SUING SOLELY TO EXTRACT A
SETTLEMENT OFFER

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Abstract

In many disputes, the expected value to the potential plaintiff of going to trial is negative -- either because the chances of winning are small (a "frivolous" suit) or because the expected litigation costs are large relative to the amount at stake. Although such potential plaintiffs do not go to trial, they do sue when they hope to extract thereby a settlement offer from the defendant. But why would the defendant in such a case ever offer to settle? The explanation on which this paper focuses is one based on the presence of informational asymmetry: the defendant might not know whether or not the plaintiff will go to trial if no settlement is reached.

The paper develops a model of how, in the presence of such uncertainty, the defendant will decide whether or not to make a settlement offer (and, if so, how much to offer). The analysis identifies the factors that determine: (i) whether a plaintiff who does not intend to go to trial will nonetheless succeed in extracting a settlement offer; and (ii) how much will such a plaintiff succeed in extracting. The analysis also identifies the effect that the presence of such negative-expected-value suits has on the resolution of suits by plaintiffs who do intend to go to trial if no settlement is reached.

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I.   INTRODUCTION

In many disputes, the potential plaintiff recognizes that the expected value to him of going to trial is negative. This might be the case either because the chances of winning a trial are small (the suit is "frivolous") or because the expected judgment is small relative to the expected litigation costs. In such situations, however, the negative expected value of litigation might not deter the plaintiff from suing: the plaintiff might sue -- hoping to extract a settlement offer from the defendant, and planning to drop the case if the defendant does not make such a settlement offer.

Suing solely in order to extract a settlement offer is rational, of course, only if there is some likelihood that the defendant will make such an offer. Why will the defendant offer to settle, however, if the expected value to the plaintiff of going to trial is negative? The explanation on which this paper focuses is one based on the presence of informational asymmetry. The plaintiff might have some private information concerning the expected value to him of going to trial. For example, the plaintiff might have private information concerning the level of damages that he suffered as a result of the defendant's actions, or concerning his expected litigation costs (including out-of-pocket expenses, the costs of the plaintiff's own time, the costs of the delay involved, and psychic costs). Consequently, a defendant might not know what the expected value of litigation to the plaintiff is, and thus also whether or not the plaintiff will go to trial if no settlement is reached.[1]

In the last few years, much attention has been devoted to developing formal models of settlement and litigation decisions under imperfect

information (see, e.g., Bebchuk (1984), P'ng (1983), Reinganum and Wilde (1985), Salant (1984), and Samuelson (1983)). In all these models, however, it was assumed that a trial will always take place if a settlement is not reached. To the extent that the defendant was assumed to face uncertainty about the expected value to the plaintiff of going to the trial, the uncertainty was assumed to be only about the size of this expected value but not about its sign: it was assumed that this expected value is necessarily positive. Thus, the literature has left unexplored the issue of how settlement decisions are affected by uncertainty as to whether the plaintiff will go to trial if the defendant refuses to settle.

This paper therefore develops a model of how, in the presence of such uncertainty, a defendant will decide whether to make a settlement offer, and, if so, how much to offer. On the one hand, the defendant will reason, the plaintiff might have a negative-expected-value (NEV) suit, in which case offering to settle would be wasteful since the plaintiff would not go to trial anyway. On the other hand, the plaintiff might have a positive-expected-value (PEV) suit, in which case making a settlement offer would possibly prevent litigation and produce a beneficial settlement. The analysis identifies the factors that determine: (i) whether a plaintiff who does not intend to go to trial will nonetheless succeed in extracting a settlement offer; and (ii) how much will such a plaintiff succeed in extracting.

The analysis also identifies the effect that the presence of NEV suits has on the resolution of PEV suits. The fact that defendants take into account the possibility that the plaintiff's suit is a NEV one (and that the plaintiff will thus drop the case in the event that no settle-

ment is reached) hurts those plaintiffs that do have a PEV suit. It is shown that the presence of NEV suits reduces the settlement amounts offered to plaintiffs with PEV suits and consequently increases the proportion of PEV suits that end up in a trial.

II. THE MODEL

A. Sequence of Events

A risk-neutral plaintiff files a suit against (or, more generally, makes a demand to) a risk-neutral defendant. Filing the suit (or making the demand) is assumed to be costless.

The subsequent sequence of events is as depicted in Figure 1 below. Following the suit, the defendant decides whether to offer to settle, and, if so, what settlement amount to offer. A decision to refrain from making a settlement offer will be referred to as a decision to offer a settlement amount 0.

Following the defendant's decision, the plaintiff decides how to respond. If the defendant offers some positive settlement amount, the plaintiff will have to decide whether to accept the offered settlement amount or go to trial. If the defendant does not offer to settle, the plaintiff will have to decide whether to drop the case (i.e., accept a settlement amount 0) or go to trial.

B. The Consequences of a Trial

The parties' decisions are made against the background of a potential trial, which would involve litigation costs. The plaintiff esti-
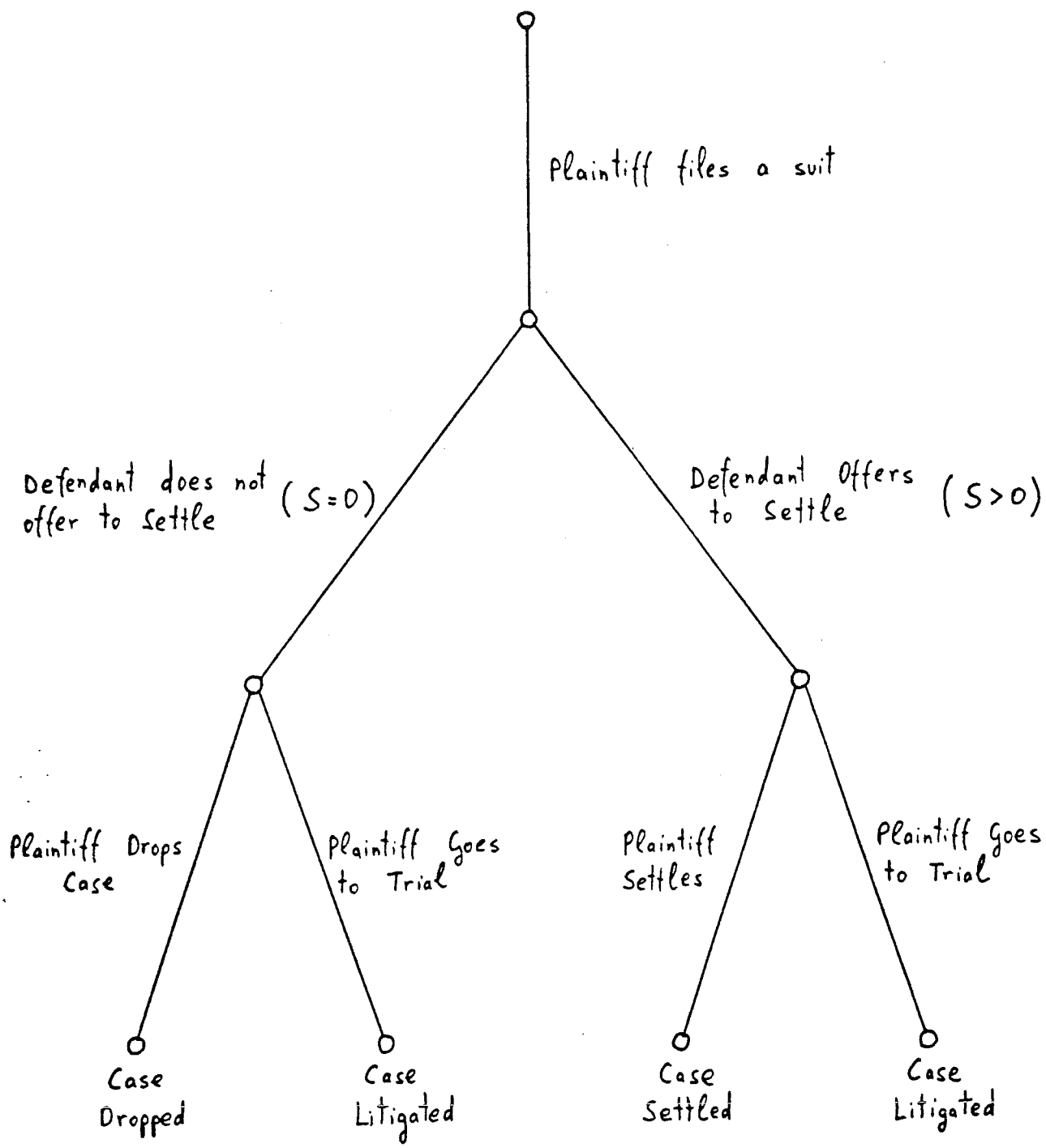
Plaintiff files a suit

Defendant does not offer to settle $(S=0)$

Defendant Offers to Settle $(S>0)$

Plaintiff Drops Case

Plaintiff Goes to Trial

Plaintiff Settles

Plaintiff Goes to Trial

Case Dropped

Case Litigated

Case Settled

Case Litigated

FIGURE 1 : SEQUENCE OF ACTIONS

mates that, in the event of a trial, the expected judgment will be W and his expected litigation costs will be C_p. Let $V = W - C_p$ denote the plaintiff's estimate of the expected value to him of going to trial. A plaintiff with an estimate V will be referred to as one of type V.

The situation to be considered is one in which the plaintiff has some private information about V. It will be assumed at this stage that the plaintiff has private information only about W, and that the defendant knows C_p. The Appendix extends the analysis to the case where the plaintiff might have private information about both W and C_p.

The defendant, then, does not know V, the plaintiff's type, but only the distribution from which V is drawn.[2] Specifically, the defendant knows that V is distributed with a density function $f(\cdot)$ and a cumulative distribution function $F(\cdot)$. It is assumed that $f(\cdot)$ is continuous and differentiable throughout, and that its value is positive in the interval $(-K_1, K_2)$, where $K_1, K_2 > 0$, and zero outside this interval.

Let us denote by α the likelihood that the plaintiff has a NEV suit; that is, $\alpha = F(0)$. Also, let us denote by $g(\cdot)$ and $G(\cdot)$ the density and cumulative distribution of V conditional on $V > 0$. Thus, for any $X \geq 0$ we have

(1a) $f(x) = (1-\alpha)g(x)$; and

(1b) $F(x) = \alpha + (1-\alpha)G(x)$.

Finally, C_d will denote the defendant's estimate of his expected litigation costs in the event of a trial. (The plaintiff might or might not know C_d.)

C. The Parties' Decisions

Consider first the plaintiff's decision whether to accept a settlement amount S. Clearly, the plaintiff will accept S if and only if[3]

(2) $S \geq V.$

Thus, the plaintiff will accept the offer if and only if his type is lower than S, the "borderline" type. In particular, a settlement amount 0 will be accepted (i.e., a refusal to settle will lead to the plaintiff's dropping the case) if and only if the plaintiff's suit is a NEV one.

Turn now to the defendant's decision concerning which settlement amount S to offer. The defendant knows that, if he offers an amount S, it will be accepted with a probability F(S) and rejected with a probability 1-F(S). In the latter case, a trial will take place and the defendant's estimate of the expected judgment in such a trial is

(3) $E(W \; / \; V > S) = E(V+C_p \; / \; V > S) = \int_S^{K_2}(x + C_p)f(x)dx.$

Thus, the defendant's position if he offers a settlement amount S will be

(4a) $A(S) = -F(S) \cdot S - [1-F(S)][C_d + \int_S^{K2}(x+C_p)\frac{f(x)}{1-F(S)}dx],$

or, equivalently,

(4b) $A(S) = -[\alpha + (1-\alpha)G(S)] \cdot S -$
$- [1 - \alpha - (1-\alpha)G(S)][C_d + \int_S^{K_2}(x+C_p)\frac{f(x)}{1-\alpha-(1-\alpha)G(S)}dx].$

The defendant will choose S to solve

(5) $\max_S A(S).$

Differentiating (4a) with respect to S and rearranging terms we get

(6a) $A'(S) = -F(S) + (C_p + C_d)f(S),$

or, equivalently,

(6b) $A'(S) = -[\alpha + (1-\alpha)G(S)] + (C_p + C_d)(1-\alpha)g(S).$

The first term on the right-hand-side of (6a) or (6b) represents the marginal cost of increasing S: there is a likelihood of $F(S) = \alpha + (1-\alpha)G(S)$ that the plaintiff would accept the increased offer and would have accepted it even without the increase.

The second term on the right-hand-side of (6a) or (6b) represents the marginal benefit of increasing S. Such an increase in S would reduce the likelihood of litigation by $f(S) = (1-\alpha)g(S)$. And observe that litigating against a plaintiff of the borderline type instead of settling with him involves a loss of $(C_p + C_d)$ to the defendant; for if the plaintiff is of the borderline type, the settlement amount will give the defendant all of the settlement gains $(C_p + C_d)$.

D. When will a NEV Suit Succeed?

Since a plaintiff with a NEV suit will in no case go to trial, a NEV suit will be successful if and only if $S^* > 0$ -- that is, if and only if the defendant elects to offer a positive settlement amount.

Proposition 1: (a) A necessary and sufficient condition for the defendant to offer a positive settlement amount is that there exists some S > 0 for which

(7) $[\alpha + (1-\alpha)G(S)] \cdot S < (1-\alpha)G(S)[Cd + \int_0^S (x + C_p)\frac{g(x)}{G(S)}dx].$

(b) A sufficient condition for the defendant to offer a positive settlement amount is that

$$(8) \qquad \alpha < \frac{(C_p + C_d) \cdot g(0)}{1 + (C_p + C_d) \cdot g(0)} \qquad .$$

Proof: (a) S* is positive if and only if there exists some S > 0 for which A(S) > A(0). Using (4a) and rearranging terms gives (7).

(b) (8) implies that the value of A'(S) (see (4b)) is positive at S = 0. It follows that (8) implies that S* > 0. Q.E.D.

Corollary 1: An increase in either C_p or C_d will make it more likely that the defendant will offer a positive settlement amount to the plaintiff.

Remark: An increase in either C_p or C_d increases (for any $S \geq 0$) the marginal benefit of increasing S (see (6a) and (6b)). This is because the gain from settling with a plaintiff of the borderline type instead of litigating with him is equal to $(C_p + C_d)$.

Proof: An increase in either C_p or C_d increases the right-hand-side of (7) and does not affect the left-hand-side of (7). Therefore, such an increase makes it more likely that (7) will hold. Q.E.D.

Corollary 2: An increase in the likelihood that the plaintiff's suit is a NEV one (i.e., an increase in α) will make it less likely that the defendant will offer a positive settlement amount.

Remark: For any S, increasing α both raises the marginal cost of increasing S and decreases the marginal benefit of increasing S (see (6a) and (6b)). First, increasing α raises the marginal cost of increasing S because it increases the likelihood that the plaintiff would accept the settlement offer even without the marginal increase in S. Second, increasing α lowers the marginal benefit of raising S because it increases the extent to which this marginal increase in S would lower the likelihood of litigation.

Proof: An increase in α will increase the left-hand-side of (7) and will decrease the right-hand side of (7). Therefore, such an increase will make it less likely that (7) will hold. Q.E.D.

E. How Much will a Successful NEV Suit Yield?

When (7) holds, a plaintiff who does not intend to go to trial will nonetheless succeed in extracting a positive settlement amount from the defendant. Let us now examine the factors that shape the size of that settlement amount.

Proposition 2: If the defendant elects to offer a positive settlement amount, that settlement amount will be characterized by

$$(9) \qquad \alpha + (1-\alpha)G(S^*) = (C_p + C_d)(1-\alpha)g(S^*); \text{ and}$$

$$(10) \qquad \frac{g'(S^*)}{g(S^*)}(C_p + C_d) < 1.$$

Remark: Equation (9) is the first-order condition; it implies that at the defendant's optimal settlement offer the marginal cost and benefit of increasing the offer are equal. Equation (10) is the second-order condition.

Proof: In the situation under consideration, the optimal settlement offer S^* is interior to the interval $(0, K_2)$, because we assume that (7) holds and hence $S^* > 0$, and because $A'(S)$ (see (6a)) is negative at K_2. Consequently, at S^* the first-order and second-order conditions must hold. Requiring that $A'(S)$ be equal to zero at S^* gives (9). Differentiating $A'(S)$ with respect to S, rearranging terms, and requiring negativity at S^* gives (10). Q.E.D.

Corollary 1: An increase in either C_p or C_d will raise the amount that a successful NEV suit will yield.

Remark: As already explained, an increase in either C_p or C_d will raise the marginal benefit of increasing S.

Proof: Differentiating (9) with respect to $(C_p + C_d)$ and rearranging terms gives

$$(11) \qquad \frac{\partial S^*}{\partial (C_p + C_d)} = \frac{1}{1 - (C_p + C_d)\frac{g'(S^*)}{g(S^*)}} .$$

And the second-order condition (10) implies that the right-hand side of (11) is positive. Q.E.D.

Corollary 2: An increase in the likelihood that the plaintiff's suit is a NEV one (an increase in α) will reduce the amount that a successful NEV suit will yield.

Remark: As already explained, increasing α will both raise the marginal cost of increasing S and lower the marginal benefit of increasing S.

Proof: Differentiating (9) with respect to α and rearranging terms gives

$$(12) \qquad \frac{\partial S^*}{\partial \alpha} = - \frac{(C_p + C_d) + (1 - G(S^*))}{(1-\alpha)[1 - (C_p + C_d)\frac{g'(S^*)}{g(S^*)}]} .$$

And the second-order condition (10) implies that the right-hand side of (12) is negative. Q.E.D.

F. The Effect of NEV Suits on the Resolution of PEV Suits

Let us now turn to the effect that the presence of NEV suits has on the resolution of PEV suits.

<u>Proposition 3</u>: In comparison to the situation that would obtain if there were no NEV suits, the presence of NEV suits (a) **lowers the set-** tlement amounts for which PEV are settled; and (b) **increases the propor-** tion of PEV suits that are not settled but rather lead to trial.

<u>Remark</u>: The intuition behind the two parts of the Proposition is as follows. (a) As is clear from the remark explaining Corollary 2 of Proposition 2, the possibility that the suit is a NEV one leads defen- dants to offer lower settlement amounts than they would otherwise offer.

(b) Because the presence of NEV suits lowers the settlement amounts offered by defendants, it increases the likelihood that a plain- tiff with a PEV suit will reject the offer made to him and go to trial.

<u>Proof</u>: (a) Proposition 1(b) and Corollary 2 of Proposition 2 indicate that S^* is lower than what it would be if α were equal to 0 -- that is, if there were no likelihood that the plaintiff's suit is a NEV one.

(b) The likelihood that a PEV suit will lead to trial is $1-G(S^*)$, which obviously increases as S^* is lowered.

III. CONCLUDING REMARKS

1. The analysis of this paper suggests a main way in which legal rules and institutions affect the incidence and success of suits solely aimed at extracting a settlement offer. As was shown, the possibility of bringing a successful NEV suit is facilitated by the presence of informational asymmetry concerning the value to the plaintiff of going to trial. Various legal rules and institutions affect, of course, the extent to which such an informational asymmetry might be present. For example, discovery rules often enable the defendant to learn some of the

plaintiff's private information concerning the expected outcome of a trial. Rules and institutions which reduce such informational asymmetries are likely to make it more difficult for NEV suits to be successful (and thus also to increase the proportion of PEV suits that will be settled).

2. An important issue of interest that the model leaves unexamined is that of information transmission. The model's assumption that the defendant is the only party that makes settlement offers is used to rule out the possibility of defendants' learning from plaintiffs' demands: if the plaintiff were to make a settlement demand, the defendant might infer from it some information concerning the plaintiff's type, and the informational asymmetry might be consequently reduced. This possibility of information transmission through plaintiffs' demands is an issue that should be treated in a complete model of suits by plaintiffs who will not go to trial if the defendant does not settle.

APPENDIX

This Appendix extends the analysis to the case where the plaintiff might have private information not only about W but also about C_p.

Consider, under the new assumption, the defendant's choice of S. The defendant knows that an offer S will be accepted with a probability $F(S)$ and rejected with a probability $1 - F(S)$. In the latter case, a trial will take place and the defendant's estimate of the expected judgment in such a trial is

(A1) $\quad E(W \, / \, V{>}S) = E(V + C_p \, / \, V{>}S) =$

$\quad E(V \, / \, V{>}S) + E(C_p \, / \, V{>}S) =$

$$\int_S^{K_2} x \, \frac{f(x)}{1-F(S)} dx + \int_S^{K_2} E(C_p \, / \, V{=}x) \frac{f(x)}{1-F(S)} dx.$$

Thus, the defendant's expected position if he offers a settlement amount S will be

(A2) $\quad A(S) = -F(S){\cdot}S - [1-F(S)][C_d + \int_S^{K_2} E(C_p \, / \, V{=}x)\frac{f(x)}{1-F(S)} dx + \int_S^{K_2} x \, \frac{f(x)}{1-F(S)} dx,$

or, equivalently,

(A3) $\quad A(S) = -[\alpha+(1-\alpha)G(S)]{\cdot}S -$

$$- [1-\alpha-(1-\alpha)G(S)][C_d + \int_S^{K_2} E(C_p \, / \, V{=}x)\frac{f(x)}{1-F(S)} dx + \int_S^{K_2} x \, \frac{f(x)}{1-F(S)} dx].$$

The defendant will of course choose S to maximize the value of A(S). Differentiating the right-hand side of (A2) with respect to S gives

(A4) $\quad A'(S) = -F(S) + f(S)[C_d + E(C_p \, / \, V{=}S)],$

or, equivalently,

(A5) $A'(S) = -[\alpha+(1-\alpha)G(S)] + (1-\alpha)g(S)[C_d+E(C_p / V=S)]$.

The interpretation of (A4) and (A5) is similar to that of (6a) and (6b). The first term on the right-hand side of (A4) or (A5) represents the marginal cost of increasing S: there is a likelihood of $F(S) = \alpha + (1-\alpha)G(S)$ that the plaintiff would accept the increased offer and would have accepted the offer even without the marginal increase. The second term on the right-hand side of (A4) or (A5) represents the marginal benefit of increasing S. Such an increase in S would reduce the likelihood of litigation by $f(S) = (1-\alpha)g(S)$; and litigating against a plaintiff of the borderline type instead of settling with him would involve a loss of $[C_d + E(C_p / V=S)]$.

Proceeding in a similar way to that followed in Section II, the following propositions and corollaries can be proved.

Proposition A1:   (a) A necessary and sufficient condition for the defendant to offer a positive settlement amount is that there exists some S > 0 for which

(A6) $[\alpha+(1-\alpha)G(S)] \cdot S < (1-\alpha)G(S)\{C_d + \int_0^S [E(C_p / V=x)+x] \frac{g(x)}{G(S)} dx\}$.

        (b) A sufficient condition for the defendant to offer a positive settlement amount is that

(A7) $\alpha < \dfrac{[C_d + E(C_p / V=0)] \cdot g(0)}{1 + [C_d + E(C_p / V=0)]}$.

Corollary 1: An increase in C_d will make it more likely that the defendant will offer a positive settlement amount, Similarly, an upward shift in the distribution of C_p (holding fixed the distribution of V)

will make it more likely that the defendant will offer a positive settlement amount.

<u>Corollary 2</u>: An increase in the likelihood that the plaintiff's suit is a NEV one (an increase in α) will make it less likely that the defendant will offer a positive settlement amount.

<u>Proposition A2</u>: If the defendant elects to offer a positive settlement amount, that settlement amount will be characterized by

(A8) $\alpha + (1-\alpha)G(S^*) = (1-\alpha)g(S^*)[C_d + E(C_p \ / \ V=S^*)]$; and

(A9) $\frac{g'(S^*)}{g(S^*)}[C_d + E(C_p \ / \ V=S^*)] < 1.$

<u>Corollary 1</u>: An increase in C_d will raise the settlement amount that a successful NEV suit will yield. Similarly, an upwards shift in the distribution of C_p (holding fixed the distribution of V) will increase the settlement amount that a successful NEV suit will yield.

<u>Corollary 2</u>: An increase in the likelihood that the plaintiff's suit is a NEV one (an increase in α) will reduce the amount that a successful NEV suit will yield.

<u>Proposition 3</u>: In comparison to the situation that would obtain if there were no NEV suits, the presence of NEV suits (a) lowers the settlement amounts for which PEV are settled; and (b) increases the proportion of PEV suits that are not settled but rather lead to trial.

NOTES

1.   Rosenberg and Shavell (1985) recently provided a different explanation as to why a plaintiff might succeed in extracting a settlement amount even though he does not intend to go to trial if the defendant refuses to settle. In their model, the defendant does know that the expected value of litigation to the plaintiff is negative and that consequently he would not go to trial. What drives their results is their assumption about the sequential nature in which litigation costs might be incurred. They assumed that, once a suit is filed (at no cost to the plaintiff), the defendant must incur some significant costs to defend himself, otherwise the plaintiff will win by default judgment and without incurring any litigation costs. Although the defendant knows that if he incurs the necessary defense costs the plaintiff will drop the case, it is clearly rational for the defendant to pay anything below these defense costs in order to settle the case without having to incur these defense costs. Thus, in Rosenberg and Shavell's model suits are brought for their "nuisance" value -- the plaintiff's suit puts the defendant in a position in which he would have to incur some defense costs unless the plaintiff agrees to settle beforehand, and that makes the defendant willing to pay the plaintiff for such an agreement to settle.

While Rosenberg and Shavell's explanation might well be relevant in some or many cases, it is unlikely to explain all the suits by plaintiffs who will not go to trial if the defendant refuses to settle. For in a great many cases the amount of defense costs that the defendant has to incur before the plaintiff incurs any litigation costs is very limited. In such cases, a plaintiff that has a negative-present-value suit would be able to extract a significant settlement offer only if the defendant faces uncertainty concerning the expected value to the plaintiff of going to trial.

2.   If the plaintiff is of a high type, then it will be in his interest to eliminate the informational asymmetry and to have the defendant realize that the expected judgment is high. It will be assumed, however, that the plaintiff cannot eliminate the informational asymmetry in any way which is not prohibitively costly. A statement by the plaintiff about his high estimate of the expected judgment will be disregarded unless the plaintiff provides the defendant with a verification of his high estimate. And the assumption is that the high-estimate plaintiff cannot provide such a verification, or that he cannot provide it without jeopardizing his chances should a trial take place.

3.   It is assumed for convenience that the plaintiff will settle if he is indifferent between settling and litigating; the model's results will be the same under the opposite assumption.

REFERENCES

Bebchuk, L. (1984). "Litigation and Settlement under Imperfect Information." 18 Rand Journal of Economics, pp. 404-415.

P'ng, I. (1983). "Strategic Behavior in Suit, Settlement, and Trial." 14 Bell Journal of Economics, pp. 839-550.

Reinganum, J. and L. Wilde (1985). "Settlement, Litigation and the Allocation of Litigation Costs." Division of Humanities and Social Sciences, California Institute of Technology, March.

Rosenberg, D. and S. Shavell (1985). "A Model in Which Suits Are Brought for Their Nuisance Value." 5 International Review of Law and Economics, pp. 3-13.

Salant, S. (1984). "Litigation of Settlement Demands Questioned by Bayesian Defendants." Social Science Working Paper No. 816, Division of Humanities and Social Sciences, California Institute of technology, March.

Samuelson, W. (1983). "Negotiation vs. Litigation." School of Management, Boston University, April.