

# The University of Chicago The University of Chicago Law School

The Incentive to Sue: An Option-Pricing Approach Author(s): Bradford Cornell Reviewed work(s): Source: The Journal of Legal Studies, Vol. 19, No. 1 (Jan., 1990), pp. 173-187 Published by: The University of Chicago Press for The University of Chicago Law School Stable URL: <u>http://www.jstor.org/stable/724416</u> Accessed: 13/12/2012 12:49

Your use of the JSTOR archive indicates your acceptance of the Terms & Conditions of Use, available at http://www.jstor.org/page/info/about/policies/terms.jsp

JSTOR is a not-for-profit service that helps scholars, researchers, and students discover, use, and build upon a wide range of content in a trusted digital archive. We use information technology and tools to increase productivity and facilitate new forms of scholarship. For more information about JSTOR, please contact support@jstor.org.



*The University of Chicago Press, The University of Chicago, The University of Chicago Law School* are collaborating with JSTOR to digitize, preserve and extend access to *The Journal of Legal Studies*.

http://www.jstor.org

## THE INCENTIVE TO SUE: AN OPTION-PRICING APPROACH

**BRADFORD CORNELL\*** 

#### I. INTRODUCTION

FOLLOWING the path-breaking work of Landes, it has become common to view a legal claim as an investment opportunity that litigants pursue with reference to expected costs and benefits.<sup>1</sup> The early articles that developed this approach, including Gould, Posner, and Shavell, are based on a simple model of the "litigation investment."<sup>2</sup> In deciding whether to sue or whether to settle, the litigants consider the costs and benefits under the assumption that they must either settle promptly or go to trial. There are no intermediate decisions to be made along the way. Under these conditions, the discounted cash flow model can be used to analyze litigation investments.

The discounted cash flow model has strong implications regarding the management of lawsuits. First, it implies that a suit will be filed only if the expected value of going to trial is positive. Second, as Shavell proves, the suit will be settled prior to trial unless the plaintiff's estimate of the expected judgment exceeds the defendant's estimate by at least the sum of their legal costs.<sup>3</sup>

More recently, Bebchuk, P'ng, and Reinganum and Wilde, among others, have attempted to generalize the discounted cash flow approach by

\* Professor of Finance and Director of Security Pacific Research Center, Anderson Graduate School of Management, University of California, Los Angeles. I would like to thank Michael Brennan, David Hirshliefer, Ivan P'ng, and Richard Roll for helpful comments on previous drafts. The errors and omissions that remain are my own.

<sup>1</sup> William M. Landes, An Economic Analysis of the Courts, 14 J. Law & Econ. 61 (1971).

<sup>2</sup> John P. Gould, The Economics of Legal Conflicts, 2 J. Legal Stud. 279 (1973); Richard A. Posner, An Economic Approach to Legal Procedure and Judicial Administration, 2 J. Legal Stud., 399 (1973); Steven Shavell, Suit Settlement and Trial: A Theoretical Analysis under Alternative Methods for the Allocation of Legal Costs, 11 J. Legal Stud. 55 (1982).

<sup>3</sup> Shavell, supra note 2.

[Journal of Legal Studies, vol. XIX (January 1990)] © 1990 by The University of Chicago. All rights reserved. 0047-2530/90/1901-0003\$01.50 developing game-theoretic models which take account of the sequential nature of litigation investments and also allow for the introduction of asymmetric information and strategic behavior.<sup>4</sup> Unfortunately, these models quickly become complicated, even with strict constraints placed on the decision-making processes litigants are assumed to employ. Furthermore, the conclusions are sensitive to the assumed distribution of information and to the assumed rules for strategic negotiation.

This article presents a third approach for analyzing litigation investments that accounts for the sequential nature of decision making without introducing asymmetric information. Finance theory recognizes that most investments involve a series of options.<sup>5</sup> Consider, for instance, the construction of an oil refinery. The decision to commence construction gives the firm a variety of options. Depending on future developments, such as changes in the price of oil, both the rate of construction and the scope of the project can be altered. Under severe duress, management even has the option to terminate the project. These options make the undertaking more valuable than it would be if management had to choose at the outset between forgoing the project or building the refinery according to a predetermined plan.

The same is true of a lawsuit. Filing a suit is analogous to purchasing an option, because it gives the plaintiff the right to proceed toward trial without having the obligation to try the case. Once the suit is under way, the plaintiff has a variety of options. For example, he can choose whether to proceed quickly, whether to make motions such as asking for a change of venue, whether to devote extensive resources to discovery, and whether to make a settlement offer. These options make a lawsuit a more valuable investment than it would be if the plaintiff had to choose initially between trying the case and not filing a suit. As a result of these options, plaintiffs have an incentive to file suits whose net present value is negative according to the discounted cash flow model. In addition, a plaintiff will not settle prior to trial unless the settlement offer exceeds the sum of the expected receipts from trial and the current "option value" of the case.

<sup>4</sup> Lucian Arye Bebchuk, Litigation and Settlement under Imperfect Information, 15 Rand J. Econ. 404 (1984); I. P. L. P'ng, Strategic Behavior in Suit, Settlement and Trial, 14 Bell J. Econ. 539 (1983); I. P. L.. P'ng, Litigation, Liability, and the Incentives for Care, 34 J. Public Econ. 61 (1987); Jennifer F. Reinganum & Louis L. Wilde, Settlement, Litigation, and the Allocation of Litigation Costs, 17 Rand J. Econ. 557 (1986).

<sup>5</sup> Contributions to this literature include Richard A. Brealey & Stewart C. Myers. Principles of Corporate Finance (3d ed. 1988); Michael J. Brennan & Eduardo S. Schwartz, Evaluating Natural Resource Investments, 58 J. Bus. 135 (1985); Scott Mason & Robert C. Merton, The Role of Contingent Claims in Corporate Finance, in Recent Advances in Corporate Finance (E. Altman & M. Subrahmanyam eds. 1985); Levos Trigeorgis & Scott P. Mason, Valuing Managerial Flexibility, 5 Midland Corp. Fin. J. 14 (1987). **INCENTIVE TO SUE** 

It is important to recognize that the "price" of these litigation options is not negotiated between buyer (the plaintiff) and seller (the defendant). When a lawsuit is filed, the defendant is forced to write litigation options at prices that depend on the plaintiff's cost of pursuing the suit. The value of the options, as will be made clear later, depends on an interaction between the specfic characteristics of the case and the rules for civil procedure. It is possible, therefore, that a defendant will be forced to write options whose value significantly exceeds the plaintiff's purchase price.

To develop the implications of option-pricing theory for litigation, this article is organized into several parts. The next section briefly reviews the option-pricing model and discusses conditions under which it can be applied to litigation. The third section presents a detailed series of examples designed to illustrate how litigation options affect the incentive to sue and the incentive to settle. Building on these examples, the fourth section uses the option-pricing approach to explore the relation between legal procedure, legal practice, and the incentive to sue. The final section summarizes the conclusions.

#### II. THE OPTION-PRICING FRAMEWORK: A BRIEF REVIEW

Option contracts convey rights, but not obligations, to their holders. Options terminology is most easily defined with reference to the wellknown example of stock options. A *call* option on IBM stock gives its holder the right to buy a specified number of IBM shares at a specified price (the exercise price) up to some specified date (the expiration date). A put option is just the reverse; it gives its holder the right to sell a specified number of shares at a specified price up to a specified date. In both cases, the party that sells the option is called the option writer. The price the purchaser pays for the option is referred to as the option premium or option price. As a specific example, one party may write—and sell for \$10-a call option that gives the purchaser the right to buy 100 shares of IBM stock at a price of \$120 anytime in the next six months. After six months, if the price of IBM's stock price exceeds \$120, the buyer will choose to exercise the option and purchase the stock at \$120.6 If the price of IBM is less than \$120, the buyer will allow the option to expire worthless.

The options that arise in litigation differ in two fundamental ways from the options analyzed by Merton, and Black and Scholes, in their seminal

<sup>&</sup>lt;sup>6</sup> In the case of traded options, the buyer may choose to sell the option rather than exercise it.

articles.<sup>7</sup> First, the underlying random variable on which the option value depends is assumed to be unaffected by the actions of option traders. In the case of IBM stock options, for example, the underlying random variable is the price of IBM stock. Option-pricing models assume that the probability distribution for IBM stock is not affected by option trading. In a legal setting, the random variable that determines the value of the litigation options is the award at trial. Clearly, this random variable is affected by actions of the litigants, such as the amount they decide to spend on attorney's fees.

Second, to calculate the value of an option, there must be a marketable security whose probability distribution equals the probability distribution of the underlying random variable. The security is necessary in order to establish the hedge position that is used to price the option. For stock options, the underlying stock is by definition the appropriate hedging security. In the case of litigation options, there are no traded securities whose payouts have the same probability distribution as the potential award at trial. For this reason, standard option-pricing models cannot be used to value litigation options.<sup>8</sup>

Both of these problems can be overcome to a large extent by assuming that litigants are risk neutral. Though this assumption reduces the generality of the conclusions, it has been commonly employed in the literature.<sup>9</sup> The goal of this article, furthermore, is not to provide precise estimates of the value of litigation options, but to offer general insights into how such options affect the incentive to sue. In this more limited context, the assumption of risk neutrality is less restrictive.

#### III. THE EFFECT OF LITIGATION OPTIONS: SOME EXAMPLES

The effect of litigation options on the incentive to sue is best elucidated by a series of examples. Figure 1 illustrates the application of the discounted cash flow approach to a hypothetical case. The case involves three stages, the first of which is discovery. Following discovery, there is a period of pretrial maneuvering. The final phase is the trial.

The decision tree in Figure 1 is read from right to left. The right-hand

<sup>&</sup>lt;sup>7</sup> Robert C. Merton, Theory of Rational Option Pricing, 4 Bell J. Econ. 141 (1973); Fischer Black & Myron Scholes, The Pricing of Options and Corporate Liabilities, 81 J. Pol. Econ. 637 (1973).

<sup>&</sup>lt;sup>8</sup> In situations where the value of litigation options cannot be calculated, the effect of the options on the incentive to sue can be studied using the fundamental properties developed by Merton, *supra* note 7, and others.

<sup>&</sup>lt;sup>9</sup> Landes, *supra* note 1; Posner, *supra* note 2; and P'ng, *supra* note 4, all assume that litigants are risk neutral. Shavell, *supra* note 3, makes the same assumption throughout most of his article.

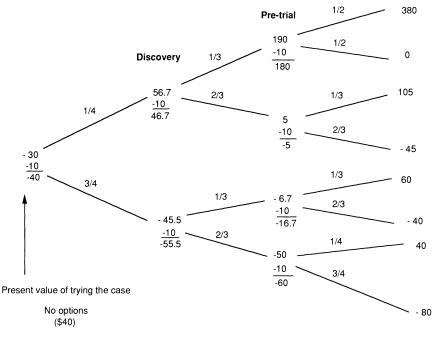


FIGURE 1.- The discounted cash flow approach

side shows the award the plaintiff receives at trial if the sequence of events that leads to that outcome occurs. For example, if the plaintiff wins at all three stages, the award at trial is \$380, but if the plaintiff loses at all three stages, the defendant is awarded \$80 at trial. Though the numbers are arbitrary, they are selected to reflect the fact that the award depends on the discovery and the pretrial maneuvering as well as the outcome of the trial.

The probabilities of each of the outcomes are shown in the figure. The probabilities indicate that this is a weak case in the sense that the plaintiff is likely to lose most of the decisions. The probabilities also reflect the fact that the likelihood of winning at future stages depends on what has happened in the past. For instance, if discovery and pretrial maneuvering favor the plaintiff, he has a  $\frac{1}{2}$  probability of prevailing at trial. If discovery and pretrial maneuvering are not promising, the plaintiff's chance of winning is only  $\frac{1}{4}$ . The probability of each of the eight final outcomes is calculated by multiplying the probabilities at each stage along the path leading to that outcome. For example, the probability that the plaintiff will win a \$380 judgment is  $\frac{1}{24}$  (=  $\frac{1}{4} \cdot \frac{1}{3} \cdot \frac{1}{2}$ ).

To reflect the cost of litigation, it is assumed that the plaintiff must pay \$10 in advance to progress from one stage to the next. Fixing the expenses in advance does not reduce the generality of argument because the random element of the expenses can be included as part of the court award. Finally, time discounting is ignored to simplify the calculations. Under risk neutrality, time discounting amounts simply to dividing by one plus the risk-free rate raised to the appropriate power.

According to the discounted cash flow model, the value of a lawsuit equals the expected value of the payment at trial minus the cost of litigation. In terms of Figure 1, this expected value can be calculated in two ways. The first approach is to multiply the probability of each of the eight final outcomes by the dollar award if that outcome occurs, yielding an expected award of (\$10), and then to subtract the \$30 in legal costs to arrive at a total expected value of (\$40) (amounts in parentheses are negative). The second approach is to work backward from right to left, calculating the expected value at each step. Consider, for example, the two trial outcomes of \$380 and \$0, which are possible after the plaintiff has prevailed in the first two stages. Because each of these outcomes has a probability of 1/2, the expected value of going to trial is \$190 minus the \$10 cost of trying the case. Thus 190 - 10 = 180 is entered at that point on the decision tree. Similarly, the expected value of going to trial after the defendant has prevailed at the first two stages is (\$60) (=  $\frac{1}{4} \cdot 40$  $-\frac{3}{4} \cdot 80 - 10$ ). Proceeding in this fashion, all the nodes on the decision tree can be calculated as shown in Figure 1. The expected value of the lawsuit at the time it is filed is given by the number at the root of the tree, (\$40).

The negative expected value in Figure 1 is not surprising in light of the fact that the example was constructed to illustrate a weak case. Because the expected value is negative, the discounted cash flow model predicts that such a suit would never be filed. This conclusion, however, is based on the assumption that all suits that are filed must be tried. It ignores the value to the plaintiff of the option to terminate litigation if things look bleak.

Figure 2 presents a decision tree that reflects the plaintiff's litigation options. To evaluate the value of filing a suit, it is necessary to work backward from left to right, taking account of the defendant's options at each decision node. When a node is reached at which the value is negative, it is assumed that the plaintiff would drop the case, so the value is switched to zero. For example, in Figure 1 the second node down under the heading "pretrial" has a value of 5 - 10 = (5). A rational plaintiff who reached this point in the decision tree would choose to drop the case rather than pay \$10 to continue the litigation. Therefore, the value at this

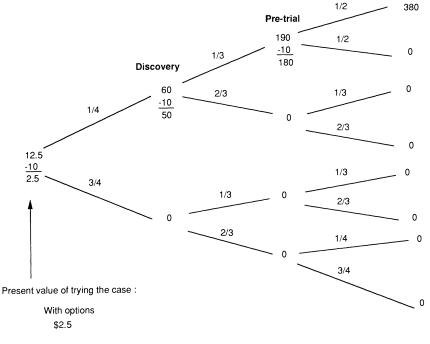


FIGURE 2.—The option-pricing approach

node, and all values to the right of it, should be replaced by zero.<sup>10</sup> Proceeding in this fashion, Figure 1 is transformed into Figure 2 by including the plaintiff's options.

Taking account of the litigation options raises the value of bringing suit from (\$40) to \$2.50. The increase in value is due to the asymmetrical payoff on the options. Under fortuitous conditions, when the payoff is large, the plaintiff exercises his option to continue the case by paying the \$10 fee; under unfavorable conditions, the plaintiff limits his loss by dropping the case (letting the option expire worthless).<sup>11</sup>

The asymmetrical payoff also implies that the value of litigation options rises as the uncertainty regarding the final payoff increases.<sup>12</sup> To illustrate this point, the final payouts in Figure 1 are altered by reducing the maximum award from \$380 to \$200 and reducing the maximum loss from \$80

<sup>&</sup>lt;sup>10</sup> This assumes that there is no cost to dropping a case.

<sup>&</sup>lt;sup>11</sup> This assumes that the plaintiff pays all of his legal fees. If a contingent fee arrangement is used, the plaintiff and his counsel should be thought of as one party.

<sup>&</sup>lt;sup>12</sup> See John C. Cox & Mark Rubinstein, Option Markets (1985), for a general proof.

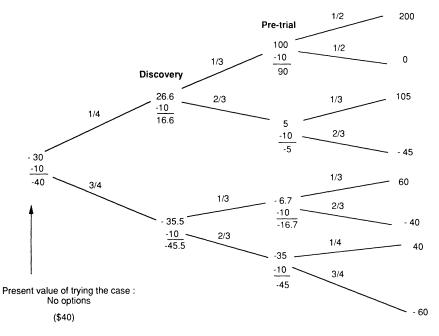


FIGURE 3.—The discounted cash flow approach—the low variance case

to \$60. Because the probability of losing is higher than the probability of winning, these reductions leave the discounted cash flow present value of the suit unchanged, as shown in Figure 3. However, Figure 4 shows that the value of the suit, including litigation options, falls from \$2.50 to (\$5). From the standpoint of option pricing, reducing the maximum loss is irrelevant because the plaintiff will drop the case following unfavorable discovery. Reducing the maximum gain has a sharp effect on the value of a lawsuit because the plaintiff will proceed with the suit when the likelihood of receiving the maximum award is high.

In determining whether to settle a case, rational plaintiffs will never accept less than the full value of a lawsuit, including any litigation options. Accordingly, the suit shown in Figures 1 and 2 could not be settled for less than \$2.50. On these grounds, it is tempting to conclude that the case will never settle because the defendant will conclude that the expected value of going to trial is positive (negative for the plaintiff) and refuse to settle. The flaw in this argument is that a rational defendant will realize that most cases never get to trial. Only in those situations in which the plaintiff exercises all his options will the case be tried. But it is in those situations where the defendant's loss is largest. Because the defen-

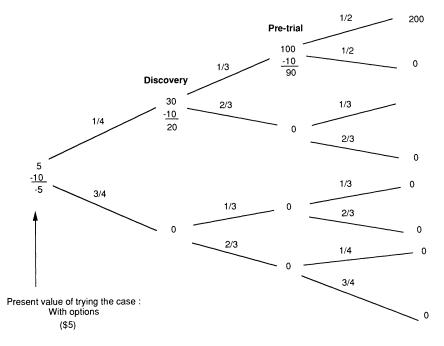


FIGURE 4.—The option-pricing approach—the low variance case

dant is forced to write the plaintiff's options when a suit is brought, any benefits the options convey on the plaintiff must be offset by costs they impose on the defendant. Thus, if the litigants share the same probability assessments, they will agree on the value of the case. It follows that the defendant will still choose to settle immediately in order to avoid the cost of litigation, as in Shavell, despite the fact that he has to pay for the litigation options.<sup>13</sup>

Though the implications for settlement of the option-pricing approach and the discounted cash flow approach are the same in a simplified theoretical environment, in practical situations they are likely to vary for a number of reasons. First, the assumption that litigants have identical beliefs is more critical in the case of suits that become economically viable because of their option component. Due to the asymmetrical payoffs on options, small differences of opinion regarding the probability of outcomes in which the plaintiff receives a big award can lead to large percentage changes in the perceived value of a suit. For example, suppose

<sup>13</sup> Shavell, supra note 2.

that the probability of the plaintiff winning the trial after favorable discovery and favorable pretrial maneuvering is reduced from  $\frac{1}{2}$  to  $\frac{2}{5}$ . In that case, the probability of the plaintiff receiving the \$380 award drops from .042 to .033, and the present value of the lawsuit using the discounted cash flow method falls 7.8 percent, from (\$40) to (\$43.10). The value of the lawsuit, using the option-pricing approach, also falls \$3.10, but that drop represents 124 percent of the original value of the suit.

Second, settling a case based on its option value raises several strategic issues in a world of imperfect information. While these issues cannot be rigorously analyzed without a game-theoretic model, they are provocative nonetheless. For instance, other potential plaintiffs observing a defendant settling an apparently strong case on unfavorable terms may conclude that the defendant is an easy target and not that the option value of the case is high. Similarly, if the case is settled on such terms, it will be difficult to explain to stockholders or other interested parties what the litigation options were and why the defending firm paid so much for them.

These strategic problems can be avoided by paying the legal fees necessary to proceed farther down the decision tree. At the last step on the tree, the suit has no option value because the plaintiff has no further choices. Thus, the passage of time is likely to increase the probability of settlement for two reasons. First, as information about the suit is collected by both parties, probability assessments should converge. Second, as the option value of the case falls, the strategic problems associated with "paying for litigation options" are reduced.

### IV. IMPLICATIONS OF THE OPTION-PRICING APPROACH

The option-pricing approach highlights the fact that whenever a suit is filed, the defendant is forced to write litigation options that give the plaintiff the right to pursue the case in promising situations and the right to drop the case in unfavorable conditions. If the social value of a case is equated with the expected outcome of the trial, then the option-pricing approach implies that too many suits will be filed and that resources will be unfairly transferred from defendants to plaintiffs.<sup>14</sup> Even without drawing this strong conclusion, however, the option-pricing model can be used to determine those factors that will cause the value of litigation options to rise, thereby increasing the incentive to file suits and increasing the transfer of resources from defendants to plaintiffs.

Because the value of an option grows when the variance of the underlying random variable rises, increasing uncertainty regarding court awards will make filing a lawsuit a more attractive investment. For this reason,

<sup>14</sup> Whether or not the social value of a case equals its expected outcome is a question that cannot be answered without a social utility function.

the granting of a few huge awards can greatly increase the incentive to sue by making litigation options more valuable. Suits will be filed even when the probability of winning such an award is so small that the discounted cash flow expected value is negative because the plaintiff has the option to drop the case at the optimal moment.

This implication of the option pricing model provides an interesting interpretation of some of the data presented in the Report of the Tort Policy Working Group.<sup>15</sup> The report notes that "[a] very small percentage of all tort cases account for a very large percentage of all awarded tort damages. Thus, it appears that much of the explosion in jury awards that has manifested itself so dramatically in recent years can be attributed in large part to a small percentage of all cases."<sup>16</sup> In an option-pricing context, such a skewed distribution of awards leads to much greater option values and produces a correspondingly larger incentive to sue than if everyone received approximately the average award. In the case of tort law, the incentive to sue is further increased by what the Working Group *Report* refers to as the "uncertainty as to what the rules of tort liability applicable to any particular company, person or activity will be in future years."<sup>17</sup> Such uncertainty makes litigation options more valuable. It is not surprising, therefore, that the report finds that "[p]roduct liability actions filed in Federal Court from 1974 to 1985 had increased by 758% and that federal district court medical malpractice actions had increased almost three fold in the past decade."<sup>18</sup>

Uncertainty is also a function of time. For example, the variance of stock returns rises monotonically as the observation interval is increased. With respect to litigation, the longer the interval between the time a suit is filed and the time a decision is reached, the greater the probability that events will occur that affect the final award. For instance, new facts may come to light or legal precedents may change. It follows that crowding of the courts or changes in legal procedure that delay litigation will add to the number of suits filed. The crowding effect also suggests a feedback between suits filed and the value of litigation options. As the number of suits filed increases, the courts become more crowded, the litigation process slows, the value of litigation options rises, and the incentive to sue grows.<sup>19</sup>

<sup>15</sup> Report of the Tort Working Group (Washington, D.C., 1986).

<sup>16</sup> An Update on the Liability Crisis: Tort Policy Working Group (Washington, D.C., 1987).

<sup>17</sup> Report of the Tort Policy Working Group, *supra* note 15, at 51.

<sup>18</sup> Id., at 46, 48.

<sup>19</sup> There is a possible offsetting effect. To the extent that a slowdown in the legal process leads to greater fixed costs for the plaintiffs, and thereby higher prices for litigation options, the incentive to sue will fall.

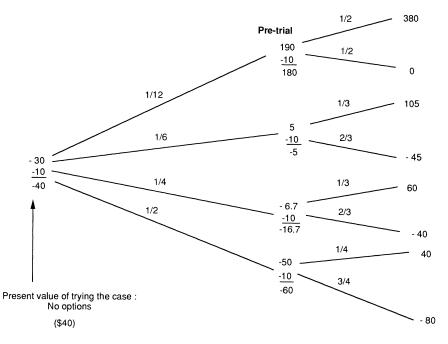


FIGURE 5.—The discounted cash flow approach—fewer options

Legal procedure also can affect the value of litigation options directly. Litigation options derive their value from the choices they give the plaintiff. The more such choices a plaintiff has, the greater the total value of his litigation options. To illustrate this point, Figures 5 and 6 reproduce the decision trees shown in Figures 1 and 2, assuming that the discovery and pretrial phases of the litigation are telescoped into one step. After filing the suit, the plaintiff must pay \$20 to proceed through the combined discovery and pretrial step. As shown in Figure 5, the combined step has four possible outcomes, depending on whether or not discovery and pretrial maneuvering are favorable to the plaintiff.<sup>20</sup>

Figure 5 demonstrates that combining the steps has no effect on the discounted cash flow value of the lawsuit. Using the option-pricing approach, however, the value of the lawsuit falls from \$2.50 to (\$5). Intuitively, the drop in value occurs because the plaintiff must decide at the outset whether to invest \$20 to proceed through the pretrial phase without knowing the results of discovery. Thus, he loses the flexibility of paying

 $<sup>^{20}</sup>$  The number of outcomes is not changed by telescoping the two steps; the difference is that the plaintiff can no longer make a choice based on the outcome of discovery.

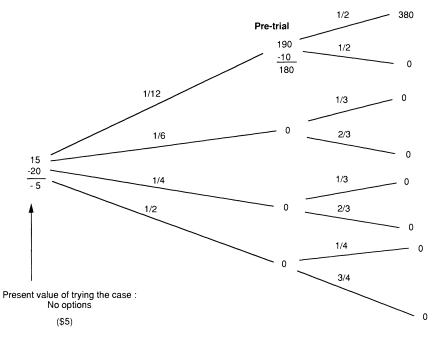


FIGURE 6.—The option-pricing approach—fewer options

\$10 to proceed with discovery and then paying an additional \$10 only if discovery is favorable. This reduction in flexibility makes the suit less valuable. Thus, both the discounted cash flow approach and the optionpricing approach imply that an increase in the cost of litigation will reduce the incentive to sue, but the option-pricing approach also implies that the value of a case depends on the extent to which the fees are contingent upon the plaintiff's decision to proceed with litigation.

One intriguing explanation of the rising tide of litigation, which has not been limited to tort law, is that institutional changes have greatly increased the value of litigation options. Katz reports that civil filings in federal district courts rose by 77 percent from 1970 to 1979 and by 161 percent from 1960 to 1979.<sup>21</sup> The number of federal appeals filed has risen from 3,899 in 1960, to 10,248 in 1969, to 20,219 in 1979. The option-pricing approach suggests that the jump reported by Katz can be attributed to heightened uncertainty regarding awards, rapidly changing legal stan-

<sup>&</sup>lt;sup>21</sup> Avery Katz, Measuring the Demand for Litigation: Is the English Rule Really Cheaper?
3 J. L., Econ. & Org. 143 (1987).

dards, added delays in litigation, and more complex legal and flexible procedures, all of which serve to increase the value of litigation options.

A countervailing force is that when a plaintiff brings suit, he is vulnerable to counterclaims by the defendant. However, this offsetting force is not likely to be strong. The option-pricing approach does not imply that plaintiffs have an incentive to file frivolous or malicious suits that are open to counterclaim. It is the *possibility*, but not the certainty, that the suit has merit that makes the option value of a case large. To illustrate, suppose that a company restates its accounting statements, turning a previously reported profit into a large loss. Assume, furthermore, that there is some suspicion that key executives knew of the loss beforehand. Under these circumstances, a class-action suit can be brought that has a large option value. If malfeasance is discovered, the payoff will be large. If no evidence of wrongdoing is uncovered, the case can be dropped. Though the uncertainty increases the value of the litigation options, it does not mean that the suit is unjustified. As long as the original suspicion has some justification, defendant counterclaims against the plaintiff should not carry much weight.

Finally, the option-pricing approach has interesting implications for the debate regarding the implementation of the English rule. In a series of articles, Katz, Bowles, Plot, and P'ng extend the work of Shavell on the effect of the English rule versus the American rule on the incentive to sue and the incentive to settle.<sup>22</sup> In contrast to the American rule, which calls for both parties to pay their own legal fees, the English rule requires the losing party to pay all legal fees. From an option-pricing perspective, the key question is not who pays after a decision is reached, but who pays the fees if the case is dropped. Assuming that both parties pay their own fees unless the case goes to trial, and maintaining the assumption of identical beliefs, the option-pricing model predicts that implementation of an English rule would increase the incentive to sue. The reason for this is that the English rule increases the variance of the final award. The maximum award grows because the plaintiff receives compensation for his legal fees, while the maximum loss grows because the plaintiff must pay the defendant's legal fees. Because of the asymmetrical payoff on options, this increase in variance makes the suit more valuable to the plaintiff.

<sup>&</sup>lt;sup>22</sup> Katz, *supra* note 21; Roger Bowles, Settlement Range and Cost Allocation Rules: A Comment on Avery Katz's Measuring the Demand for Litigation: "Is the English Rule Really Cheaper?" 3 J. L., Econ. & Org. 177 (1987); Charles R. Plott, Legal Fees: A Comparison of the American and English Rules, 3 J. L., Econ. & Org. 185 (1987); P'ng, *supra* note 4; Shavell *supra* note 2.

#### **INCENTIVE TO SUE**

#### V. SUMMARY AND CONCLUSIONS

The option-pricing approach to litigation presented here lies between the early discounted cash flow analysis and the recently developed gametheory models. The virtue of the option-pricing model is that it takes account of the sequential nature of decisions in litigation without introducing strategic interaction and its attendant complications. Furthermore, the model produces several intuitive and provocative predictions regarding the relation between legal procedure, legal practice, and the incentive to sue.

Like the early discounted cash flow approach, the option-pricing approach predicts that an increase in the cost of litigation reduces the incentive to sue. In the option-pricing framework, however, it is also important when fees must be paid. To the extent that the plaintiff can "pay as he goes," the option value of the case is maximized because the plaintiff can avoid future expenses by dropping the case.

The option-pricing model, like many of the game-theoretic models, implies that the value of filing a suit depends on the variability of the possible awards, as well as their expected value. The greater the uncertainty about the final award, the larger the option value of filing a lawsuit. For this reason, a few massive jury awards can have a significant effect on the incentive to sue. Similarly, rapidly changing legal precedents can increase the incentive to sue by adding to uncertainty.

The option-pricing approach also predicts that, given distribution of possible awards, legal procedure can still affect the incentive to sue. The option value of filing a lawsuit arises because the plaintiff has the choice to pursue litigation under favorable circumstances or to drop the suit in unfavorable situations. The more flexible the legal procedure, the more choices the plaintiff has, the greater the option value of the case.

In this respect, the option-pricing model provides one possible explanation for the explosion of litigation. A variety of scholars, including Huber, have argued that jury awards have become more uncertain, legal standards more unpredictable, and legal procedures more flexible.<sup>23</sup> All of these developments increase the value of litigation options and thereby increase the incentive to sue. In addition, as the number of suits rises, and the legal process slows, the value of litigation options is further enhanced.

<sup>23</sup> Peter W. Huber, Liability: The Legal Revolution and Its Consequences (1988).