Risk and Reward

Litigation Risk Analysis: The Economics of Patents and Litigation, Part III

By Samson Vermont

Last month, we concluded that, despite the dramatic rise in patent filings and license income, patents are not always good investments. We also estimated the average dollar value of patents, yet acknowledged that our number was somewhat meaningless since a miniscule coterie of patents accounts for the brunt of overall patent value and therefore deceptively skews up the average of the "average patent." We then reviewed numbers showing that patents in certain technology areas are much more valuable than patents in others.

This month we touch on the costs of patent litigation (to be discussed in much greater detail in future installments). We also acquaint ourselves with the main focus of this column--analyzing suits with decision trees.

Patent Litigation Costs

Only 1.1 percent of all U.S. patents are ever litigated,[1] but when they are it's notoriously expensive.[2] For instance, by the time they're all disposed of, the patent suits filed in 2000 will alone generate roughly $4.2 billion in legal fees.[3]

Patent litigation is expensive for three main reasons. First, patent law is one of the most ever-changing and vexing areas of the law, and patent litigation entails legal and technical issues that are subtle to the point of evanescence. [4] Its complexity is reflected in the length of patent trials. Patent cases make up about one-half of one percent (.57%) of all civil cases in the federal courts, but they make up over 9.4 percent that require a trial of 20 days or more.[5]

Second, the stakes are often so high that the legal fees do not seem high *in comparison*; so companies put the legal pedal to the metal. This modus operandi is justified insofar as the additional legal costs generate commensurate litigation advantages. (This is not a given since an attorney's effort often exhibits diminishing returns and, like anything, the pareto principle applies—20 percent of the work generates 80 percent of the results.[6]) This approach is unjustified, however, insofar as it reflects the "framing effect"—a cognitive bias by which

people become less price sensitive with regard to relatively small purchases when making relatively large purchases. For example, people are less resistant to buying a fancy car stereo when buying a car because the stereo purchase seems small in comparison to the car purchase. They are more price sensitive when buying only a stereo even though, all other things equal, they have more disposable income (because they did not also buy a car).[7] Accordingly, when a plaintiff is trying to "buy" a $20 million verdict and the defendant is trying to "buy" the opposite, monthly legal bills of $100K don't seem so bad.

Third, attorneys often divorce litigation from their clients' business goals.[8] This afflicts every type of litigation, and may be a matter of professional evolution. In other words, firms that facilitate early settlement make less money and, all other things equal, may eventually be selected out of the financially competitive world of law.[9] Another reason is that lawyers sometimes ignore the cost-benefit analysis. Long ago lawyers created for themselves a crowning but ultimately self-serving virtue—"a lawyer should represent a client zealously."[10] In other words, there shall be no such thing as purposefully mediocre legal representation. No lawyer may sell sub-compact representation; every client must receive luxury car representation (or none at all[11]). This demand for quality, which has been the battle cry of guilds throughout history,[12] encourages some lawyers to adopt an aggressive, absolutist, cost-be-damned approach. For them, every fact must be checked, re-checked and checked again. Every possible argument, legal theory and cause of action must be pressed, and the fact that some have but a slight chance of success is almost irrelevant as long as they have some chance.

Alas, the median legal fees for litigating a patent case through trial are, including indirect costs, at least $2 million per side.[13] We will revisit these costs in more detail in the next installment.

Decision Analysis Primer

Only 6.9 percent of patent suits were tried in the last 20 years and only about 4 percent or so will be tried in the coming years[14]. But 100 percent of those that settle are settled in light of what would likely happen at trial. All bargaining takes place in the shadow of the law. Therefore, determining possible judgments and the chances of obtaining or avoiding them is the best indicator of settlement value. Each party must estimate the outcome and its chances, and value the former in light of the latter. Just as a gambler should understand that a one in four chance of

winning $100 is worth $25, a litigant should understand that a 25 percent chance of winning a $100 million dollar judgment has an "expected value" (i.e., probability-weighted average value) of $25 million—assuming no transaction costs, no discounting (e.g., for the time value of money) and no other possible benefits or costs.

Decision analysis helps determine expected value in complex situations and can account for discounting, less conspicuous benefits and costs, and risk aversion. The essence of decision analysis is to divide and conquer, in order to clarify uncertainties, evaluate risks, grapple with tough tradeoffs and make a series of linked decisions in the right sequence.[15]

As shown in the figure titled "Baby Tree," the numbers in which will be fully explained in the next installment, time flows from left to right in a decision tree. At the root of the tree is a "decision node" (usually square), from which emanates option branches such as "litigate" or "settle." These option branches are typically followed by a series of circular "chance nodes" that signify uncertainties, and from which emanate "event branches" such as "win" versus "lose." Each path through the tree eventually ends with a triangular "terminal node" representing a final outcome or payoff, like a $14 million judgment.

Probabilities are assigned to branches emanating from chance nodes, and are placed below the branch line of the event they represent. The probabilities must sum to 100 percent. They should be assessed as "conditional" probabilities. That is, probabilities should be assigned to particular branches under the assumption that the events and decisions to the left of the branch in question have already occurred.

To calculate or "roll back" a decision tree, one works backward, from right to left. The value of each node is determined as follows:

- The value of a terminal node is equal to the value of its payoff.
- The value of a chance node is equal to its expected value, which is found by (a) taking the value of the node located immediately to the right of each event branch emanating from the chance node, (b) multiplying each node value by its event branch's probability and then (c) adding the products together. (With respect to the figure, $12 million multiplied by a 0.58 probability equals $6.96 million, and $2.0 million multiplied by a 0.42 probability equals $0.84 million. The sum of these products, $6.1 million, equals the value of the chance node.)

- The value of a decision node is equal to the value of its best option. Thus, if a plaintiff's two options are "litigate" and "settle," and if the expected value of litigating is $14 million and the value of settling is $0.50 million, then the value of the decision node is $14 million.[16]

In sum, the first goal is to build a tree that visually depicts (1) the major choices, (2) the events that could follow, (3) the probabilities of those events occurring, and (4) the consequences if they do.

Of course, these are the bare bones of basic *tree* analysis. A full exploration of the field of decision analysis is far beyond the scope of this series. However, the next installment will comprise a sampler of common decision analysis issues, tools and techniques. Then we will pose a hypothetical suit and climb into the decision trees.

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[1] Jean O. Lanjouw and Mark Schankerman, Stylized Facts of Patent Litigation: value, scope and ownership, pg. 3, NBER Working Paper No. 6297 (NBER 1997);

[2] It's become so expensive that even some beneficiaries of the expense, the patent and trial attorneys, are calling for change. For example, every year the American Intellectual Property Law Association, whose membership comprises about 5000 IP attorneys, hosts a symposium on reducing the costs of patent litigation. See also Tom Arnold, 'Why ADR,' in *Patent Litigation 1999* (Practising Law Institute 1999); James L Ewing IV, 'Patent Litigation Management and Alternative Billing,' in Patent Litigation 1999, p. 1057-1070 (Practising Law Institute 1999); see also Lucy J. Billings, Managing Patent Litigation, in *Patent Litigation 1999*, p. 1047-1054 (Practising Law Institute 1999). It's also hard to estimate the expense. About 50 percent of the time, the costs will exceed their estimate by more than $500K or go under the estimate by more than $250K. Similarly, in about one half of cases, the length of suit will exceed the estimated length by more than two years or go under it by more than one year. Tom Arnold, supra at 1017.

[3] Derived from: Mark Lemley, Rational Ignorance at the Patent Office, pg. 10, Working Paper No. 2000-16 (U.C. Berkely Law and Economics Working Paper Series 2000). I'm trying to use conservative but forward-looking numbers. Lemley comes up with $2.1 billion using legal costs from 1999 and the number of suits filed in either 1992 or 1996 depending on whether one relies on the Derwent Litalert database or the Administrative Office of the U.S. District Courts.

[4] "Understanding patent law is a tricky business. The history of American patent law has been relatively chaotic compared to other laws providing for exclusive rights to property. Major changes in patent law occur on a yearly and

sometimes monthly basis. The frequent changes in patent law are a symptom of the confusion that surrounds it. The difficulty does not arise because the general goal of the law is unclear or hard to understand… The difficulty comes in understanding exactly how the patent system helps the economy and how particular rules contribute to that goal." John Schlicher, John W. Schlicher, *Patent Law: Legal and Economic Principles*, pp. viii-ix of preface (West 1992, updated annually).

[5] Kimberly A. Moore, Forum Shopping in Patent Cases: Does Geographic Choice Affect Innovation? 79 *N.C. L. Rev.* (2001); --Forum Shopping in Patent Cases: Does Geographic Choice Affect Innovation? 83 *JPTOS* (No. 8, August 2001).

[6] James L Ewing IV, 'Patent Litigation Management and Alternative Billing,' in *Patent Litigation 1999*, p. 1062 (Practising Law Institute 1999).

[7] Amos Tversky and Daniel Kahneman, The Psychology of Preferences, *Scientifica America* 132-242 (1982); Goodwin and Wright, supra at 65-72.

[8] Lucy J. Billings, Managing Patent Litigation, in *Patent Litigation 1999*, p. 1047-1054, 1052 (Practising Law Institute 1999). Billings appears to agree with this statement.

[9] See generally Samson Vermont, Memes and the Evolution of Intellectual Dishonesty in Law, 22 *Legal Studies Forum* 655 (1998).

[10] Canon 7, ABA Model Code of Professional Responsibility.

[11] The pro bono ethic is a quasi-recognition of this problem. It's "quasi" in that it reflects an unrealistic and overly tidy view that if the pie is just sliced and diced the right way everyone can have everything: attorneys can be perfectionists and those who can't afford perfectionists will get them nonetheless. But pro bono work is often too paltry to have this effect. To some extent, it's a token gesture which sustains the illusion of highmindedness without making any serious dent in the pocketbook. (This is not to say that lawyers who perform pro bono work think this way.) See generally Vermont, Memes, supra.

[12] See Richard A. Posner, *Overcoming Law* 33-67 (Harvard Univ. Press 1995).

[13] See 2001 AIPLA Economic Survey plus next month's discussion. Note that direct fees and related expenses increased 30 percent from 1997 to 1999, and the last two years have seen more dramatic increases in associate salaries. (Law firm partners are eating some of this salary increase, but some will come out of increased hourly rates. See also AIPLA 1999 Survey, at pg. 86—the table is vague but appears to show billings increasing about 25 percent per year.) Also, patent suits are increasing about eight percent every year, whereas the number of judges and patent trials will remain fixed. See generally Trends in Patent Infringement Lawsuits 1990-1999, Navigant Consulting Inc. (2000) (available from Dr. William O. Kerr, Washington DC); William O. Kerr and Gauri Prakash-Canjels, Some Evidence of the Influence of Patent Law on Innovation and Technology, pp.2-3 (Penta Advisory Services 2000); Eugene R. Quinn, Jr., Using Alternative Dispute Resolution to Resolve Patent Litigation: A Survey of Patent Litigators, 3 *Marquette Intell. Prop. L. Rev.* 77 (1999). This will increase the length of suits, which invariably increases fees. Work expands to fill the time allotted for it. Cyril N. Parkinson, *Parkinson's Law* (1957). If you have two weeks to complete a task, you'll tend to complete it in two weeks. If you have two days to complete the same task, you'll tend to complete it in two days. Therefore, since attorneys generally charge for their time and not by the task or according to value added, increasing the time interval in which they work invariably increases costs. This is especially true in litigation which, when protracted and open-ended, drinks attorney billables with abandon. And few forms of litigation are thirstier than patent litigation.

[14] By looking at Quinn, supra, one can see that the number of patent trials is likely to stay constant at about 100 per year. In 2000, 2486 patent suits were filed. One-hundred is four percent of 2486.

[15] John S. Hammond, Ralph L. Keeney and Howard Raiffa, *Smart Choices: A Practical Guide to Making Better Decisions* p. viii-ix (Harvard Business School Press 1999).

[16] See generally Marc B. Victor, *Getting Started with DATA 3.5—for Litigators* 9-12 (TreeAge Software Inc. 1999); Paul Goodwin and George Wright, *Decision Analysis for Management Judgment* 2nd ed., pp. 19-22, 145-179 (John Wiley & Sons Inc., 1998).