The Valuation of Litigation

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Litigation Analysis

Litigation analysis is complex, requires a strong understanding of the legal process, and uses various finance and statistical disciplines. This process involves managing and organizing extensive volumes of information as well as working closely with multiple attorneys and staff members. Quantifying damages, legal claims, or litigation is difficult because measuring and identifying future loss in value attributable to an alleged bad act or resulting damage is imprecise. It involves projected future outcomes that cannot be demonstrated with the same degree of precision as recorded events. Therefore, in an analysis, one must hypothesize the future in the absence of an unforeseen bad act as well as the negative actions that alter current circumstances and lead to diminished financial return or condition.

Valuation of a legal claim necessitates an estimation of probability, timing, and amount of the recovery of damages and a technique that models alternative expected events to demonstrate probable future economic out- comes. A decision tree is an applicable tool that develops "if then scenarios" translating qualitative future possible outcomes into the quantified value of these outcomes. This article discusses the design, practical application, and mandate for a compelling model that measures the market value of a litigation claim for economic damages that have resulted from bad acts.

Methodology

When introduced to the concept of valuation of litigation, one usually envisions the determination of economic damages. Litigation and damages, however, are two distinct concepts, and the two call for different valuation techniques. Damages refer to the monies, if any, that are awarded to the plaintiff in a case determined in his or her favor. Litigation, on the other hand, refers to a court proceeding that begins with the filing of a lawsuit by one party (the plaintiff) claiming that certain bad acts by another party (the defendant) have caused economic damage. The value of litigation (also referred to as the value of a litigation claim or the value of a lawsuit) differs from the value of damages in that the former encompasses not only the potential damages expected to be awarded, but also the risks of losing, the legal costs involved with litigating the case, and the time a party would have to wait before damages, if any, are received. The value of litigation is lower than that of damages because it *discounts* the expected award by the efforts invested in obtaining this award, i.e., time, risk, and costs.

The model traditionally used in valuing litigation is a decision tree that details the courses and events that the subject legal action could have taken to reach a conclusion, the time it would have taken to bring the action to an end, the probability of each outcome, and the time value of the monetary award (if any) for each event. The

methodology outlined in this article relies on the traditional concepts of financial theory and statistics, such as present value, discount rates, probabilities, net profit, and risk. These concepts are presented in the first section of the methodology discussion. Additional advanced statistical techniques, such as scenario analysis and Monte Carlo simulation, are also applied and are discussed in the second section of the methodology review.

Decision Tree Analysis

A decision tree depicts all of the possible outcomes of a decision or event. In statistical analysis, the decision tree is commonly used to determine the most favorable or the most likely sequence of decisions and events. The method, which incorporates the probability and timing of each event, can also be used to calculate the value of a string of possible events. Each event in the tree represents the probability of an outcome and the expected payment if that outcome occurs. The numbers at the end of each branch are the estimated values of ending the string of events at those points. This is sometimes referred to as "conditional payoff" to denote that the payoff depends on a particular sequence of events and a particular outcome.

A decision tree analysis is appropriate for valuation of a lawsuit because it captures the complexity of a legal action through a relatively simple and flexible graphic depiction. Exhibit 1 depicts an example of a simplified decision tree designed for the valuation of a litigation claim.

Probabilities

Decision tree analysis relies on the concept of probabilities. Probabilities are used to quantify the likelihood of possible events or courses of action and are represented as a number between 0 and 1. The closer an event's probability is to 1, the more likely it is to occur. At each node of the tree, each branch reaching out of that node is assigned a probability; the sum of the probabilities for all the branches reaching out of that node is 1. For instance, after a series of actions, such as mediation or a summary judgment hearing, the case may continue to trial. At the trial node, three outcomes are possible: the verdict is rendered in favor of the plaintiff (A), the verdict is rendered in favor of the defendant (B), or the parties settle prior to the verdict (C). Events A, B, and C may have, for example, probabilities of 0.3, 0.1, and 0.6, which sum up to 1. See Example 2.

Further, the model uses combined probabilities, i.e., the combined probability of event A is not 0.3, but rather 0.3 multiplied by the probabilities of each of the prior events leading to event A. The s um of the combined probabilities of each of the end nodes of the decision tree is 1, which means that the model captures all of the possible outcomes of the legal action undertaken. See Example 3.

Time Value of Money

Litigation can be an extensive process. The claimant will not k now the outcome, and will not receive the award (if any), until the legal action is completed. It is therefore important to consider the time value of any expected monetary award. At each end node of the model, the estimated payout is multi plied by its conditional probability and then present-valued from the time the payout could have been expected, given the particular path, to the valuation date. The valuation date may be the initial filing date or any other date, as specified by the client. It may be the date at which a settlement is proposed. This date is relevant when the appraiser is engaged to value the lawsuit to determine the reasonableness and fairness of the proposed settlement should the parties decide to reject it and go forward with the trial with maturities matching the lengths of the legal action's possible paths.

For example, one branch of the decision tree may assume that the case would go to trial and be decided by the judge in favor of the plaintiff approximately two years after negotiations are held through mediation; the model might further assume a payout of $100 million. The time value of money concept indicates that the value of the $100 million payout at the valuation date is the value of the estimated payout discounted at an appropriate discount rate for a period of two years, and adjusted for the combined probability of this event.

Discount Rate

Time value of money refers to the fact that a certain award a year from now is worth less than the same award today, due to the risks associated with the uncertainty of the future award and forgone interest. The discount rate is the factor that quantifies the value today of $100 to be received in the future. The uncertainty associated with the receipt of the future award is already accounted for through the probabilities used in the decision tree. Therefore, the appropriate discount rate should be the risk-free rate. Suitable rates of return can be derived from Treasury obligations.

Assumptions of the Decision Tree

1. The specific inputs of the model, also referred to as assumptions, include:
2. The different paths the case could take in the legal system.
3. The time associated with each of these paths of action.
4. The probability of each outcome, which includes the plaintiff's chances of success.
5. The potential monetary rewards of the different paths (total damages awarded by the court if the verdict or the decision of a potential arbitrator is rendered in favor of the plaintiff; zero if the verdict is rendered in favor of the defendant; or some other amount if parties reach a settlement).
6. The legal costs involved with the litigation.
7. The appropriate discount rate(s).

Legal Paths

The first task is to map all possible events and paths, such as mediation, arbitration, summary judgment, abandonment, settlement, verdict, or appeal. If the parties do not reach a settlement and prefer to go to trial, the verdict can be appealed by either party to the appropriate court of appeals. A decision in an upper level court could eventually be appealed to a state supreme court or the U.S. Supreme Court, or result in the case being remanded back to the original court. To develop the mapping of all possible events and paths, the appraiser must rely on the litigation attorneys involved in the case at hand, who are well versed in the procedures, practices, and track record of the court in which the subject case was filed.

Probabilities

Once the decision tree is mapped, representing in graphic form all of the possible events of the legal action, probabilities are assigned to each branch (or node) of the decision tree. Probability inputs are uncertain by nature and vary by case. Probabilities, or odds, of the case going one route (e.g., arbitration rather than trial) or chances of winning, are estimated based on inputs from legal counsel involved in the case in combination with a review of allegations and defenses (the valuation expert does not make legal judgment; rather, he or she relies on the expertise of the attorneys on the case). The determination of the model's probabilities relies on several factors,

such as: (J) a n analysis of the claims of the plaintiff and the defendant's defenses, (2) the track record of the court in rendering verdicts and awarding damages, and (3) the nature of the case at hand (e.g., certain types of cases are seldom heard by state supreme courts or the U.S. Supreme Court).

Damages

The third major input of a decision tree analysis is the determination of the potential damages awarded by the court (if the opinion is rendered in favor of the plaintiff) or reached through settlement This phase involves the quantification of the damages suffered by the plaintiff and any potential interest and punitive damages. In addition, the amount at which the parties settle is generally lower than the potential damages awarded by the court, if any.

The quantification of damages for the decision tree analysis can be the work of the valuation expert in charge of valuation of the lawsuit, or can be based on valuations performed by other experts called to testify for the defendant or the plaintiff. When using the analyses conducted by other experts, the litigation valuation expert may use all or only selected findings.

In addition to the monetary damages that are expected should the verdict be rendered in favor of the plaintiff, one needs to estimate the level at which the plaintiff and defendant are willing to settle. This amount, which is usually a fraction of the damage calculation, is determined through discussions with the client and his or her legal counsel.

Legal Costs

Litigation proceedings generally entail substantial legal costs, which amount may significantly reduce the net payout. For example, legal fees in patent litigation commonly exceed several million dollars. The magnitude of the legal costs typically depends on the length of the legal action, the complexity of the case, and the notoriety of the law firms involved. Information regarding legal costs is provided by the attorneys on the case.

Discount Rate

The risk-free rate is the appropriate discount rate to be applied in a decision tree analysis, since all the risks related to the legal action are captured by the probabilities assigned to the model. A risk-free rate that is based on Treasury securities with maturities matching the lengths of each of the tree's branches is appropriate.

Conclusion of Claim Value

The concluded value of a lawsuit claim is the sum of all the branches of the decision tree, whose values are determined based on the potential (if any) payout, net of legal fees, adjusted for the combined probability of the branch, and present valued to the date of valuation. This value indicates the expected net payout to the plaintiff, expressed in today's dollars on a risk-adjusted basis. Such value may be used to determine if a settlement offer should be accepted, if a decision should be appealed, if a lawsuit should be filed, or if an investment should be made.

Scenario Testing

The decision tree analysis discussed in the previous section provides an indication of value for the lawsuit as of a certain date. One of the drawbacks of such analysis is the inability to correctly capture the uncertainty in the assumptions. For instance, the probability of the court of appeals overturning the lower court's decision may be estimated to be 0.2 based on inputs from legal counsel familiar with the legal system and the case at hand. However, it is likely that legal counsel indicates a probability range of, say, 0.1 to 0.25. While a single decision tree cannot use an input expressed as a range, scenario analysis can.

Basics

Scenario analysis, or scenario testing, is a process designed to analyze the most likely outcomes by considering alternative scenarios in an uncertain environmenti, Scenario analysis involves the identification of a set of uncertainty drivers within a particular model that calculates outcomes from the possible alternative paths of those uncertainty drivers. In finance and economics, drivers of uncertainty may include factors such as competitive behavior, regulatory environment, industry consolidation, and demand evolution. Corporate budgeting decision-makers commonly use scenario testing because this tool allows for a more precise forecast of the likely internal rate of return or net present value of an investment despite its uncertain future. In addition to finance and economics, scenario testing is used in geo-politics, sciences, and other disciplines because it is a tool readily applicable to problems generally expressed as a set of uncertain and variable inputs that influence an outcome.

Financial projection models such as discounted cash flow models and investment net present value calculations rely on a set of assumptions necessary for the construction of the forecasts. However, one financial projection model is the result of the selection of *one* particular set of assumptions, although most of the assumptions relate to variables that, by nature, are not predictable with certainty. The use of scenario testing circumvents this limiting proposition (the use of *one* particular set of input values) by generating multiple scenarios with each input taking different values, assigned by the user. The output of such a scenario analysis can be expressed either as a range of possible outcomes, a most likely outcome, or an average outcome. The result can then be used as the concluded value of a specific model (e.g., the indication of value resulting from a discounted cash flow model) or can be interpreted relative to a set of constraints (e.g., the net present value of an investment relative to other possible investments in a decision-making process).

Monte Carlo Simulation

Monte Carlo simulation is a type of scenario testing that randomly generates values for the input variables[ii]. While a scenario analysis generates multiple scenarios based on discrete outcomes for the input variables, the Monte Carlo simulation runs several hundreds or thousands of trials with randomly generated input values from specified probability distributions. Although most scenario testing can be accomplished manually (however, the simulation is typically limited to a handful of scenarios, such as conservative, base, and aggressive scenarios), a Monte Carle simulation requires the use of a software program, often referred to as a risk and decision analysis tool.[iii]

Relative to a single spreadsheet model or even scenario testing, a Monte Carlo simulation is a more powerful tool that allows the user to determine with greater certainty the probable value, or the range of probable values, for the out- put variable given a set of assumptions expressed not as discrete but as a universe of possibilities. Monte Carlo simulation is widely used in the financial industry and is a particularly important tool for the valuation of complex securities. In addition, this tool can be used to determine how sensitive a specific model is to a particular input variable.

Conclusion of Claim Value

The application of a scenario or simulation analysis to a decision tree designed for the valuation of a litigation claim provides additional support to the decision tree findings, as well as supplemental information in the form of statistics. The central tendency of a simulation analysis may be used as the final indication of value. This value represents the most likely payout that the plaintiff could have anticipated from the litigation, considering the various paths that the legal process could have taken, the diverse assumptions that one has to make at the onset of the process, and the different computations of damages that the valuator performs based on available information.

Reynolds v. Beneficial National Bank

The cornerstones of the valuation methodology discussed in the prior section were highlighted in the Seventh Circuit's decision in *Reynolds v. Beneficial National Bank.*[iv] The appeals court challenged the decision of a lower court regarding the reasonableness of a settlement, on the ground that such decision lacked a thorough analysis of the damages and recoverable value to the class. According to the appellate court, the analysis should have included an estimate of the range of litigation's possible outcomes, the probabilities of these possible outcomes, and time value considerations.

The uncertainty of recovery does not provide sufficient justification to rubber-stamp a negotiated settlement. Federal civil procedure rules require court approval of any settlement that effects the dismissal of a class action. However, before such a settlement may be approved, the court must determine that the settlement is fair, adequate, and reasonable. In *Reynolds*, the appeals court held that: (1) attorneys representing persons who were not allowed to intervene had standing to appeal the trial court's judgment and (2) the trial court abused its discretion by approving the settlement. A settlement supported only by intuition-which fails to address and quantify case strengths, the range of possible outcomes, and the duration of the litigation is inadequate and unacceptable. It promotes poor, ineffectual lawyering and creates law that does not protect consumers that may have been harmed.

Overview

Consumers who borrowed funds through tax refund anticipation loans have filed more than 20 class action lawsuits against Beneficial National Bank and H&R Block since 1990. These consumers claimed that the bank and the company violated state and federal consumer finance laws and breached their fiduciary duties by offering tax refund anticipation loans at high interest rates without full disclosure. H&R Block arranged the loans, and Beneficial provided the financing. The typical loans, which were outstanding for a few days, charged interest rates exceeding 100% and easily comprised 25% of the anticipated refund. The consumer was not informed that Beneficial paid H&R Block a fee for arranging the loan and owned part of each loan. In addition to alleged violations of consumer finance and state fiduciary laws, the structure and circumstances of the loans led to the most damaging charge: that H&R Block's customers were led to believe that H&R Block was acting as their agent or fiduciary in preparing their income tax returns, but in actuality H&R Block was accused of being engaged in self-dealing, without disclosure.

Ultimately, most of the suits failed and none resulted in final judgment. However, in the late 1990s several suits withstood motions to dismiss and motions for summary judgment, and at least one case in Texas was slated for trial. Several consumers filed a class action in a federal district court in Illinois, and lawyers for the parties negotiated a settlement of that lawsuit. The settlement established a $25 million fund that would be used to pay claims submitted by consumers that had taken out a tax refund anticipation loan. The federal district court

approved the settlement with one revision; awarded the consumers' lawyers attorney fees of $4.25 million; enjoined a similar lawsuit filed in Texas on the basis that it may upend this settlement; and denied petitions to intervene that were filed by persons who objected to the settlement.

Criticisms of District Judge's Evaluation of Settlement

The appellate court decision stated that there was uncertainty as to whether the $25 million settlement was reasonable given the risk and potential return to the class of continued litigation. The decision also established that there was insufficient information to make a judgment on the settlement. "He painted with too broad a brush, substituting intuition for evidence and careful analysis that a case of this magnitude, and a settlement proposal of such questionable antecedents and circumstances, required." In his opinion, Judge Posner challenged the district court's evaluation of the reasonableness of the settlement in its approval and highlighted shortcomings of the district judge's evaluation of the settlement, including:

- A conflict of interest within different classes was unremarked.
- An "unsworn" and undefined damage estimate was relied on.
- Circumstances of the settlement demanded closer scrutiny.
- Legal representation of a certain class was certainly inadequate.
- Greater effort was needed to quantify the net expected value of continued litigation to the class.
- No effort was made to translate the district judge's intuitions.

A primary weakness of the settlement evaluation was the lack of a thorough analysis of the damages and recoverable value to the class. According to Judge Posner:

[D]etermining that value [of the settlement] would require estimating the range of possible outcomes and ascribing a probability to each point on that range, though as just noted, those outcomes must be discounted to the present using a reasonable, and in this case a steep, interest rate…a high degree of precision cannot be expected in valuing a litigation, especially regarding the estimation of the probability of particular outcomes. Still much more could have been done here without turning the fairness hearing into a trial of merits.

It is evident that a settlement is not reasonable merely because the prospects for the class, if the litigation continued, are uncertain. Consequently, intuition and "gut feelings" must be translated into reason and quantified into supportable value. A "responsible" evaluation and reasonable settlement identify the strengths of the plaintiff's case, present a range of possible damages, and account for the duration of the litigation. When a settlement precludes other claims against a defendant, the lack of adequate analysis and evaluation of damage claims in determining the fairness and reason of a potential settlement promotes collusive activities by the defendant. Specifically, the defendant is able to negotiate a weak settlement by targeting the most ineffectual lawyers, those that are "happy to sell out" other classes in exchange for generous attorney fees. Ultimately, approving unsubstantiated settlements based on intuition, despite the improbability of recovery, fosters an environment in which consumers are overly exposed to damage and their rights to receive a fair, reasonable recovery are disregarded.

Thus far, this article has reviewed the theoretical methodology to be used in the valuation of litigation as well as a real life application of the fundamental inputs. The article will now focus on a discussion of three cases in which the methodology has been used to assist clients in tax matters, decision-making, and bankruptcy.

Solvency: Northpoint's lawsuit Against Verizon

On 8/7/00, Northpoint Communications and Verizon Communications entered into an agreement whereby a new entity would be formed through the merger of Northpoint and certain Verizon assets. The new entity was to be owned 55% by Verizon, and become a national provider of DSL services. On 11/29/00, Verizon abruptly announced it was aborting the deal. Verizon pointed to Northpoint's recently reported lower-than-expected revenues, and deteriorating financial, business, and operating conditions. It asserted that these developments constituted good and valid reason to terminate its planned combination of assets and business with Northpoint consistent with the terms of the material adverse change clause of the merger agreement. Because no alternative financing had been identified, cash-strapped Northpoint filed for protection from its creditors under Chapter 11 of the Bankruptcy Code on 1/11/01. Northpoint then sued Verizon for economic damages totaling $3 billion as a result of Verizon's alleged breach of the merger agreement because, according to Northpoint, there had been no material adverse change as defined in the agreement.

The Preference Claim

At around the time of Verizon's announcement to quit the merger, Northpoint had made payments to certain creditors. Its general creditors claimed that Northpoint was not solvent at all times during the 90-day preference period, and that payments made during that period must be returned to the estate for distribution in accordance with the terms of the bankruptcy settlement. Northpoint clearly was not solvent during the period based on its balance sheet or the market value of its stated assets. Nevertheless, Northpoint's claim against Verizon, which was filed on 11/30/00, was a "contingent asset" for Northpoint during the 90-day period, and was not recorded on the Company's financial statements. There was a strong case to be made that Northpoint would have expected to prevail in its claim of breach of agreement against Verizon, and that the damages award would be so large that even the present value of the award would be sufficient to create positive net worth on Northpoint's balance sheet.

Solvency and the Valuation of the Contingent Asset

Therefore, if it could be shown that the market value of all of Northpoint's assets, including its contingent assets, exceeded its liabilities, the company would have been solvent at all times prior to the bankruptcy filing and no preference issue would have arisen. At the time of the hearing in Bankruptcy Court, approximately 30 months after the lawsuit was settled for an amount that was $181 million short of the amount required to demonstrate the Northpoint's solvency approximately four years earlier, the financial opinion demonstrated that, through a decision tree analysis and the use of Monte Carlo simulation, the expected value of the lawsuit at the time of its filing was $457.7 million. The expected value of the lawsuit added together with Northpoint's stated assets established that the market value of its total assets exceeded the total value of its liabilities by $115 million. Therefore, Northpoint had been solvent for the 90 days preceding the bankruptcy filing.

The analysis considered the facts that were known at the time of the preference period. Furthermore, it considered certain information involving contemporaneous events that was knowable at the time of the transaction and its cancellation. The information became known through discovery and certain testimony provided by the deposition of witnesses that proved integral to the transaction.

Decision Tree Analysis Applied to the Northpoint Claim

Northpoint's contingent asset was the present value of the potential litigation proceeds from the lawsuit filed against Verizon on 12/8/00, which could have been anticipated as early as 11/30/00, the date Verizon canceled the merger agreement with Northpoint. The valuation of the potential litigation proceeds was derived from a review of the documents produced in the actual litigation, discussions with counsel familiar with the litigation process, and the relevant expenses that would be incurred in pursuing this lawsuit to its final determination. The Northpoint model expresses the expected cost of each of the legal steps that were foreseeable and that could have been anticipated during the period 11/30/00 through 1/16/01 (the interval between Verizon canceling the merger agreement and Northpoint's bankruptcy filing), including the timing and length of these phases, the probabilities of each of the actions by the two parties, the related costs, and the expected outcome. The model employed to value the lawsuit used a decision tree contemplating all of the courses and concomitant events that the action could have taken through the court system, the time it would have taken to bring the action to the final determination, the probability of each outcome, and the time value of the monetary award, if any, for each event.

Based on an investigation of the information known at the time of the alleged preference, combined with discussions with litigators experienced in similar claims and the related legal process, certain general assumptions were necessary in the modeling. These assumptions combined the facts of the lawsuit and informed judgments of the legal process to facilitate probable outcomes of the claim. On filing the claim in court, the three possible paths the lawsuit could take included: mediation; trial without negotiation; and request for summary judgment Eight of the major factors used in the model are highlighted below.

- Timing of the request for summary judgment
- Possible outcomes of the request for summary judgment
- The trial and the possible outcomes of the trial and negotiated settlement during trial
- The appeal process by the losing party.
- Negotiated settlement during the appeal phase.
- Size of settlement based on expected damage award.
- Possibility of review of case by the California and U.S. Supreme Courts.
- The probability of each event in the path to possible outcomes.

Finally, damages were calculated that could be paid to Northpoint, whether either the trial court or the appeals court opined in favor of the plaintiff, based on information that was known or knowable during the period of 11/29/00 through 1/11/01. This information is highlighted below:

- The total economic damage claimed by Northpoint.
- The value of the merger consideration to have been paid by Verizon.
- The loss in equity value as measured by the decline in Northpoint's stock price just prior to and just after Verizon's announced withdrawal from the merger.
- The lost equity value assuming Northpoint would file for bankruptcy as a result of the termination of the merger agreement.
- The loss in equity value based on the terms of the merger consideration.
- The lost equity value based on Northpoint's stock price prior to the merger announcement on 8/7/00.
- The opinions of three experts regarding the economic damages incurred by Northpoint.
- The present value of each future economic event calculated at the risk free rate for the period for each corresponding event

Creating Alternative Scenarios and Calculating the Expected Value of the Claim

Combining the information with the process described above, two decision tree analyses were developed based on "more favorable" (Scenario A) and "less favorable" (Scenario B) assumptions from Northpoint's shareholders' vantage point Scenario A assumed the lowest legal costs, the shortest time for each event sequence to lead to a payout determination, and the highest payout either by court decision or through a negotiated settlement. Scenario B assumed the highest legal costs, the longest time to a payout determination, and the lowest payout either by court decision or through negotiated settlement. Finally, scenario testing was performed through the use of Monte Carlo simulation software in order to determine the most likely, or expected, value developed through the decision tree analysis, which is the market value of the lawsuit.

Income Tax: Telecom Earn-out

In this case, shareholders of a merged company needed to determine the value of an earnout received in a merger and reorganization. The opinion would be used for income tax purposes. The earnout was based on the 1998 EBITDA achieved by the company. In this case, EBITDA included the potential award from a dispute over revenue reimbursement. The earnout was capped at $20 million, which simplified the calculations.

Background

The subject company, "Pacific" is a competitive local exchange carrier[v] (CLEC) offering telephone services in the western United States. In 1995, CLECs received the authority from the Public Utilities Commission (PUC) to offer local telephone services. The Telecommunications Act of 1996 enabled Pacific to strike several interconnect agreements with incumbent local exchange carriers (ILECs)[vi] allowing for reciprocal compensation[vii] for termination of local phone calls.

Immediately after execution of the reciprocal compensation agreements, Pacific realized that the budding industry of internet service providers (ISPs) was a promising revenue source through local phone service termination. Pacific sought to take advantage of this potentially lucrative opportunity and began to offer collocation to ISPs. In June 1996, the first reciprocal compensation invoice of $8,000 was sent to Baby Bell. Over the next year the invoices to Baby Bell increased to over $1 million per month.

In August 1997, Baby Bell, by paying only 50%, asserted its dissatisfaction with the amount of reciprocal compensation that it was paying to Pacific. Later that month, Baby Bell filed a complaint in Superior Court seeking a declaratory ruling that the reciprocal agreement did not require payments for calls terminated at an ISP. Meanwhile, the issue of reciprocal compensation was decided by the PUC.
As of the date of the merger and recapitalization of Pacific, the PUC had yet to rule in the reciprocal compensation matter. However, the selling share- holders were faced with a situation in which the value of the earnout had to be determined for income tax purposes.

Analysis

The value of the earnout was determined using a decision tree to map out possible outcomes in the dispute. The legal battle would be fought in two steps: first the PUC would rule in the reciprocal compensation matter, and thereafter the court would determine damages if applicable.

Through extensive conversations with Pacific's management and the attorneys who litigated the case, assumptions were made regarding the possible paths that the case could take through the PUC and state court system[viii] . The assumptions included all possible instances of appeals in the case of a loss for Baby Bell[ix] . Each path was assigned a length of time required to achieve the end result.

Probabilities were assigned to each decision node. Conversations with management and legal counsel contributed to the development of the probabilities. Information that contributed to the decisions regarding probabilities included: the appetite for litigation of Baby Bell; research around jurisdictional issues; the willingness of Pacific to appeal unfavorable decisions; and the availability of funding to pay for extended litigation.

The final decision tree had 624 possible end results. Each outcome was present-valued and the resulting indication was used as the value of the earnout on the selling shareholder's income tax return. Neither tax return was challenged by the IRS.

Patent Infringement Investment in Lawsuit

The litigation valuation methodology can be used in connection with investments in patents when there is an alleged infringement issue. This case determines the possible infringement amount and the present value of the patent infringement lawsuit for a life sciences related patent.

Background

The client was contemplating an investment in a patent that covers modification of certain proteins. The current holder of the patent alleged that a large pharmaceutical company was infringing on the patent with one of its commercialized drugs. The drug was generating $2 billion of sales per year. The assignment consisted of a two-step process: (1) determining the historical and expected future amounts that the alleged infringer should pay the holder of the patent if found to be infringing and (2) calculating the present value of the patent, assuming litigation was necessary to receive royalty payments from the pharmaceutical company.

Analysis

The analysis of the historical and future sales of the drug was based on public filings by the pharmaceutical company, as well as sales forecasts by several investment banks following the company. The existing revenues of $2 bilion were projected to grow at double-digit rates for the next five years.

An appropriate royalty rate was determined using industry data and information from the pharmaceutical company. As part of the research, a patent infringement settlement involving the same drug and the same pharmaceutical company was found. Based on that settlement and several licensing agreements for drug enhancement technology, an appropriate royalty rate could be determined.
The resulting value for the patent was several hundred million dollars. However, this value did not consider the risk, cost, and time associated with litigating the case. These factors were incorporated through a decision tree. In addition, the decision tree accounted for the special circumstance of this investment, in which the investor would pay for all litigation-related expenses and in return receive 50% of all awards.

This case used a simplified version of the decision tree analysis with 13 different outcomes. The model was based on extensive conversations with intellectual property litigators and experts familiar with protein binding and modification. An estimated timeframe of 0.5 to 4.5 years was used to reach a final decision, and litigation- related

expenses ranged between $2.3 million and S5.5 million, depending on the length of the process. In this case, different discount rates ranging from 20% to 40% were used to derive a range of values. This was done to give the client a better. Understanding of the potential return on investment.

The 50% interest in the potential litigation award was concluded to be worth approximately $50 million net of all litigation related expenses. Subsequently, the client decided not to move forward with the investment due to issues entirely unrelated to value.

Conclusion

This article has presented the construct of decision tree analysis and simulation analysis and their application to the development of the market value of a legal claim. Consistent with all financial analysis, the output of the model can be no better than the quality of the information considered, as well as the integrity of the assumptions and parameters that form the scenarios. When certainty yields to probability and the variable factors that determine outcomes create the possibility of multiple solutions, alternative scenario modeling provides a compelling argument for expected value. The future is filled with uncertain outcomes, but disciplined tools can estimate both its expected value and its present value.

Endnotes

[i] See "Scenario Analysis" (www.wikipedia,org). See also scenario analysis seminar presentations by the Fuld Gilad Herring Academy of Competitive Intelligence (www.academyci.com) and by Wessex Institute of Technology, (www.wessex.ac.uk).

[ii] Defuso, McLeavey, Pinto nd Runkie *Quantitative Methods for Investment Analysis* (Association for Investment Management and Research, 2002). Pp 261-266; "What is Monte Carlo Simulation?," web presentation by Decisioneering Inc. regarding its simulation software *Crystal Ball 2000,* www.decisionengineering.com/monte-carlo-simulation.html

[iii] Several tool exist, such as Crystal Ball 2000 by Decisioneering, Inc., @Risk by Palisade Corporation, and Insight by AnalyCorp, Inc. These tools are add-ons to Excel, a widely-used spread sheet program.

[iv] 288 F.3d 277 (CA-7, 2002).

[v] Competitive local exchange carriers are the new companies that broke into the telecommunications industry after the deregulation and the enactment of the 1996 Telecommunications Act.

[vi] Incumbent local exchange carriers are the existing entities that operated in the telecommunications industry rior to the 1996 Telecommunications Act. All of the Baby Bells are examples of ILECS.

[vii] Reciprocal compensation is the practice by which two telephone companies share the fees collected of a phone call that was initiated in one phone company's area/switch and terminated in the other phone company's area/switch. As an example, if a Pacific Bell customer make as local call to an MCI customer, Pacific Bell would collect the entire charge for the call, but would in turn pay MCI part of the collected fees.

[viii] In a different case, a federal court had ruled that it did not have jurisdiction over reciprocal compensation matters.

[ix] Baby Bell was owned by a large, well-funded corporation that was know for its litigious nature. It was the consensus among all parties that the parent company would take this case as far as it needed to get a favorable outcome.