injurer's behavior that gave rise to the dispute. This article shows that once deterrence is taken into account, trials may be superior despite their higher transaction costs.

The reasoning behind this conclusion can be explained as follows. For an out-of-court settlement to be possible, the victim's expected gain from going to trial must be less than the injurer's expected loss from trial. Any settlement amount within this range will make both parties better off than the expected trial outcome. Thus, to the extent that a potential injurer anticipates that cases will settle, he will expect to pay less and will not take as much care as he would otherwise.

This reduction in care by the injurer may or may not be socially desirable. For example, suppose the settlement amount exceeds the victim's harm (not including his litigation costs). Then, if all cases settle, an injurer will pay more than the harm he causes and will take socially excessive care. Trials would lead to even greater care since the injurer's expected payment would be higher. Thus, the reduction in the injurer's care due to settlements is socially desirable.

However, suppose the settlement amount is less than the victim's harm. Then, if all cases settle, an injurer will not pay for all of the harm he causes and will take socially inadequate care. An expectation of going to trial would lead him to take more care. Of course, whether trials are socially desirable depends on whether the social benefit from the injurer's increased care exceeds the additional transaction costs.

The preceding discussion implicitly assumed that whenever an individual suffers harm, he will sue the injurer. In general, because litigation is costly, not every
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victim will sue. When this complication is taken into account, the conclusion that trials may be superior to settlements still holds, although the interpretation of the results is slightly different.²

It should be stressed that we are not advocating that trials be used to obtain greater deterrence. Most likely there are superior instruments to accomplish this, such as raising the level of liability. Rather, the main point of this article is that settlements and trials have different deterrent effects that must be taken into account in any system designed to induce injurers to take socially appropriate care.

In Section II the deterrent effects of settlements and trials are analyzed in a general model. In Section III the results are illustrated with an example. And in Section IV some concluding remarks are made.

II. THE GENERAL PROBLEM

This section analyzes the problem faced by a social planner who is assumed to be able to choose the rate at which cases are tried or settled. Although in practice there is no single policy instrument corresponding to the trial-settlement rate, there are many rules and procedures governing the litigation process that can affect the probability that a case will settle out of court.³

In the model used to study this problem, there is one risk-neutral injurer and a continuum of risk-neutral victim types. For each victim type, the injurer’s choice of care affects both the probability of harm and the magnitude of harm. The governing legal rule is strict liability. If harm occurs and the case goes to trial, it is assumed that the victim will win.⁴ Following the American practice, each side bears its own litigation costs. If the case settles out of court, it is assumed for simplicity that no costs are incurred in the settlement process. Let:

\[ c = \text{injurer's level of care} \]
\[ z = \text{index of victim types (0} \leq z \leq 1) \]
\[ p(c, z) = \text{probability of harm to victim of type } z \ (p_1 < 0, p_2 > 0, p_{11} > 0) \]
\[ h(c, z) = \text{harm to victim of type } z \ (h_1 < 0, h_2 > 0, h_{11} > 0) \]
\[ f(z) = \text{probability density of } z \]
\[ \alpha = \text{each victim's cost of litigation} \]
\[ \beta = \text{injurer's cost of litigation per trial} \]
\[ s = \text{probability of settlement, given suit} \]

All of these variables and functions are assumed to be known to both parties.⁵

If a victim’s loss exceeds his litigation cost, he will sue since he will recover more than his litigation cost. This decision does not depend on the probability of the case settling, since any settlement will make him even better off. If the victim’s loss is less than his litigation cost, the injurer would not be willing to pay anything in a settlement since the victim’s threat to pursue the case at trial would not be credible. Thus, a victim will sue if and only if his loss exceeds his litigation cost:⁶

\[ h(c, z) > \alpha. \] (1)

Given the injurer’s care \( c \), the victims who bring suit can be identified as having a value of \( z \) greater than some \( z(c) \), where \( z(c) \) is defined implicitly by:
In other words, only victims with relatively high losses—exceeding $h(c, z(c))$—will sue.

If a suit is brought and the case settles out of court, the settlement amount will be greater than the victim's gain from trial net of his litigation costs, but less than the injurer's loss from trial, including his litigation costs. Since the victim's net gain from trial is $h(c, z) - \alpha$, while the injurer's total loss is $h(c, z) + \beta$, let the settlement amount be:

$$h(c, z) - \alpha + \theta(\beta + \alpha),$$

where

$$\theta = \text{index of victim's bargaining strength (0 < \theta < 1)}.$$  

Note that if $\theta$ is sufficiently low, the settlement amount will be less than the victim's harm, while if $\theta$ is sufficiently high, the settlement amount will exceed the victim's loss.

The injurer chooses care to minimize the sum of his cost of care and his expected payment resulting from suits. If there is a suit and a trial, the injurer pays $h(c, z) + \beta$, but if there is a suit and a settlement, he pays $h(c, z) - \alpha + \theta(\beta + \alpha)$. Therefore, the injurer's expected payment given a suit is:

$$(1 - s)[h(c, z) + \beta] + s[h(c, z) - \alpha + \theta(\beta + \alpha)]$$

$$= h(c, z) + \beta - s(1 - \theta)(\beta + \alpha).$$

The injurer's problem is to:

Minimize $c + \int_0^1 p(c, z)[h(c, z) + \beta - s(1 - \theta)(\beta + \alpha)] f(z) \, dz$.

Let $c(s)$ be the optimal choice of care by the injurer, given the settlement rate $s$. It is straightforward to show that $c'(s) < 0$. Intuitively, this is because an increase in the settlement rate lowers the injurer's expected payment at each level of care (see (4)), which induces him to take less care.

The social problem is to choose the settlement rate $s$ that minimizes social costs $W$—the sum of the cost of care, the expected harm, and the expected cost of litigation:

Minimize $W(s) = c(s) + \int_0^1 p(c(s), z)[h(c(s), z)f(z) \, dz$

$$+ \int_{s(c)}^1 p(c(s), z)(1 - s)(\beta + \alpha)f(z) \, dz.$$}

Let $s^*$ be the solution to this problem.

The question focused on is whether trials can be superior to settlements—that is, whether $s^* < 1$. To answer this question, consider the derivative of $W(s)$ at $s = 1$:

$$W'(1) = c'(1) + \int_0^1 [p_1(c, z)[h(c, z) + p(c, z)h_1(c, z)]c'(1)f(z) \, dz$$

$$- \int_{s^*(1)}^1 p(c, z)(\beta + \alpha)f(z) \, dz.$$
This derivative has the following interpretation. As the settlement rate falls from \( s = 1 \), the injurer’s level of care rises (since \( c'(s) < 0 \)). This raises the cost of care (the first term on the right-hand-side of (7)) and lowers the expected harm (the second term). The fall in the settlement rate also increases litigation costs (the third term). If the reduction in expected harm exceeds the increase in the cost of care and in litigation costs, then a positive probability of going to trial is socially optimal. In other words, if \( W'(1) > 0 \), then \( s^* < 1 \).

To better understand when trials create socially valuable deterrence, assume for the moment that every individual who is harmed brings suit.\(^9\) Then, whether trials are desirable depends on the relationship between the settlement amount and the victim’s loss.

Suppose first that the settlement amount equals the victim’s loss.\(^{10} \) If this holds, it is optimal for all cases to settle \( (s^* = 1) \). Because the injurer is sued by every individual who is harmed and pays a settlement amount equal to each victim’s loss, the injurer will choose the first-best level of care (the level of care that minimizes the sum of the cost of care and the expected harm). And because there will not be any litigation costs, the first-best outcome (the first-best level of care with no expenditure on litigation) will be achieved.

Similar reasoning implies that it is optimal for all cases to settle if the settlement amount exceeds each victim’s loss. Then, if \( s = 1 \), the injurer will take excessive care relative to the first-best level of care (since he pays more than the harm he causes). Lowering \( s \) is undesirable because the injurer would take even more care and litigation costs would occur.

Suppose, however, that the settlement amount is less than each victim’s loss. Then, if \( s = 1 \), the injurer will not take adequate care relative to the first-best level of care. Lowering \( s \) will cause the injurer to take more care; but lowering \( s \) will introduce litigation costs. In this situation, it will be valuable to have some trials if the benefit associated with the increased deterrence outweighs the litigation costs. Thus, when every individual who is harmed brings suit, a necessary condition for trials to be socially desirable is that the settlement amount is less than each victim’s loss.

Because litigation is costly, not every individual who suffers harm will bring suit. As a result, even if all the suits that are brought settle for an amount equal to each victim’s loss, the injurer’s care would not equal the first-best level of care.\(^{11} \) More generally, therefore, a necessary condition for trials to be socially valuable is that the injurer’s care would be less than the first-best level of care if all cases settled. When every individual who is harmed brings suit, this is equivalent to the condition that the settlement amount is less than each victim’s loss.

III. AN EXAMPLE

In the example in this section (i) the injurer’s care affects the number of victims, but not each victim’s harm, \( h \); and (ii) each victim’s harm exceeds his litigation cost, so that whenever harm occurs there will be a suit. The notation will be the same as in Section II except as noted below.

The sum of the cost of care, \( c \), and the aggregate harm, \( H \), is given by:

\[
c + H = k_1 - k_2 c,
\]

where \( k_1 \) and \( k_2 \) are positive constants and \( c \) is assumed to be less than or equal to some upper bound \( c < k_1/(k_2 + 1) \).\(^{12} \) Since the sum of the cost of care and
aggregate harm decreases as care increases, the first-best level of care is \( \tilde{c} \). The number of victims, \( N(c) \), can be determined by solving (8) for \( H \) and then dividing by \( h \):

\[
N(c) = \left[ k_1 - (k_2 + 1)c \right]/h. \tag{9}
\]

The injurer’s problem, corresponding to (5) in the general case, is:

\[
\text{Minimize } \quad c + N(c)[h + \beta - s(1 - \theta)(\beta + \alpha)], \tag{10}
\]

where the expression in brackets is the injurer’s expected payment given suit (see (4) above). It is easily shown that the optimal choice of care by the injurer is:

\[
c^* = \begin{cases} 
0 & \text{if } s > s^o, \\
\tilde{c} & \text{if } s \leq s^o,
\end{cases} \tag{11}
\]

where

\[
s^o = \left[ \left( h/(k_2 + 1) \right) - h - \beta \right]/(\theta - 1)(\beta + \alpha). \tag{12}
\]

As expected, the injurer takes less care when the settlement rate, \( s \), is high.

The social problem, corresponding to (6), is:

\[
\text{Minimize } \quad W(s) = c + H + N(c)(1 - s)(\beta + \alpha), \tag{13}
\]

subject to the constraint that the injurer chooses care according to (11).

There are two cases to consider. If \( s > s^o \), zero care is chosen and social costs are:

\[
k_1 + (k_1/h)(1 - s)(\beta + \alpha). \tag{14}
\]

Since (14) is decreasing in \( s \), the socially optimal settlement rate in this range is \( s = 1 \); then social costs are \( k_1 \).

If \( s \leq s^o \), the injurer chooses care equal to \( \tilde{c} \) and social costs are:

\[
\tilde{c} + \left[ k_1 - (k_2 + 1)\tilde{c} \right] + \left[ k_1 - (k_2 + 1)\tilde{c} \right]/h(1 - s)(\beta + \alpha). \tag{15}
\]

Since (15) is decreasing in \( s \), the optimal settlement rate in this range is \( s = s^o \); then social costs are (15) with \( s^o \) substituted for \( s \).

A comparison of social costs in the two cases shows that \( s = s^o \) is preferred to \( s = 1 \) if and only if:

\[
\left[ k_1 - (k_2 + 1)\tilde{c} \right]/h(1 - s^o)(\beta + \alpha) < k_2\tilde{c}. \tag{16}
\]

This result can be interpreted as follows. If the settlement rate is \( s = s^o \), then the sum of the cost of care and aggregate harm is \( k_1 - k_2\tilde{c} \) (see (8)), whereas if the settlement rate is \( s = 1 \), this sum is \( k_1 \). Thus, the deterrent benefit of trials is \( k_2\tilde{c} \). However, this benefit is obtained at the expense of an increase in litigation costs.
equal to \((k_1 - (k_2 + 1)e)/h(1 - s^*)(\beta + \alpha)\). Thus, (16) states that trials are socially desirable if and only if the increase in litigation costs is less than the deterrent benefits.

It is clear from (16) that the optimal settlement rate could be \(s = 1\) or \(s = s^*\). For example, if both parties’ litigation costs are zero \((\beta = \alpha = 0)\), the left-hand side of (16) is zero and the optimal settlement rate is \(s^* < 1\). (Obviously, \(s^*\) still would be optimal if litigation costs are positive but relatively small.) Alternatively, if the sum of the parties’ litigation costs is very large, (16) shows that the optimal settlement rate would be \(s = 1\).

Since in the example everyone who suffers harm brings suit, the discussion in the previous section suggests that a necessary condition for trials to be socially desirable is that the settlement amount is less than each victim’s loss. This can be shown by observing that if the settlement amount equals or exceeds each victim’s loss, then \(s^* = 1\); the details are omitted here.\(^{13}\)

IV. CONCLUDING REMARKS

The analysis in this article presumed certain things about the legal system—that the prevailing legal rule is strict liability, that the level of liability equals the victim’s loss, and that legal fees are allocated according to the American practice. This section considers some alternative assumptions.

(i) If the legal rule is negligence, injurers would have an incentive to meet the applicable standard of care in order to be found non-negligent. However, to the extent that they expect cases to settle rather than to go to trial, their expected payment if they do not meet the standard falls. Consequently, some injurers may choose to not meet the standard—that is, they may choose to take less care. Since a higher settlement rate would imply less care, the basic points of the article still would apply.\(^{14}\)

(ii) If the level of liability is allowed to differ from the victim’s loss, then it would be possible within the model to achieve any desired degree of deterrence even when all cases settle. For example, if an injurer’s care would otherwise have been inadequate when all cases settle, an appropriate upward adjustment to the level of liability will raise the settlement amount and lead the injurer to take the desired amount of care. However, if the adjustment is constrained by considerations not taken into account here (e.g., fairness and wealth limits), then the potential deterrent benefit of trials would be relevant.

(iii) If legal fees are allocated according to the British practice (the losing party pays the legal fees of both sides), then a victim who anticipates prevailing at trial—as was assumed here—will sue regardless of the size of his loss. The settlement amount will be between the loss and the loss plus the parties’ joint litigation costs. Since the settlement amount generally will exceed the loss, the injurer will be over deterred even if all cases settle. Obviously, the additional deterrence from trials is not desirable. However, if the victim would prevail at trial only with some probability, the settlement amount could be less than his loss and the extra deterrence provided by trials might be worth the extra litigation costs.

Although the main point of this article has been that trials can provide socially desirable deterrence despite their higher transaction costs, this point was emphasized principally for pedagogical reasons. In practice, there probably are better ways to encourage deterrence (such as changing the level of liability). To choose among these, however, it still will be necessary to take into account the effect of the rate of settlement on deterrence.
NOTES

1. The widespread acceptance of this argument is indicated by the following passage from Coleman and Silver (1986, pp. 102–103): "Most lawyers, judges, and law professors think it is good that so few cases are tried. . . . The reasons most commonly given for discouraging trials are that settlements conserve resources and enable parties to resolve their differences amicably. Settlements are said to reduce attorneys' fees and court costs, free space on crowded dockets, speed relief to injured plaintiffs, and avoid the need for judges to decide difficult legal questions" [Footnotes omitted]. However, not everyone clearly favors settlements over trials. See, for example, Fiss (1984) and the article by Coleman and Silver just quoted. See also Miller (1987).

2. To our knowledge the only other articles that simultaneously consider the settlement-trial decision and deterrence are Gravelle (1987a, 1987b), P'ng (1987), and Simon (1985). However, they treat the rate at which cases are settled as an endogenous variable.

* For example, P'ng's focus is on how the injurer's care and the settlement rate are jointly determined by the standard of care under a negligence rule, the level of the award, and the level and allocation of litigation costs.

3. For example, Rule 16 of the Federal Rules of Civil Procedure provides for sanctions on parties if they do not participate in pretrial conferences designed to facilitate the settlement of the case. Similarly, Rule 68 imposes legal costs on parties who reject a settlement offer that later proves to be more favorable to them than the trial outcome. See generally Posner (1986, pp. 525–527, 540–542) and the references cited therein.

4. There is no loss of generality in assuming that the victim wins. If the probability of prevailing were less than one, all of the results of the article would apply with "the judgment" replaced by "the expected judgment".

5. This is a stronger assumption than is needed, but it is made in order to avoid complications associated with asymmetric information. See, for example, note 7 below.

6. This is essentially the same condition that Shavell (1982) derived in his study of suit, settlement, and trial. However, under different assumptions, the victim's decision to sue may depend on the likelihood and/or magnitude of a settlement. See, for example, Becheluk (1988).

7. Since the injurer and the victim are both assumed to know all of the relevant variables (including the trial outcome and the magnitude of the loss), a settlement amount exists within the bounds discussed in the text. One might wonder then why any case would go to trial. The most natural explanation is that the parties have divergent expectations about the trial outcome and/or the magnitude of the loss. However, to take account of divergent expectations would greatly complicate the analysis without affecting the basic point of the article.

8. Since $p_{11} > 0$ and $h_{11} > 0$, the appropriate second-order condition is satisfied. (Analogous conditions are satisfied elsewhere in the article.)

9. This is equivalent to assuming that the loss, $h(c, z)$, exceeds litigation costs, $c$, for all $c$ and $z$.

10. For example, this would occur if the injurer's and the victim's litigation costs are the same and the parties have equal bargaining power.

11. That the injurer's care could be less than the first-best level of care is not surprising since the injurer will not have to compensate victims who do not sue. However, the injurer's care might exceed the first-best level of care because, by taking more care, the injurer can reduce the number of victims who sue. See generally Polinsky and Rubinfeld (1988).

12. This upper bound assures that aggregate harm will be strictly positive; otherwise the example would be uninteresting.

13. If the settlement amount, $h - \alpha + \theta(\beta + \alpha)$, equals or exceeds $h$, then $\theta(\beta + \alpha) \geq \alpha$. This condition implies that $\lambda \geq 1$, which in turn implies that the injurer will choose care equal to $c$, the first-best level of care, regardless of the choice of $s$ (see (11)). Thus, there would be no benefit from setting $s$ less than one, but there would be litigation costs.

14. It is implicitly assumed in this paragraph that injurers differ in terms of the cost of taking care and that the standard of care is the same for everyone (say because of the
difficulty in observing the differences among injurers). If the standard can be varied across injurers, the first-best outcome could be achieved by setting the settlement rate at zero. Then, each injurer would meet the applicable standard of care, and no suits would be brought.

REFERENCES


Gravelle, H.S.E., "Accidents and the Allocation of Legal Costs with an Uninformed Court," unpublished manuscript, Department of Economics, Queen Mary College, University of London, November 1987b.


