Litigation Risk Management & Settlement Valuation

The Application of Litigation Decision Trees to Understanding and Managing The Risks of Litigation and Settlement

by Bruce L. Beron, Ph.D.
President
Litigation Risk Management Institute
34 Coquito Court Menlo Park, CA 94028
650.854.1914 Fax: 650.854.2417
bruceberon@ lrmi.com www.litigationriskmanagement.com

Introduction

How many times have you not been confident that you were making the best recommendations for settlement or for pretrial or trial strategy? And, even when you were sure that you were making the best decisions, how often have you been unable to communicate successfully to others the rationale behind your decisions? Litigation Risk Management/Settlement Valuation, the application of decision and risk analysis to managing litigation risk, is a logical, comprehensive discipline that can be used to understand, optimize, and communicate the litigation management process. In this article, we explain the principles on which Litigation Risk Management/Settlement Valuation is based, present an analysis of an actual case, and discuss the benefits of using this approach.

A primary objective for attorneys in litigation is to make the best choices regarding: How much to settle for? How to allot efforts in pretrial discovery and depositions? Which pretrial motions to emphasize and which to fight the hardest? What strategy to adopt for the trial? Whether to appeal or not? Yet, the best choices are not always made, often because of two factors - complexity and uncertainty.

It is well documented that the human brain has great difficulty dealing with more than seven factors at one time[1]. Yet even modest litigation entails many factors that must be taken into account when trying to make settlement or pretrial strategy decisions. What evidence might be gathered, successfully introduced, and made believable? Whose deposition should be taken? What are the legal issues? What are the factual issues? How do the legal and factual issues relate to both liability and damages? Will the outcome of this case have precedential implications for other cases?

Other dimensions must also be considered: the time before final judgment is rendered; the cost of litigation; the value (cost) of injunctive relief; the impact of the trial or settlement on business; the effect on stock price; the client's time value of money; and

the client's attitude toward risk-taking. Even if this complex multitude of issues and facts could be understood, one would still have to deal with the associated uncertainties. We do not know what the depositions will show, how the jury will interpret the facts, how much it will award, how long the case will last, etc.

To make the best decisions, we therefore need both a systematic way for dealing with complexity and a method for understanding uncertainty. Litigation Risk Management/ Settlement Valuation provides both.

Litigation Risk Management/Settlement Valuation deals with complexity two ways. First, a problem is broken down into component parts in such a way that one has to deal with only a few, and often only one, factor at a time. Complexity is dealt with by a straightforward, logical combination of the individual factors. Second, the approach prescribes a systematic sensitivity analysis that prunes away unimportant issues and facts, doing so in a documentable, dependable way that effectively focuses resources and attention on the key issues and facts.

Although complexity can make decision-making difficult, uncertainty is a far greater obstacle to making good decisions. When we try to communicate our feelings and judgments about uncertainty to others, we invariably use words. However, there are intrinsic problems with words. Ask a group to give a range of probabilities (using numbers between 0% and 100%) for the following phrases that are commonly used to express the likelihood that a particular event will occur:

- It is very likely to occur.
- It will probably occur.
- It will almost certainly occur.
- It is likely to occur.

Having done so, you will make the following observations:

- The probability range for each phrase is quite broad, from about 50% to 100% for all the phrases.
- There is little distinction among the phrases; that is, they all have similar ranges.
- We can almost always find two people with distinctly separate ranges for the same phrase; i.e., 50-70% versus 90-100%.

Clearly, words are a poor way of communicating our feelings and judgments about uncertainty. They are vague and misleading, especially when many uncertainties must be combined to reach a correct conclusion. It is clear that we need an unambiguous language to deal with uncertainty: that language is

probability.

Before we analyze an actual case we need to review some of the basic principles of decision and risk analysis so that when we apply them to litigation they will be more readily understandable.

Principles and Concepts

In this section, we will deal primarily with uncertainty. To make the ideas as clear as possible, we will consider a very simple problem. Simple pieces can ultimately be assembled into a complete picture allowing us to deal with problems of any complexity.

Let's consider a simple, uncertain proposition. You own a ticket that entitles you to call a coin toss. If you call the toss correctly, you win $100; if you call it incorrectly, you get nothing. This is obviously a pretty good deal, nothing at risk and a chance to win $100. What is the probability of winning? We can agree that there is a fifty-fifty chance of winning; thus the probability is 50% (or 0.5 - we can use either percentages or decimal numbers from 0-1 to represent the probabilities). We can now draw a decision tree to represent the venture (see Figure 1).

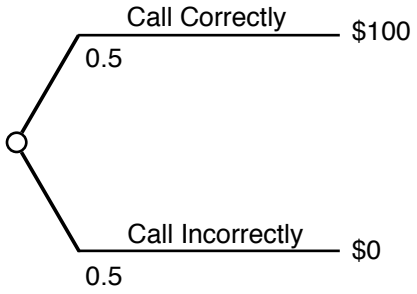

Figure 1 - A coin toss

The circle signifies an uncertain (uncontrollable) event, and the two branches show that there are two possible outcomes. Because *something* must happen, the probabilities on the two branches must add to 1.

To make decisions, we need a way to assign a value to this venture. We will use a measure called the *expected value* that is obtained by multiplying each outcome by its associated probability and adding up the products (see Figure 2).

In this case, the expected value is $50. Could you participate in this venture and walk away with the expected value? No. You will either walk away with $100 or nothing. What does the expected value represent? It represents the average amount you would get if you could play many times. However, in this case you can only play once. Even though you will get either $100 or nothing, the expected value is a good measure to start with in valuing the venture for decision-making purposes. Although it may not accurately represent what you

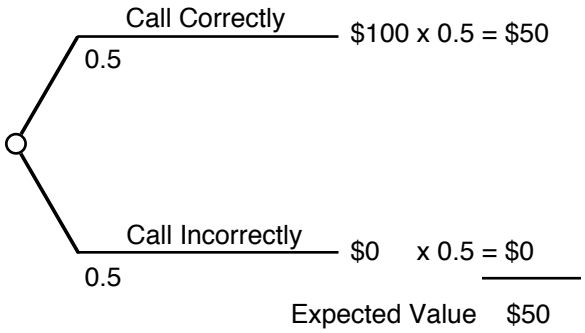

Figure 2 - A coin toss with the Expected Value calculation

will get from this one venture, if you have many ventures, and do a good job of establishing probabilities (we discuss what that means further on), and then add up the expected values of all your ventures, that number has meaning. It should be a good estimate of what all your ventures are worth together. For example, if you owned 100 tickets for coin tosses, it would be safe to say that the set is worth 100 x $50 = $5,000. (In fact, there is a 95% chance that you will realize between $4,000 and $6,000). Therefore, the expected value is a good measure of the value of a venture. Now we have to consider risk.

"But," you say, "this is a riskless venture. I can't lose any money." Perhaps, but we can also view your chances in a different way: Suppose you had an opportunity to sell your ticket before you called the toss. What would be your minimum selling price (your reservation price), the price above which you would take the money and run, and below which you would take your chances? Most people would hold out for pretty close to $50. However, suppose that a correct answer would win you $10 million. Would you still hold for $5 million, or would you take $1 million and run, rather than facing a 50% chance of coming away with nothing? Thus, in fact, there is risk.

It is quite reasonable to give up some of the expected value to avoid uncertainty. The difference between the expected value and our minimum selling price (reservation price) is the risk premium. Note that your reservation price has nothing to do with what you might get in the marketplace. For example, you may not be able to find anyone who is willing to pay your reservation price and thus you will prefer to take your chances with the venture.

Let's take what we have learned so far and apply it to a simple litigate/settle decision.

Settlement Valuation: Choosing Between Litigation & Settlement

Suppose that we represent the plaintiff in a case, and our best judgment is that there is a 50% chance of winning the case. If we win, the judgment will be $100,000 (with no uncertainty in this example). Discovery is complete, and just before the trial is due to begin the defendant offers to settle for $30,000. (We ignore attorney fees, time value of

money, etc. to simplify the example.) Should we accept the offer? To begin the analysis, the first thing we would do is to draw a decision tree (see Figure 3).

The first node is a decision point, represented by a square, and we have two choices - to settle now or to continue to trial. If we settle now, we can realize $30,000 and if we go to trial we have a 50% chance of realizing $100,000 and a 50% chance of coming away empty-handed. The expected value of the trial is $50,000 and is shown in the circle near the trial node. If our client is an expected-value decision maker, willing to play the

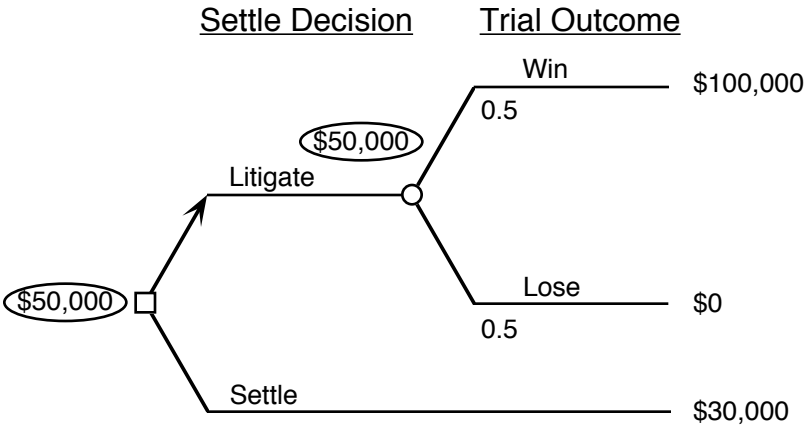

Figure 3 - A simple litigation decision tree

odds without giving up anything for risk, we would advise continuing to trial. This is shown by the arrow pointing to the trial outcome node and the $50,000 in the circle at the decision node. If, on the other hand, $30,000 represents a great deal of money to the client, it may be in their best interest to accept the settlement. There are rigorous, well-documented techniques (known as utility theory) for dealing with the risk attitude of the client and for calculating the risk premium, but they are well beyond the scope of this article. However, from experience in dealing with many decision analyses of risky business ventures and litigation analyses of suits with large consequences, we can say that the expected value is a very good number to use to represent the value of a lawsuit to a corporate client. Only if the possible outcomes are significant (>20% of net worth) need the risk corrections be made to see whether or not the calculated value is affected.

Litigation Risk Management/Settlement Valuation will give you and your client a reservation value for the case under consideration, a value that you will be confident of and comfortable with, that can be explained and defended. This reservation value is a necessary prerequisite to a good negotiating strategy. Too often, negotiations are entered into with only some vague feelings about the value (positive or negative) to the client and the negotiation becomes the means and the end.

Before we discuss strategies, let's take a closer look at the meaning of the probabilities we have been using.

Probabilities

When we discussed the coin toss, the 50% probability of heads or tails was obvious (assuming, of course, a fair coin). Suppose now that I flip a coin and cover it up with my hand so that you can't see it, but I peek at it. What is my probability that the coin is heads? It's either 0 or 1 (depending on whether the coin landed tails or heads). What is the probability that the coin is heads (you still haven't seen it!)? 50%! How do we explain the apparent discrepancy between the same coin toss and different probabilities? The probabilities represent a quantification of a state of knowledge and judgment. You and I have different states of knowledge about the coin, therefore we have different probabilities. Here we are using Bayesian statistics, not the classical statistics that most of us have been taught; the latter deal only with the frequency with which the coin will land heads or tails, not its state on any one toss.

Unlike the coin, for which there is an observable frequency that we could measure by tossing it many times and counting the number of heads and tails, each litigation case happens only once, and we can never measure a frequency for the particular trial under consideration. The probabilities represent the best judgment, knowledge, and experience that we can bring to bear on the particular uncertain outcome. There is *no correct probability.* If we asked someone who could foretell with perfect accuracy the outcome of the trial or of any single issue, "Will we win?" the answer will be a "yes" or "no", not a probability. This is a very important point. A probability is correct only to the extent that it accurately represents the state of knowledge and judgment of the person being asked. There are well-known biases in the way we think about probabilities and uncertain outcomes [2]. The most important of these is the tendency to think we know more than we do. We make our probability distributions too narrow for our true state of knowledge. This has been demonstrated in hundreds of tests in which executives and professionals were asked to encode their own probability distribution on knowable quantities (e.g., the air distance from Moscow to Beijing). They were asked to set outer limits on their distributions so that there would be only a 2% chance that the correct answer would lie outside their limits. In fact, the correct answers fall outside their limits about 50% of the time. The world is much more uncertain than we would like to think it is! Fortunately, techniques have been developed to counteract such biases,[3] and they are straightforward to use.

The question remains, of course, whether or not a particular person is a good judge of an issue. We all have good intuitive ideas about who the best experts are on particular questions, but by encoding probabilities we can calibrate their judgments quite readily. This leads us directly to our next topic, the value of information.

Value of Information

If our expert on a particular question has had much experience in similar cases, we would naturally be more confident of the resulting probabilities and would not feel

compelled to research the topic more thoroughly. By using our decision trees we can quantify our comfort with our expert's knowledge and calculate the value of better information (reduced uncertainty). We first must answer this question: What is the most we would be willing to pay a clairvoyant (someone who can foretell the future with perfect accuracy) to answer our question, "Will we win the trial?"

Let's go back to our simple litigation tree, which has an expected value of $50,000. What would the tree look like if we knew that we would win given that we went to trial? (see Figure 4).

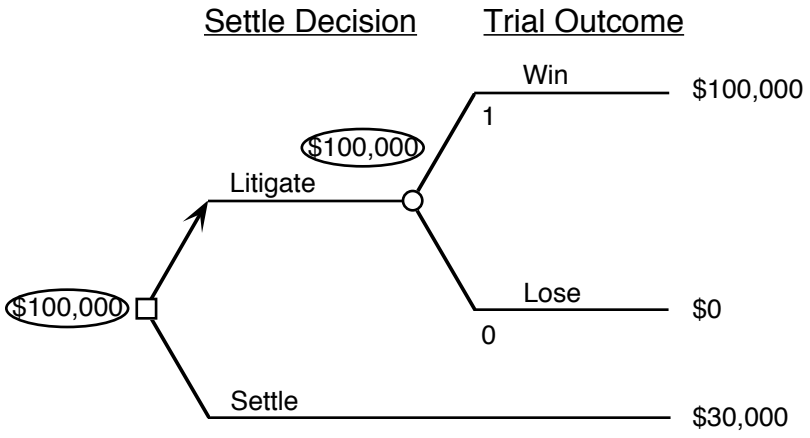

Figure 4 - The simple litigation tree if the clairvoyant says that you will win

Clearly, if we knew we were going to win, we would not settle; rather we would go to trial and win $100,000. If we knew we were going to lose, we would settle and get $30,000 (see Figure 5).

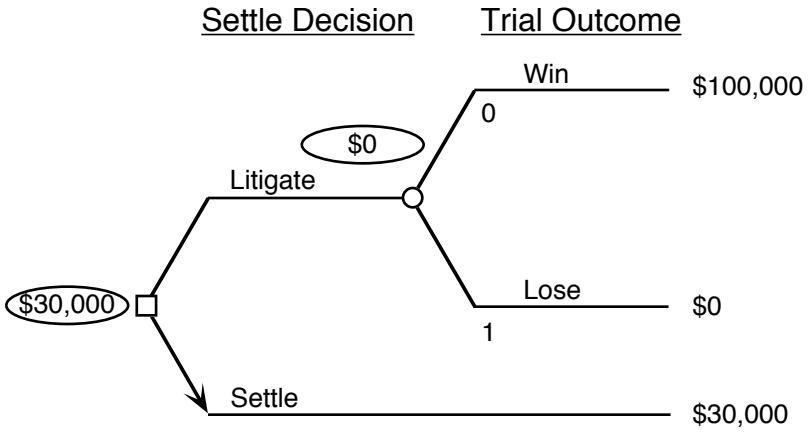

Figure 5 - The simple litigation tree if the clairvoyant says that you will lose

However, we do not know beforehand whether we will win or lose; therefore we must look at the probability that our clairvoyant will tell us that we will win or lose (see Figure 6). Our best information as to what the clairvoyant will tell us is, in fact, the

same as our judgment as to the likelihood of the trial outcome.

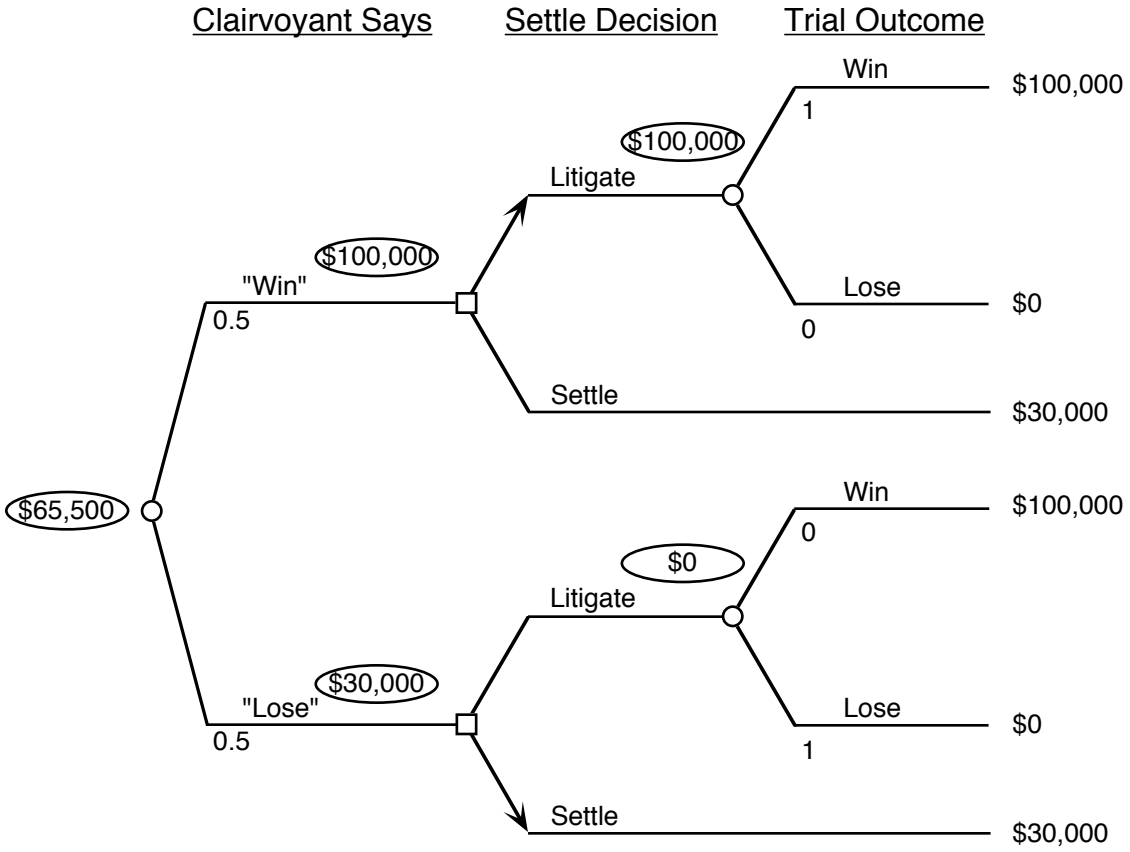

Figure 6 - The decision tree for the value of perfect information

The case is worth: 0.5 x $100,000 (the clairvoyant tells us we will win) + 0.5 x $30,000 (the clairvoyant tells us we will lose) = $65,000. This is the value with perfect information.

Because our value without further information was $50,000, the value added by perfect information (clairvoyance) is $15,000.

Value with perfect information	$65,000
Value without further information	-$50,000
Value of perfect information	$15,000

This is the most we would pay for perfect information about the outcome of the trial. Note that the only reason that the information has value is that we can choose whether to settle or go to trial. If there were no settlement offer, knowing the outcome of the trial would not buy us anything. (Obviously, in a real case your client would save the cost of going to trial and this would be included in an actual analysis.) Information only has value if a decision might be changed as a result of the information. In this case, the decision is whether to settle or litigate. If we were to determine that further research to

improve the quality of the probability judgments would cost $15,000, we would decide that it is clearly not worthwhile. We would only pay that much to know the outcome of the trial with certainty, and research could never be that good - at best, it would only change our probabilities. We can, of course, calculate the value of imperfect information, but doing so is more complicated and beyond the scope of this article.

What is important to realize here is that we can determine the economic value of further research and discovery before we undertake it. However, even if we do not have the option of settling, research and discovery can always improve the chances of winning.

Value of Control

Although a clairvoyant, who can foretell the future with perfect accuracy, is a valuable asset, a wizard, who can make the future turn out the way you want it to, is even more valuable. How do we determine the value of making the trial turn out the way we want? We return to our decision tree (see Figure 7). (We don't need the litigate/settle decision for calculation.)

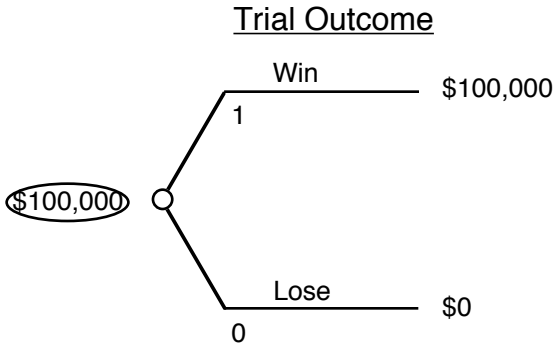

Figure 7 - The value of the case with perfect control

What is the case worth if we are certain to win? Clearly, $100,000. What was the value without any control? $50,000. Therefore, the value added by the perfect control (perfect because we are 100% sure of winning with it) is $50,000.

Value with perfect control	$100,000
Value without control	-$ 50,000
Value of Perfect Control	$ 50,000

Unfortunately (or fortunately, depending on which side of the case you are on), perfect control is not available; but imperfect control is. Suppose that by running some laboratory tests and bringing in more technical experts to testify in the trial, you could raise your probability of success from 0.5 to 0.6. Would it be worth spending an extra $7,000?

The value of the case is $60,000 if the probability of winning is 0.6 versus a value of $50,000 if the probability is 0.5 (see Figure 8).

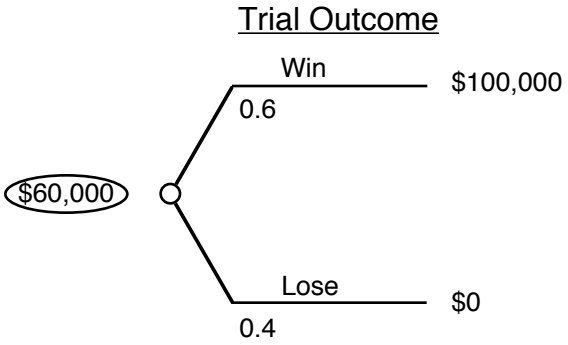

Figure 8 - The value of the case with imperfect control

Value with imperfect control	$60,000
Value without control	-$50,000
Value of imperfect control	$10,000

Clearly, it is worth spending the extra $7,000. This is obviously an oversimplified example, but these principles can be applied in actual cases. Imperfect control is an important concept in determining pretrial and trial strategy, for it allows you to choose the best strategy, to refine it, to understand the basis for your decisions, and to explain the rationale to your clients and colleagues. Before we look at a more realistic analysis, let's consider the question of the quality of decision-making.

Decisions versus Outcomes

Suppose that we are considering our original settle/litigate decision. The client is a corporation, for whom risk taking is not a consideration, and you have reviewed the analysis with the client and both agreed that you should proceed to trial. You are both confident that you have made a good decision. You have made a judgment about the quality of your decision that is independent of the outcome (win or lose at the trial). You may go to trial and have a bad outcome (loss) but that doesn't affect the quality of your decision.

Because everything was explicitly presented to the client, he or she can't claim after the trial that you should have accepted the settlement offer. They may claim you did a poor job at the trial, but you told them explicitly that there was only a fifty-fifty chance of winning. In fact, it is difficult to judge the quality of decision-making from a single case. If, however, you had ten cases in which you had estimated a 50% chance of winning and had won only one, or several times had not foreseen some important issues that affected the outcome, the client would have some justification for questioning your judgment.

In sum, good outcomes are outcomes we like. Good decisions are decisions that are consistent with our knowledge, judgment, experience, and preferences. Unfortunately, we can't control outcomes; all that we can do is to make the best decisions that we can and know that good decisions will increase the chances of getting a good outcome. Litigation Risk Management/Settlement Valuation is a tool for understanding and managing the risks in litigation and helping you choose between litigation and settlement. Let us now consider a more realistic case, taken from an actual (but disguised) analysis.

Actual Case

This analysis was conducted for the general counsel of Firm A, the plaintiff, which was suing Firm B for infringing on a patented manufacturing process. The critical issues and outcomes were determined to be:

- The validity of the patent
- Firm A's candor in its patent application
- B's infringement of the patent
- The date A had given notice to B of the infringement
- The appropriate royalty

For A to win any judgment, it would have to win on the issues of patent validity, candor, and infringement. If it lost on the issue of candor, it would not only not win any judgment, but would also be liable for B's legal fees. A claimed it had notified B of the infringement on January 1, 1978, and B claimed it had been notified on January 1, 1981. In either case, the patent is due to expire at the end of 1985. The date of notification determines the total sales to which any royalties would be applied.

The general counsel and the patent attorney judged that there was a 75% chance that the patent would be held to be valid, and a 70% chance that the court would find that they had used candor in their application. There would be an 80% chance that there was an infringement and a 65% chance that the court would find that B had been notified at the earlier date. Finally, they set the following probability distribution on the royalty that they would be awarded should they prevail on the other issues:

- 25% chance that the royalty will be 6.0%
- 50% chance that the royalty will be 2.5%
- 25% chance that the royalty will be 1.5%

The sales against which royalties would be charged were $6 million per year. Should they win, general counsel did not expect to receive any payments for three years. The corporate discount rate of 15% was to be used to calculate the present value of all the

cash flows. The information was put together in a litigation decision tree (see Figure 9).

The expected value of $101,000 is shown in the circle at the beginning of the tree in Figure 9. However, we have more information here than just the expected value. If we plot the sum of the probabilities that fall in bins of $200,000, we obtain the plot shown in Figure 10.

This plot gives us a clear picture of the risks and rewards of litigation. There is, in fact, a 58% chance that A will lose money in pursuing this case, but the losses are relatively small. There is only a small chance of winning on all the issues and obtaining a large royalty, but that outcome is quite valuable (approximately $1.5m). Most executives would be comfortable making a litigate/settle decision if they had this kind of information at their disposal.

The case was settled before the trial started for an amount acceptable to A's CEO. Had the case gone to trial, simple calculations like the ones we did above would give guidance for pretrial and trial strategy.

Conclusion

Litigation Risk Management/Settlement Valuation is a tool to help you understand and manage the risks of litigation and assist you in determining a reservation price for your settlement negotiations. It is a process, not a product. The result of an analysis is not a number, but a state of mind, of satisfaction and comfort with the recommendations of counsel. It will lead you to better choices by making maximum use of your intuition, knowledge and experience. The analysis will usually not suggest some unexpected course of action because it is a summary and quantification of your own best understanding of the case. Moreover, it will enable you to explain your decisions and recommendations. It provides a way of meaningfully interfacing the attorney's expertise and the businessman's expertise and values. It is a valuable aid in settlement negotiations by providing an objective understanding of the value of the lawsuit. No one has come up with a way to guarantee good outcomes. Until they do, the best you can do is to make the best decisions you are able to. Litigation Risk Management/ Settlement Valuation is a powerful tool to help you make better decisions.

References

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[3] *Spetzler, C.S. and Stael von Holstein, C.S., "Probability Encoding in Decision Analysis"*, Management Science, *Vol. 22, No. 3, November 1975, pp. 340-355.*

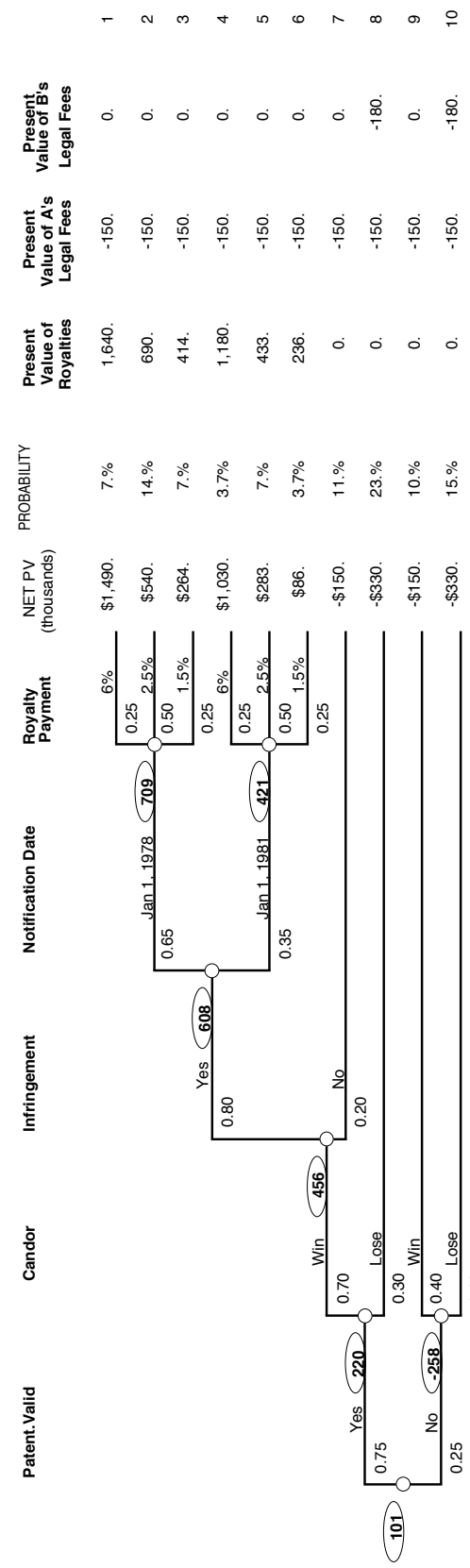

Figure 9 - The decision tree shows all the consequences of each outcome, the net cost/value, the likelihood of each outcome, and the expected value

Figure 9 – The litigation decision tree shows all the consequences of each outcome, the net cost/value, the likelihood of each outcome, and the expected value of the litigation.

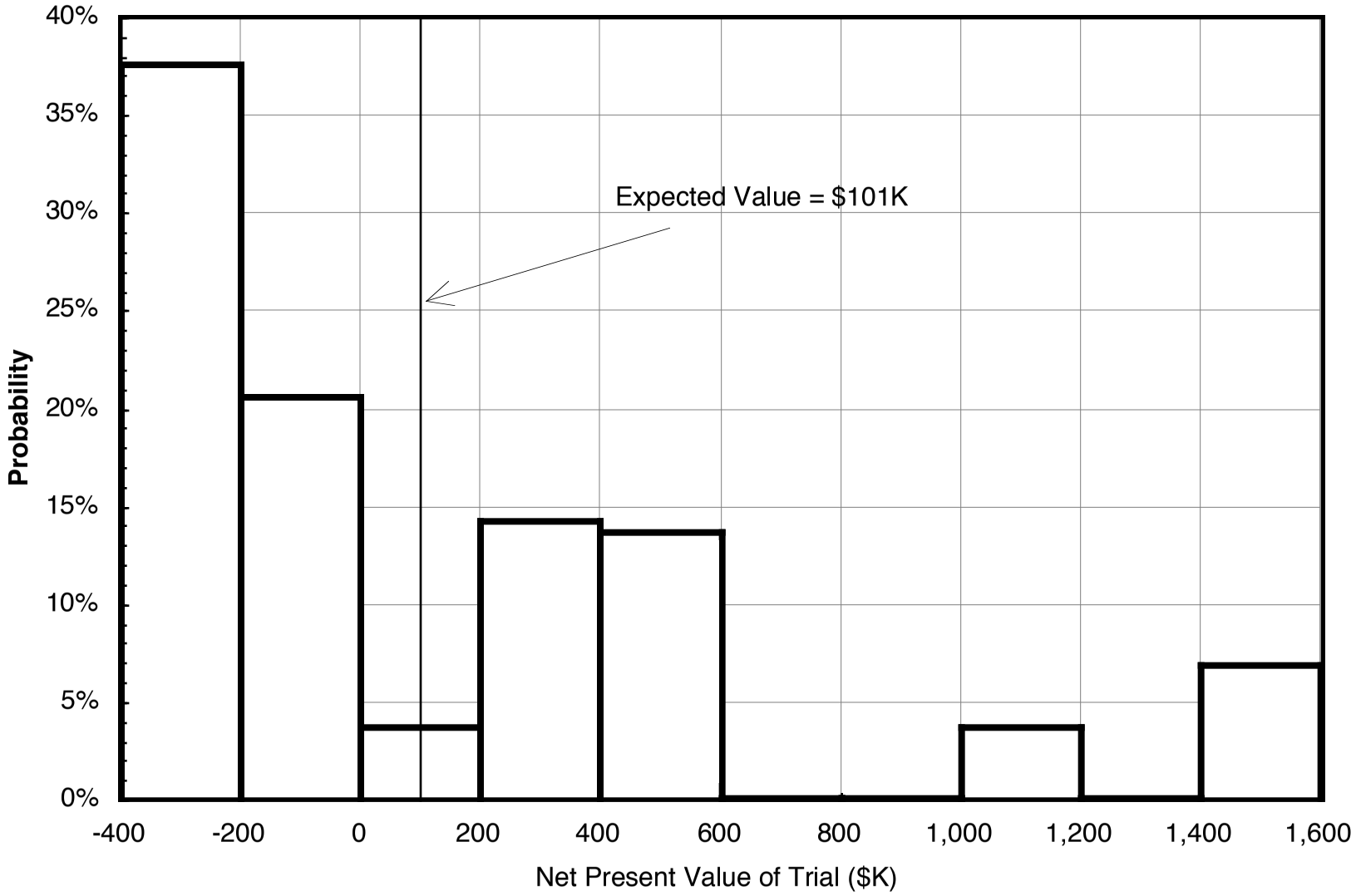

Figure 10 - The probability distribution shows the range of all the outcomes and their likelihoods as well as the expected value