The Decision to Settle Litigation Based on the Effects of a Judgment on the Patent Owner and the Accused Infringer

A. Basic Model of Settlement Decisions

If a patent infringement action is litigated and the patent owner wins, the owner obtains a judgment ordering the infringer to pay damages and, in most cases, cease infringing. If the parties settle, the terms of settlement define the benefits the patent owner receives and costs the accused infringer bears. For the sake of brevity, a potential infringer or an accused infringer will be identified simply as an “infringer.” This term should not be understood to mean that there is no dispute or that there has been a decision.

Patent litigation usually involves uncertainty. A well-informed party rarely will believe that its probability of winning or losing a patent action is close to 100 percent or 0 percent. In other words, a party rarely will believe that, if it litigated the same action to judgment 10 times, it would win all 10 or lose all 10. The likelihood of winning or losing will be somewhere between those extremes. Uncertainty affects settlement in two ways. One is that a party will decide whether to settle by comparing the

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1. This book is directed primarily to patent infringement actions. Patent owners often commence an infringement action and also complain to the United States International Tarde Commission (ITC) that infringing importation of products into the United States is an act of unfair competition under section 337 of the Tariff Act of 1930. If the ITC initiates an enforcement proceeding, the patent owner and infringer may use the same general approach to evaluate settlement of the ITC action with its different remedies.
value or cost of settlement to the expected value or expected cost of litigation to judgment, not the actual value and actual cost. A patent owner will discount the value of litigation based on its estimate of the likelihood or probability that it will win. An infringer will discount the cost of litigation based on its estimate of the likelihood or probability that it will lose.

Assume initially that the infringer’s perception of what it pays under a settlement is the same as the patent owner’s perception of the value it obtains. A patent owner will settle only if the value it receives under the settlement, S, exceeds its expected value of litigating the action to judgment, EVlit,owner. An infringer will settle only if the cost of settlement, also S, is less than its expected cost of the judgment in the action, EClit,inf.

The basic condition for settlement is:

\[ EV_{lit,owner} < S < EClit,inf, \]

where:

- \( EV_{lit,owner} \) is the patent owner’s expected value of litigating the action to judgment; and
- \( EClit,inf \) is the infringer’s expected cost of the judgment.

The parties are likely to litigate if the patent owner’s expected value of litigation exceeds the infringer’s expected cost of litigation. The parties are likely to settle if the infringer’s expected cost of litigation exceeds the patent owner’s expected value of litigation. If the infringer’s expected cost of litigation exceeds the patent owner’s expected value, the difference defines a range of amounts, S, within which settlement is possible, as illustrated below.

\[ EV_{lit,owner} < \text{Settlement Range} < EClit,inf \]

\[ \$0 \]  \hline

2. People making decisions about actions involving uncertainty generally are assumed to choose the most desirable action in this way. The device for evaluating a person’s most likely decision often is called the Expected Utility Rule and has been formulated and used since at least the 1950s. See e.g., Jack Hirshleifer & John G. Riley, THE ANALYTICS OF UNCERTAINTY AND INFORMATION Ch. 1 (Cambridge University Press 1992).

B. Expected Value and Cost of Litigation

At first approximation, the patent owner’s expected value of an action, \( EV_{\text{lit},\text{owner}} \), is the owner’s estimate of the probability it will win, \( P_{\text{w,owner}} \), times the value of winning, \( V_{\text{w,owner}} \). The expected cost of an action to an infringer, \( EC_{\text{lit},\text{inf}} \), is the infringer’s estimate of the probability it will lose, \( P_{\text{l,inf}} \), times the cost of losing, \( C_{\text{l,inf}} \). Settlement is likely only if:

\[
(2) \quad P_{\text{w,owner}} \times V_{\text{w,owner}} < S < P_{\text{l,inf}} \times C_{\text{l,inf}},
\]

where:

- \( P_{\text{w,owner}} \) is the owner’s estimate of the probability it will win;
- \( V_{\text{w,owner}} \) is the owner’s estimate of the value of winning;
- \( P_{\text{l,inf}} \) is the infringer’s estimate of the probability it will lose; and
- \( C_{\text{l,inf}} \) is the infringer’s estimate of the cost if it loses.

The patent owner’s expected value of winning one action, \( V_{\text{w,owner}} \), is the sum of the value of an injunction against this infringer, \( V_{\text{inj}} \), plus the value of damages, \( V_{\text{dam}} \). The infringer’s expected cost of losing an action, \( C_{\text{l,inf}} \), is the cost of an injunction, \( C_{\text{inj}} \), plus the cost of damages, \( C_{\text{dam}} \). Therefore, an action is likely to be settled if:

\[
(3) \quad P_{\text{w,owner}} \times (V_{\text{inj}} + V_{\text{dam}}) < S < P_{\text{l,inf}} \times (C_{\text{inj}} + C_{\text{dam}}),
\]

where:

- \( V_{\text{inj}} \) is the owner’s estimate of the value of an injunction against the infringer;
- \( V_{\text{dam}} \) is the owner’s estimate of the value of damages;
- \( C_{\text{inj}} \) is the infringer’s estimate of the cost of an injunction; and
- \( C_{\text{dam}} \) is the infringer’s estimate of the cost of damages.

C. Impact of Litigation Costs

Each party will incur costs to litigate the action if there is no settlement, \( LC \). The costs of patent litigation include the costs of related activities, such as requests for reexamination. Litigation costs are payments to attorneys, experts, consultants, graphic designers, investigators, and others who provide services to support litigation. There are other types of costs a company bears when engaged in litigation. These other costs may exceed the direct costs of attorneys and litigation expenses. Other costs of patent litigation are: (1) the lost time of company employees devoted to litigation instead of more productive activities; (2) the risk that a party’s technical or business information not known to the other party may be revealed and, contrary to protective orders, used by the other party in some adverse manner; and (3) the risk an infringement defendant’s customers may stop or reduce purchases due to the mere existence of the litigation and the threat it poses to the defendant’s continued ability to supply or to a customer’s perception of its potential infringement liability as a product user.

Each party devotes time and money to litigation that it could have used in other ways. For settlement purposes, each party should regard its litigation costs as the direct
costs, plus the returns on alternative investments involving similar risk that a party could have earned with the money invested in litigation, plus the returns on alternative activities a party could have earned by devoting time spent on litigation to more productive activities. The opportunity cost of the money and time invested in litigation may exceed the direct costs of litigating.

If each party bears its litigation costs, those costs reduce the value of litigation to the patent owner and increase its cost to the infringer. The necessary condition for settlement becomes:

\[
EV_{lit, owner} - LC_{owner} < S < EClit, inf + LC_{inf},
\]

or equivalently,

\[
Pw, owner \times (Vinj + Vdam) - LC_{owner} < S < Pl, inf \times (Cinj + Cdam) + LC_{inf},
\]

where:

- \(LC_{owner}\) is the patent owner’s costs to litigate the action; and
- \(LC_{inf}\) is the infringer’s costs to litigate the action.

If the infringer’s expected cost of litigation is the same as the patent owner’s expected value before considering litigation costs, settlement is not possible. When litigation costs are considered, there may be a range of amounts, \(S\), within which settlement is possible.

\[
EV_{lit, owner} = EClit, inf
\]

\[
\begin{align*}
\text{Settlement Range} & \approx S \text{ to } LC_{inf} + LC_{owner} \\
\text{Settlement Range} & \approx S \text{ to } LC_{inf} + LC_{owner} \\
\end{align*}
\]

D. Impact of Transaction Costs

The negotiation and entry of a settlement agreement and related papers involves time and expense for the parties. I have not included those transaction costs in the general model or in further discussion because I would expect them to be modest in relation to the absolute values of the other factors. However, if those transaction costs are likely to be significant relative to future litigation costs (such as settlement after trial and before appeal), it is appropriate to treat the value of settlement, \(S\), to the patent owner as \(S\) minus the owner’s transaction costs of settling, \(SC_{owner}\), and the cost of settlement to the infringer as \(S\) plus the infringer’s transaction costs of settling, \(SC_{inf}\). With significant settlement transaction costs, the necessary conditions for settlement become:

\[
(5a) \quad Pw, owner \times (Vinj + Vdam) - LC_{owner} < S - SC_{owner},
\]

and

\[
S + SC_{inf} < Pl, inf \times (Cinj + Cdam) + LC_{inf}.
\]
where:

\[ SC_{\text{owner}} \] is the patent owner’s transaction costs to settle the action; and
\[ SC_{\text{inf}} \] is the infringer’s transaction costs to settle the action.

An equivalent formulation of this condition is:

\[ (5a) \quad P_{w,\text{owner}} \times (V_{\text{inj}} + V_{\text{dam}}) - L_{\text{Cowner}} + SC_{\text{owner}} < S < P_{\text{l,inf}} \times (C_{\text{inj}} + C_{\text{dam}}) + L_{\text{Cinf}} - SC_{\text{inf}}. \]

E. Simple Example

Figure 2.1 is an example of a market in which a patent owner and an infringer are the only sellers, are equally efficient, and sell exactly the same product at the price that maximizes collective profits—the one situation where patent law on injunctions and damages leads to a relatively predictable and sensible result.

Assume a patent owner and an infringer each sell a product consumers regard as equally valuable. The curve D shows the annual demand for that product—the quantity consumers would buy at the prices shown on the vertical axis. If the patent is as broad as...
the patent owner asserts, the infringer could sell nothing to those customers without using
the invention. The average total cost per unit of producing and selling, AC, for the patent
owner and the infringer is the same, $15 per unit. If there were no infringement, and the
patent owner sold at a single price to all consumers, the additional or “marginal revenue”
the patent owner would earn by selling an additional unit is shown as MR. Marginal rev-
erne is less than average revenue because selling additional units requires a price reduc-
tion and this lower price applies to the units that could have been sold at a higher price.
If there were no infringemen, the patent owner would produce at the most profitable
quantity, 376,000 units, and sell at $27.50 per unit. This is the quantity at which the cost
of producing and selling one additional unit, $15, equals the marginal revenue from that
sale, also $15. The infringer also sells at $27.50 per unit. Each captures half the custom-
ers. Each sells 188,000 units. If the patent owner made the sales lost to the infringer, the
patent owner could produce the additional 188,000 units at $12.50 per unit.

Suppose the patent owner commences an action after the infringer has been selling
for five years. The patent owner and infringer discuss settlement immediately after a
complaint is filed. Each believes it would take five years to finally litigate the action.
After those five years, the patent would have five years to expiration. Assume each is
able to litigate to judgment at no cost. Each is able to negotiate settlement without cost.
The patent owner believes it has an 80% chance of winning and that, if it wins, it will
be awarded lost-profits damages and an injunction. The infringer believes the patent
owner has only a 60% chance of winning and that lost-profits damages and an injunc-
tion will follow if the patent owner wins.

Will this action be settled? Ignoring prejudgment interest, this is the situation (num-bers are thousands of dollars). For purposes of this example, I have treated the value
of an injunction to the patent owner and its cost to the infringer over the remainingive years of the patent as the net profits gained or lost with costs including fixed costs
($11,750). Damages for the five-year periods before litigation and during litigation
($14,100 each) are larger because they are based on patent owner incremental costs.

\[
(5) \quad P_{\text{owner}} \times (\text{Vinj} + \text{Vdam}) - LC_{\text{owner}} < S < P_{\text{inf}} \times (\text{Cinj} + \text{Cdam}) + LC_{\text{inf}}
\]

\[
.80 \times ($11,750 + $28,200) - 0 < S < .60 \times ($11,750 + $28,200) + 0
\]

\[
$31,960 < S < $23,970
\]

Settlement is unlikely because the patent owner believes there is a greater chance it
will win (80%) than the infringer believes it will lose (60%). The gap preventing
settlement is $7,989. With no litigation costs, settlement will occur only if the infringer
believes it has a greater chance of losing (such as 80%) than the patent owner thinks it
has of winning (such as 60%).

Another way to assess settlement prospects is to look at each party’s expected value
and cost of litigation given the patent owner’s possible views on the probability it would
win and the infringer’s possible views on the probability it would lose. Chart 2.1 shows
for each probability of winning the patent owner’s corresponding expected value of
litigation on the bottom axis and the infringer’s expected cost of litigation along the top.
The patent owner’s expected value of litigation and the infringer’s expected cost are straight lines. These lines are identical because each views the value and cost of litigation to be the same.

Suppose instead that each party expects litigation costs of $4,000 (numbers are again in the thousands of dollars). Ignoring prejudgment interest, these are the prospects for settlement:

\[
(5) \quad P_{\text{owner}} \times (V_{\text{inj}} + V_{\text{dam}}) - L_{\text{owner}} < S < P_{\text{inf}} \times (C_{\text{inj}} + C_{\text{dam}}) + L_{\text{inf}}
\]

\[
.80 \times ($11,750 + $28,200) - $4,000 < S < .60 \times ($11,750 + $28,200) + $4,000
\]

\[
$27,960 < S < $27,970
\]

Chart 2.1
Expected Value and Cost of Litigation
Settlement is now possible, although the settlement range is razor thin. Combined litigation costs of $8 million converted an action that would not be settled into one that might. This example is not unusual. In litigated actions during the period from 2000 to 2007, the average (or mean) award was $26 million, and the median award was $3 million.\(^4\) In this example, damages were $28 million. Even though the patent owner believed it had a very high probability of winning, and the infringer also thought the patent owner was likely to win, settlement would make sense if the parties jointly expected litigation costs somewhat larger than $8 million.

With $4 million in litigation costs for each party, Chart 2.2 shows the patent owner’s expected value of litigation (and minimum settlement amount) and the infringer’s expected cost of litigation (and maximum settlement amount) for each probability of winning (for the patent owner) and losing (for the infringer).

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For each patent owner estimate of its probability of winning, the patent owner will settle for any amount larger than the corresponding point on its expected value line. These amounts are shown on the bottom axis. If the patent owner believed it would survive summary judgment and had a 60% chance of winning at trial, the owner would settle for any amount greater than $19,970. Notice that the action has positive value for the patent owner only if it believes it has better than a 10% chance of winning. For each infringer’s estimate of its probability of losing, the infringer will settle for any amount less than the corresponding point on its expected cost line. These amounts are shown on the top axis. The patent owner and infringer amounts are aligned only approximately. If the infringer believed it would not win on summary judgment and had a 60% chance of losing at trial, the infringer would settle for any amount less than $27,970. The combined litigation costs of $8 million make settlement advantageous.

F. Important Aspects of the Basic Model of Settlement in Patent Actions

1. **Differences in Probability Estimates Are Highly Likely**

Ignoring litigation costs and factors introduced later (mainly risk and third-party effects), an action will be litigated rather than settled only where the parties have significant differences in their estimates of the probabilities of winning and losing, or the value of winning and cost of losing.¹ A patent owner and an infringer commonly have different and honestly held views of the probability of winning and losing. This is why a great deal of time in settlement negotiations is devoted to each party’s views of its probability of winning or losing, and only some time to each party’s views on the value and cost of remedies.

The parties’ perceptions of the overall probability of winning and losing reflect their expectations about the probabilities that they will win or lose on particular issues in an action. There are many potential decisive issues that may be litigated in an infringement action. In order for judgment to be entered for a patent owner, the court or jury must find the patent valid (or as some courts say, “not invalid”), infringed, and, if other defenses are raised, no defense exists. There are about eight commonly litigated reasons why a patent may be invalid. Infringement depends on what activities an infringer carried out and whether the products and processes involved employed the patented invention. Whether a product or process employed the patented invention requires consideration of four separate issues. There are several defenses to infringement, including patent misuse, fraud during prosecution, inequitable conduct during prosecution, estoppel, license, implied license, and exhaustion.

The large number of potential issues poses a problem for settlement. Each party’s estimate of the ultimate probability of winning or losing depends on its views on which issues will be important. If the parties disagree on what issues ultimately are important, they are highly likely to disagree on the overall chance of winning and losing. This means that probability estimates are likely to diverge until the parties have identified a common set of dispositive issues to be litigated.

¹. When risk and third-party effects are considered, this will change. See Chapter 2 § G., Chapter 4, and Chapter 5.