

ISSN 1045-6333

ON DIVISIBILITY AND CREDIBILITY:
THE EFFECTS OF THE DISTRIBUTION
OF LITIGATION COSTS OVER TIME
ON THE CREDIBILITY OF THREATS TO SUE

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Discussion Paper No. 190

8/96

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Cambridge, MA 02138

The Center for Law, Economics, and Business is supported by
a grant from the John M. Olin Foundation.

Last revision: 7/96

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* Professor of Law, Economics and Finance, Harvard Law School. I am grateful to Omri Ben-Shahar for his valuable research assistance. I also wish to thank Andrew Guzman, Louis Kaplow, and Steve Shavell for helpful conversations and comments. For financial support, I am grateful to the National Science Foundation and to the John M. Olin Center for Law, Economics, and Business at Harvard Law School.

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Abstract

When the litigation costs of a potential plaintiff exceed the expected judgment in the case, the plaintiff's threat to sue can nevertheless succeed in extracting a settlement offer if that threat is credible. This paper analyzes how the credibility of such threats is shaped by the way in which the parties' litigation costs are expected to be distributed over time. The analysis starts by demonstrating that greater divisibility of litigation costs may help -- and can never hurt -- the plaintiff's strategic position. The analysis then identifies the strategic implications of the order in which the parties must incur the bulk of their litigation costs; it is shown that, contrary to what might be initially thought, the plaintiff will be better off if the defendant's costs must largely be incurred *after* the plaintiff's cost. Finally, for the various possible distributions of parties' costs over time, the analysis identifies necessary and sufficient conditions for the plaintiff's threat to be credible (and, therefore, to succeed in extracting a settlement.)

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I. INTRODUCTION

A negative-expected-value (NEV) suit is one in which the plaintiff's litigation costs exceed his expected judgment. Such suits seem to be quite abundant. For a plaintiff with an NEV suit to succeed in extracting a settlement offer, the plaintiff must have a credible threat to pursue his suit. The question is what can make this threat credible.

The first models of explicit pretrial bargaining have generally abstracted from the issue of NEV suits and assumed that the parties are certain that the plaintiff's suit has a positive expected value (see, e.g., Bebchuk [1984], Reinganum and Wilde [1986] and Nalebuff [1987]). Subsequent models have attempted to ground the success of plaintiffs with NEV suits in uncertainty (of one of the parties or both) as to whether the plaintiff's suit has a negative or positive value (see Bebchuk [1988], Katz [1990], and Cornell [1990]).¹

In contrast to the existing literature, this paper analyzes cases in which the parties both know that the expected judgment is lower than the plaintiff's total litigation costs. The paper demonstrates that even in such cases, the plaintiff may have a credible threat to bring an NEV suit and may be able to extract a settlement offer. The paper thus shows that the set of NEV suits that succeed in extracting settlements is much greater than is suggested by

¹ Bebchuk [1988] and Katz [1990] have suggested that a plaintiff with an NEV suit might succeed in extracting a settlement offer if the defendant does not know whether the plaintiff's expected value of litigation is positive or negative. Cornell [1990] analyses a case in which a plaintiff will bring an NEV suit because the plaintiff expects to get, at some intermediate point during the litigation process, some additional information about his chances, and getting favorable information may turn an NEV suit into one that has a positive-expected-value.

An additional model of NEV suits which was not grounded in informational issues was offered by Rosenberg and Shavell [1985]. Their model focusses on very special circumstances — a case in which, after the plaintiff files the suit at little or no cost, the defendant has to incur unilaterally a large cost of preparing the defense. Consequently, the defendant will be willing to settle for an amount not exceeding this cost of defense, even if she knows that the plaintiff would not otherwise proceed to judgement.

earlier models.

A key aspect of the model is the fact that litigation cost are not incurred all at once, but rather in stages, and that bargaining can take place at various points during this process. This divisibility of the litigation process is shown to play an important strategic role. In the presence of such divisibility, a plaintiff with an NEV suit may have a credible threat and may extract a settlement offer. In particular, the result provided by the analysis is that any increase in divisibility can only improve the plaintiff's position: it may help to establish -- and can never undermine -- the credibility of the plaintiff's threat.²

A major focus of the paper is the analysis of how, given that the litigation process is divided into a number of stages, the credibility of the plaintiff's threat is affected by the distribution of the parties' litigation costs over the various stages. The results obtained are surprising. At first glance, it might be conjectured that the plaintiff is better off (that is, more likely to have a credible threat) if he must incur most of his costs after the defendant has to incur most of her costs. The paper demonstrates, however, that this conjecture is false. The plaintiff will be better off if he must incur the weight of his litigation costs before, rather than after, the defendant must incur the weight of her litigation costs.

The analysis also identifies necessary and sufficient conditions for the plaintiff's threat to be credible. Given that credibility depends on the way in which litigation costs are

² The insight that the divisibility of the litigation process provides credibility to the plaintiff's threat is also suggested by a companion paper, Bebchuk [1996]. But the companion paper, which is aimed for a legal audience, does not provide the main analytical results produced by the model of this paper. The companion paper does not provide a proof that an increase in divisibility can never hurt the plaintiff. Furthermore, and importantly, the companion paper (which for simplicity focusses on the special case in which costs are distributed uniformly over time) does not analyze how credibility is affected by the shape of the distributions of the parties' costs over time -- which is a central focus of the analysis and results of this paper.

expected to be distributed over time, conditions are identified both for the set of all distributions and for subsets of it. These results enable a partition of the universe of NEV suits into those that do, and those that do not, give rise to credible threats.

The paper is organized as follows. Section II describes the framework of the analysis. Section III describes the equilibrium outcome of the bargaining game and derives the general condition for credibility of NEV suits. Section IV focusses on the effect of divisibility and establishes the result that greater divisibility can only help the plaintiff and cannot hurt him. Section V analyzes how the credibility of the plaintiff's threat is affected by the order in which the parties' costs must be incurred. Section VI identifies necessary and sufficient conditions for credibility, both for the set of all distributions of the parties' costs and for subsets of it. Section VII concludes.

II. THE FRAMEWORK OF ANALYSIS

Assume that a party -- the plaintiff-- has a potential suit against another party -- the defendant. If the plaintiff pursues the suit all the way to judgment, he will win an expected award of J . The plaintiff's and defendant's costs of litigation if the suit is pursued all the way to judgment are, respectively, C_p and C_d . It is assumed throughout that the suit has a negative expected value: $J < C_p$.

It is assumed that C_p and C_d are not incurred all at once, but rather are spread over a number of stages. There are $n > 1$ stages between the filing of a suit and the judgment. At each stage, each party incurs a fraction of his or her total litigation costs. Let $C_p^i > 0$ and $C_d^i > 0$ denote the costs incurred in stage i by the plaintiff and the defendant respectively.

While the paper will provide a general analysis that applies for any distribution of litigation costs across stages, special attention will be given to the case in which the litigation process is finely divisible. This is the case in which n is large and, thus, the fraction of costs incurred in each stage is quite small relative to the total costs. The motivation for studying this particular case arises from the fact that it fits the most common arrangement of attorneys' fees. When a lawyer is paid according to the amount of time she spends on a case, the accumulation of litigation costs is well approximated by the fine divisibility assumption.

Prior to each of the n stages in which costs may be incurred, a round of bargaining can take place. In any given bargaining round, if that round is reached, one of the parties makes a settlement offer. The identity of the party making the offer -- whether it is the plaintiff or the defendant -- is determined randomly such that each party is equally likely to be the offeror. (This assumption implies that the parties have equal bargaining power. The analysis can easily be adjusted to the case in which the parties have unequal bargaining power.)

When a party makes an offer, the other party may either accept (i.e., a settlement is reached) or reject the offer. In the event that the offer is rejected, the plaintiff will either drop the suit or proceed to the next stage, in which case both parties incur another fraction of their litigation costs. It is assumed that the parties have no commitment mechanisms (such as ones grounded in reputation) that would enable them to bind themselves to take a particular action even if the action would not maximize their payoff. Thus, for example, the plaintiff cannot credibly bind himself to go to trial if the defendant refuses to settle, and the

defendant cannot bind herself not to settle.

It will be assumed that the expected judgment and the parties' litigation costs are common knowledge among the parties. For simplicity, it also will be assumed that the parties are both risk-neutral and have a zero discount rate.

Before proceeding with the analysis, note that without divisibility of litigation costs, the plaintiff does not have a credible threat to pursue the case all the way to judgment. If $n = 1$, there is only one bargaining round, prior to spending the litigation costs. The defendant expects the plaintiff to drop the suit if a settlement is not reached at that preliminary round and, thus, would not agree to any positive settlement amount. Note that this is true regardless of the relative magnitude of the plaintiff's and defendant's costs.

III. THE EQUILIBRIUM

The n -stage game can be solved by backward induction. Suppose that the parties reach round n . Regardless of the identity of the party making an offer in this final round, the defendant will agree to pay a positive settlement amount if and only if the plaintiff has a credible threat to proceed to the terminal stage -- judgment -- in the absence of a settlement. The plaintiff's threat to proceed to judgment will be credible if and only if:³

$$J \geq C_p^* . \tag{1}$$

This condition is likely to be satisfied if the costs are sufficiently divisible.

³ It is assumed throughout that in the event of indifference between proceeding and not proceeding, the plaintiff will proceed.

If the plaintiff's threat to proceed is credible, the defendant will agree to settle. The value of the settlement depends on who makes the offer. If the plaintiff makes the take-it-or-leave-it settlement offer, his offer, denoted by S_p^n , will equal $S_p^n = J + C_d^n$. If the defendant is the one who makes the offer, her offer, denoted by S_d^n , will equal $S_d^n = J - C_p^n$. Since each party is equally likely to be making the offer at round n , the expected value of the settlement, conditional on the parties reaching round n , will be:

$$S^n = \frac{1}{2}(S_p^n + S_d^n) = J + \frac{1}{2}(C_d^n - C_p^n) . \quad (2)$$

This settlement will be reached before the parties spend their stage- n expenditures.

Now consider bargaining rounds prior to the last round. At each such round, the plaintiff's threat to proceed to the next stage will be credible if and only if the cost he must incur in *the current stage alone* is lower than the expected settlement amount that he can expect to obtain at the next bargaining round. Thus, if any round $i < n$ is reached, the plaintiff's threat to proceed to the following stage will be credible if and only if:

$$S^{i+1} \geq C_p^i . \quad (3)$$

If the plaintiff's threat is not credible, the defendant will not agree to any positive settlement amount, and S^i will be equal to 0. If the plaintiff's threat is credible, the settlement amount depends on whether the plaintiff or the defendant makes the offer; and it will be either $S_p^i = S^{i+1} + C_d^i$ or $S_d^i = S^{i+1} - C_p^i$. The expected value of period i 's settlement is thus:

$$S^i = S^{i+1} + \frac{1}{2}(C_d^i - C_p^i) , \quad (4)$$

which, by recursive argument, yields:

$$S^i = J + \frac{1}{2} \sum_{j=i}^n (C_d^j - C_p^j) . \quad (5)$$

Expression (5) is the expected settlement at round i conditional on the plaintiff's round i threat being credible, which itself depends on the plaintiff's threat being credible in all future rounds. Expression (5) says that, in any given round, if the plaintiff can credibly threaten to proceed, the parties can be expected to settle in the mid-point of the settlement range. The settlement range for a given round reflects the expected judgment and the litigation costs that remain.

Proceeding to the first round of the bargaining by backward induction, we can obtain the following proposition:

PROPOSITION 1. *A plaintiff with an NEV suit will succeed in extracting a settlement if and only if:*

$$C_p^i < J + \frac{1}{2} \sum_{j=i}^n (C_d^j - C_p^j) \quad \forall i = 1, 2, \dots, n \quad (6)$$

Although the bargaining game is resolved instantly, it will yield a positive settlement only if the plaintiff has a credible threat to proceed in all subsequent rounds. If the plaintiff does not have a credible threat in some round j , then his credibility in every round prior to j is undermined: The defendant will anticipate that at round j the plaintiff will drop the suit and, thus, prior to round j the defendant will not be willing to settle for any positive sum. Therefore, the conditions given by Proposition 1 for an NEV suit to succeed are those ensuring that the plaintiff's threats are credible in all rounds.

If an NEV suit is settled, the settlement will take place at $i = I$, and its expected value will be:

$$S^* = J + \frac{1}{2}(C_d - C_p) .^4 \quad (7)$$

The fact that a settlement, if reached, will occur in the first round of negotiations, arises from the symmetric information assumption. With symmetric information, the outcome of the game is anticipated by both parties. The outcome cannot be a settlement at later rounds, because if the parties expected such a settlement, they would be able to structure a settlement in the first round that would make both of them better off (by saving the cost of delay and splitting this surplus between them).⁵

IV. THE EFFECT OF DIVISIBILITY ON CREDIBILITY

Proposition 1 highlights the importance of divisibility for the credibility of the plaintiff's threat. It implies that without cost divisibility, there is no credibility and the NEV suit is bound to fail; and with divisibility of cost, credibility may be gained and the NEV suit may succeed. This Section explores the importance of divisibility and presents a formal result regarding the value of divisibility.

To focus more sharply on the role of divisibility in the success of NEV suits, let us

⁴ Note that the settlement amount reflect an equal division of the settlement surplus (the saving of litigation costs). The equal division results from the assumption that the parties have equal bargaining power.

⁵ To account for the possibility of long, costly, pretrial negotiations that produce a settlement in later rounds, asymmetric information must be introduced. Parties' asymmetric information about each other's costs, the expected judgment at trial, or even the length of the game, may delay their reaching a settlement (Spier [1992]).

consider the effect of increased divisibility. To do this, let us consider the effect of making the following change in our assumptions: suppose that some stage k in the prior setting is now broken into two stages, k' and k'' (k' precedes k'' .) The litigation costs that were previously incurred in stage k , C_p^k and C_d^k are now divided between the two "sub-stages", such that $C_p^k = C_p^{k'} + C_p^{k''}$ and $C_d^k = C_d^{k'} + C_d^{k''}$. Without making any assumptions about how the costs of stage k are divided between the two sub-stages k' and k'' , it is possible to establish the following unambiguous result:

PROPOSITION 2. *An increase in divisibility may only improve the plaintiff's position: it may help to establish -- and can never undermine -- the credibility of the plaintiff's threat.*

Proof. The proof is structured as follows. First, it will be shown that if, without the increased divisibility, the plaintiff's threats at all stages are credible (that is, the conditions of Proposition 1 are satisfied), credibility remains with the increased divisibility. Second, it will be shown that if, without the increased divisibility, the plaintiff's threat is not credible (that is, the conditions of Proposition 1 are not satisfied), then the increased divisibility may lead to the plaintiff's threats being credible.

To prove these assertions, examine the conditions for credibility from Proposition 1. In the case without the subdivision of stage k there are n conditions, representing the n stages of litigation, and in the case with the subdivision of stage k there are $n + 1$ conditions, corresponding to the $n + 1$ stages. In both cases, all the conditions corresponding to stages before or after stage k are the same. The only difference between the two cases is that in place of the condition corresponding to stage k , we now have two conditions corresponding

to stages k' and k'' . Thus, to prove the first assertion (that subdivision cannot undermine credibility) we have to show that if stage- k threat is credible, so are the threats of stages k' and k'' . If stage- k threat is credible, that is, if $C_p^k \leq S^{k+1}$, it must be that $C_p^{k''} \leq S^{k+1}$ (since $C_p^{k''} \leq C_p^k$), which means that stage- k'' threat will be credible. Stage- k' threat will be credible if

$$C_p^{k'} \leq J + \frac{1}{2} \left[\sum_{j=k+1}^n (C_d^j - C_p^j) + (C_d^{k''} - C_p^{k''}) \right] . \quad (8)$$

or:

$$C_p^{k'} + \frac{1}{2} C_p^{k''} \leq J + \frac{1}{2} \left[\sum_{j=k+1}^n (C_d^j - C_p^j) + C_d^{k''} \right] . \quad (9)$$

Equation (9) must hold if stage- k threat is credible (relative to stage- k condition, in equation (9) the left hand side is smaller and the right hand side is greater, thus the inequality is reinforced.)

It remains to be shown that even if the stage- k threat is not credible, it may be the case that the threats of stages k' and k'' are credible. First, with respect to stage- k'' , since $C_p^{k''} \leq C_p^k$, it may be that $C_p^{k''} < S^{k+1} < C_p^k$, in which case the threat in stage- k'' is credible while the threat in stage- k is not. Second, with respect to stage- k' , it may be that $S^{k+1} < C_p^k < S^{k+1} + \frac{1}{2}(C_d^{k''} + C_p^{k''})$. This is a case in which stage- k threat is not credible while stage- k' threat is credible. To see that this condition guarantees that stage- k' threat is credible notice that the right inequality can be rewritten as

$$C_p^{k'} \leq J + \frac{1}{2} \left[\sum_{j=k+1}^n (C_d^j - C_p^j) + (C_d^{k''} - C_p^{k''}) \right] . \quad (10)$$

which is precisely the condition for the credibility of the threat at stage k' . Q.E.D.

We have seen, up to this point, that divisibility can establish credibility for some NEV suits, and that greater divisibility can only strengthen the plaintiff's position. These results do not imply, however, that with sufficient divisibility all NEV suits can become credible. Even with very fine divisibility, some NEV suits may not provide a credible threat and will not be able to extract a settlement. The next Section explores how the conditions for credibility are affected by the form of the distribution of costs over time.

V. THE EFFECT OF THE ORDER OF THE PARTIES' COSTS

The analysis thus far did not make any assumptions regarding the way in which the litigation costs are distributed across the n stages. This Section explores this issue. Specifically, it examines whether the plaintiff benefits from having most of his costs come before, after, or at the same time as the defendant's costs.

At first glance, one may conjecture that the plaintiff's strategic position will be better if the weight of his costs will be concentrated at the late stages of the litigation process. But, as the analysis below demonstrates, the converse is true.

To explore this issue, let us consider the effect of changes in the distribution of the defendant's litigation costs over time. Consider the effect of a shift in expenditures of the defendant from an earlier stage to a later stage. More concretely, suppose that some of the defendant's stage- k cost, denoted by Δ , is shifted to stage $l > k$. Everything else remains

unchanged. Without making any further assumptions, we can establish the following unambiguous result:

PROPOSITION 3. *A shift in the litigation costs of the defendant from earlier to later stages will never make the plaintiff worse-off: it may help to establish -- and can never undermine -- the credibility of the plaintiff's threat. Correspondingly, any shift in the litigation costs of the defendant from later to earlier stages will never make the plaintiff better-off.*

Proof. Let us look at the conditions for credibility from expression (6). The shift of Δ from stage k to stage l will have no effect on whether the conditions are satisfied with respect to $i > l$ or $i \leq k$. And the shift will make the condition more likely to be satisfied for stage l or any other stage between $k+1$ and l . Thus, it may be the case that the threat in some stage between $k+1$ and l was not credible prior to the shift but is credible after the shift. Q.E.D.

Proposition 3 demonstrates that in the universe of NEV suits, the plaintiff's strategic position is strengthened by any move of the defendant's expenses to later stages. This feature has interesting implications for the institutional arrangements that govern the litigation process. For one, the rules of legal procedure which organize the order in which parties present evidence in courts may affect the parties' strategic positions. Under the existing legal procedure in the U.S., a plaintiff presents evidence to the court before the defendant. By shifting the defendant's costs of presenting evidence to later stages, the strategic position

of the plaintiff may be improved.⁶

VI. IDENTIFYING NECESSARY AND SUFFICIENT CONDITIONS FOR CREDIBILITY

In this Section it will be assumed that the plaintiff's litigation costs are finely divided. That is, it is assumed that n is very large and that each C_p^i is a very small fraction of C_p . The analysis below explores the conditions for credibility, given this fine division. We have already seen how credibility is affected by relative shifts of the parties' costs over time. We now examine how credibility is affected by the different forms that the parties distributions may take. In doing so, we establish necessary and sufficient conditions for the credibility of the plaintiff's threat. We begin by examining the benchmark case, in which the parties' costs are expected to be spent at the same pace over time, and then proceed to examine more general cases.

A. The Case of Identical Distributions Over Time

This is the case in which $C_p^i/C_p = C_d^i/C_d$ for all i , that is, the parties incur their costs at the same pace. When the plaintiff's costs are very finely divided, the n conditions for credibility that were established in Proposition 1, corresponding to the n stages, can be simplified. Consequently, the following result can be established:

PROPOSITION 4. *With fine division of costs, the conditions for the plaintiff's threat being credible can be approximated by the following necessary and sufficient condition:*

⁶ Previous economic analysis has focused on other effects of the order of evidence presentation, in particular the effect of coordination. See Hay and Spier (1996).

$$J + \frac{1}{2}(C_d - C_p) > 0. \quad (11)$$

Proof. First, suppose that condition (11) is satisfied, and let us demonstrate that the threats in all stages will be credible. For very large n , condition (11) approximates the condition for credibility in stage 1, so the credibility in this stage is satisfied. In any round $i > 1$, credibility arises if, by approximation, $S^{i+1} > 0$. Expression (11) and the assumption that the parties incur the costs at the same pace guarantee that $S^{i+1} > 0$.

Next, suppose that condition (11) does not hold, and let us demonstrate that not all threats will be credible. In particular, since condition (11) approximates the condition for credibility at $i = 1$, there is no credibility at the initial stage and the NEV suit will not be credible. Q.E.D.

One of the implications of Proposition 4 is that, if $C_d > C_p$, the plaintiff has a credible threat, no matter how small J is, or how high his costs, C_p , are. Since the defendant has "more to lose" from litigation than the plaintiff, the plaintiff can extract a settlement.

B. A Necessary Condition for All Distributions

We have seen that $J + \frac{1}{2}(C_d - C_p) > 0$ is a necessary condition for the plaintiff's credibility in the case of identical distributions over time. The question addressed here is whether there are some distributions of costs over time for which this condition is not necessary. Can the plaintiff have credibility without satisfying the above condition? As the following result states, the answer is no.

PROPOSITION 5. *For any distribution of the parties costs over time, and no matter how finely divisible the plaintiff's litigation costs, a necessary condition for the plaintiff's threat to be credible is:*

$$J + \frac{1}{2}(C_d - C_p) > 0. \quad (11)$$

Proof. If (11) is not satisfied, then the condition for the credibility of threat at $i = 1$ (from expression (6)) is not satisfied. Q.E.D.

To illustrate the necessity of condition (11), consider the following polar case. Suppose that almost all of the defendant's costs in all rounds $i < n$ were shifted to round n . We know from Proposition 3 that this is the best distribution of defendant's costs from the plaintiff's point of view, as he now bears almost all of his costs before the defendant. Even in this case, $J + \frac{1}{2}(C_d - C_p) > 0$ is still necessary for the plaintiff to have a credible threat at stage 1.

C. A Sufficient Condition for a Subset of the Universe of Distributions

We have established above that $J + \frac{1}{2}(C_d - C_p) > 0$ is a necessary condition for credibility in the entire universe of cases. It can be shown that, with fine divisibility, it is also sufficient for a very large set of cases.

Consider the set of cases in which the plaintiff's pace of expenditures is expected to be as fast or faster than that of the defendant. To be precise, the plaintiff's pace of expenditures is at least as fast as the defendant's if and only if:

$$\frac{\sum_{j=i+1}^n C_p^j}{C_p} \leq \frac{\sum_{j=i+1}^n C_d^j}{C_d} \quad \forall i = 1, \dots, n \quad (12)$$

That is, the plaintiff is expected, by the end of each litigation stage, to have incurred at least as large a fraction of his total litigation costs as the defendant has done (i.e., the defendant has a larger fraction remaining). In this case, we can establish:

PROPOSITION 6. *With fine divisibility of the plaintiff's litigation costs, if the pace of the plaintiff's expenditures over time is at least as fast as that of the defendant, a sufficient condition for the credibility of the plaintiff's threat is*

$$J + \frac{1}{2}(C_d - C_p) > 0. \quad (11)$$

Proof. For fine divisibility of costs, condition (11) approximates the condition for credibility in stage 1, so the credibility in this stage is satisfied. In any round $i > 1$, credibility arises if, by approximation, $S^{i+1} \geq 0$. To see that $S^i \geq 0 \forall i$, consider first the case in which $C_d - C_p > 0$.

In this case, expression (12) implies that

$$\sum_{j=i+1}^n (C_d^j - C_p^j) > 0.$$

so that $S^i > 0 \forall i$. Next, consider the case in which $C_d - C_p \leq 0$. In this case, expression (12) implies that

$$\sum_{j=i+1}^n (C_d^j - C_p^j) \geq C_d - C_p .$$

which implies that $S' \geq J + \frac{1}{2}(C_d - C_p)$, in which case expression (11) guarantees that $S' \geq 0$. Q.E.D.⁷

D. A Sufficient Condition for the Universe of All Distributions

Finally, let us state a condition that, with fine divisibility, is sufficient to establish credibility no matter what form is taken by the parties' distributions of costs over time.

PROPOSITION 7. *With fine divisibility of the plaintiff's litigation costs, a sufficient condition for the credibility of the plaintiff's threat is*

$$J - \frac{1}{2}C_p > 0. \tag{13}$$

Proof. Condition (13) guarantees that the right hand side of expression (6), which is the condition for credibility in all stages, will be positive, no matter how large C_d is, or how it is divided over time. With fine divisibility, this implies that the conditions for credibility in expression (6) are satisfied. Q.E.D.

⁷ An alternative way of proving Proposition 6 is as follows. Proposition 4 established that condition (11) is sufficient for the case of identical distributions of costs over time. Any case in which the plaintiff is expected to incur costs a faster pace than the defendant can be viewed as a case in which the pace was identical and then some of the plaintiff's costs were shifted to earlier stages and some of the defendant's costs were shifted to later stages. By Propositions 3 and 4 we know that such moves can only improve the plaintiff's position. Thus, if expression (11) is sufficient before the shift, then it must also be sufficient after the shift.

VII. CONCLUSION

Even when the litigation costs of a potential plaintiff are known to exceed his expected judgment, a threat to sue can be credible and can succeed in extracting a settlement offer from the defendant. This paper has analyzed how the credibility of such threats is shaped by the way in which the parties' litigation costs are expected to be distributed over time. The analysis has demonstrated that greater divisibility of litigation costs may help -- and can never hurt -- the plaintiff's strategic position. The analysis has also identified the strategic implications of the order in which the parties must incur the bulk of their litigation costs; it was shown that, contrary to what might be initially thought, the plaintiff will be better off if the defendant's costs must be largely incurred *after* the plaintiff's cost are incurred. Finally, for the various possible distributions of the parties' costs over time, the analysis has identified necessary and sufficient conditions for the plaintiff's threat to be credible (and thus to succeed in extracting a settlement).

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