Introduction to Law and Economics: Settlement and Litigation

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Introduction

- Since the result of civil dispute is always monetary transfer with no surplus created, and since litigation is costly, it is always better to settle than to litigate.
- Why then there are still litigations?
- Two theories:
  1. Divergent expectation theory: Plaintiff has different expectation of trial outcome to the defendant.
  2. Strategic theory: Both sides act strategically when they face uncertainty of outcomes.

Some Notations

- A plaintiff (P) and a defendant (D), disputing over the compensation (X) of a harm the latter inflicts on the former.
- S: The amount of compensation that either P or D proposes to settle out-of-court.
- X_p and X_d: The amount of compensation that P and D expects to be awarded in court, respectively.

Some Notations

- P_p and P_d: The probability that P and D believes that P will prevails (wins) in court, respectively.
- C_p and C_d: The cost of litigation in court for P and D, respectively.
- k_p and k_d: The cost of settle out-of-court for P and D, respectively. (Usually assumed to be 0.)

Divergent Expectation Model

- The reason why there is litigation is because of the difference in P's and D's expectations of court outcome.
- Essentially, because both are more optimistic than the other side.

Divergent Expectation Model

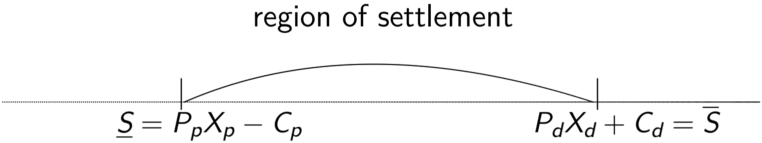
- The expected gain of going to court for

$$P : P_p X_p - C_p, \text{ and}$$
$$D : -P_d X_d - C_d.$$

- Therefore, $P_p X_p - C_p \equiv \underline{S}$ is the minimum that P will accept to settle.
- Similarly, $P_d X_d + C_d \equiv \bar{S}$ is the maximum that D is willing to pay as settlement.
- Here I am assuming $k_p = k_d = 0$.

Divergent Expectation Model

- The region between $\bar{S}$ and $\underline{S}$ is called region of settlement.
- Divergent Expectation Theory: There is settlement if, and only if, the region of settlement is non-empty, i.e., $\bar{S} \geq \underline{S}$.



Divergent Expectation Model

- In more details, this means $P_d X_d + C_d \geq P_p X_p - C_p$.
- Or, more clearly,

$$C_d + C_p \equiv C_t \geq P_p X_p - P_d X_d. \tag{1}$$

- C_t is the total litigation cost.
- In other words, there is settlement *iff* P's expected court judgement is greater than D's expected court loss by no more than total litigation cost.

Divergent Expectation Model

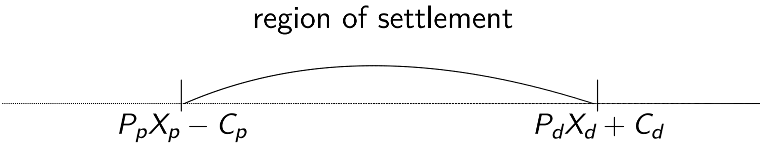
- To see it even clearer, assume that $X_p = X_d = X$, then (1) reduces to

$$(P_p - P_d)X \leq C_t.$$

- There is litigation if, and only if, the plaintiff is sufficiently optimistic of winning than the defendant.
- If $P_d = P_p$, the case will settle for sure.
- Litigation arises solely because of divergence in beliefs. If there is no difference in belief, case will surely settle.

Divergent Expectation Model

- Effects of P, X, and C on settlement:



- Cost encourage settlement.
- Optimistic belief and expected gain discourage settlement.

Divergent Expectation Model

- If plaintiff is risk averse, his minimum willingness to settle, $\underline{S}$, will decrease.
- If defendant is risk averse, his maximum willingness to settle, $\overline{S}$, will increase.
- Risk consideration therefore increases the possibility of settlement.

An Example of Risk-Averse Litigants

- Let $X_p = 1,027$, $X_d = 1,000$, $P_p = 0.8$, $P_d = 0.6$, $C_d = 20$, and $C_p = 27$.
- If both P and D are risk neutral, $\underline{S} = 0.8 \times 1,027 - 27 = 794.6$, $\overline{S} = 0.6 \times 1,000 + 20 = 620$.
- Since $\underline{S} > \overline{S}$, there can be no settlement.

An Example of Risk-Averse Litigants

- Now suppose P is risk-averse, with utility function $\sqrt[3]{y}$, where y is wealth.
- In this case $\underline{S}$ must now satisfy
  $0.8\sqrt[3]{1027-27}+0.2\sqrt[3]{-27}=\sqrt[3]{\underline{S}}$.
  That is, $0.8\times 10-0.2*3=\sqrt[3]{\underline{S}}$, so that $\underline{S}=405.224$.
- Since $\underline{S}<\overline{S}=620$, now there is settlement. The settlement amount can lie anywhere between 620 and 405.224.

Divergent Expectation Model (Discussion)

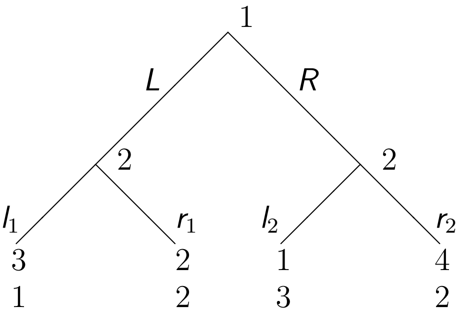
- Requires mistakes on either party.
- Expectation hard to capture.
- Litigation is results of errors.

Private Informational (Strategic) Model

- Litigation is result of strategic behavior.
- More sophisticated.
- Game-theoretic in nature.

Private Informational (Strategic) Model

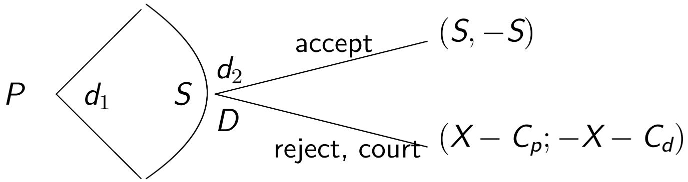
- Some game theory: Subgame perfect equilibrium (SPE).



- Equilibrium result, in this example (L, r_1), has nothing to do with efficiency: It is all about strategic motivation.

Private Informational (Strategic) Model

- A litigation game:



- *SPE*:
  1. At d_2, injurer accepts *iff* $S \leq X + C_d$.
  2. At d_1, $S = \max\{X - C_p; \max\{y | y \leq X + C_d\}\}$.
- Therefore, $S^* = X + C_d$, and defendant accepts.

Private Informational (Strategic) Model

- Example: An accident occurs which causes the victim (V; or plaintiff, P) a loss of X=100,000. Litigation costs for both victim and injurer (I; or defendant, D) are $C_d = C_p =$ 10,000.
- *SPE* is $P^* = 110,000$ and injurer accepts.
- There is no litigation.
- In fact, there can be no litigation under perfect information. (This is some version of Coase Theorem).
- Court trial occurs only when certain underlying assumptions for Coase Theorem is violated. Here we take imperfect (or asymmetric) information.

Private Informational (Strategic) Model

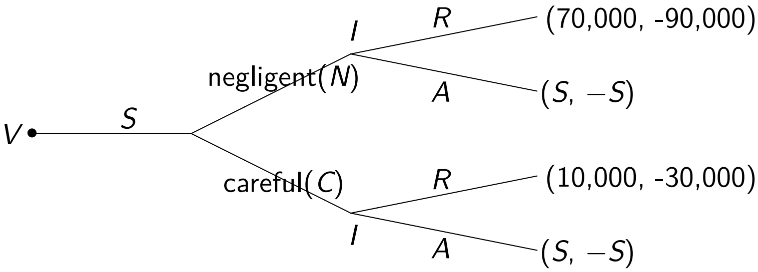
- Suppose the probability that injurer will be found liable is p.
- If litigated, victim expects to receive $100,000p - 10,000$, while injurer expects to lose $100,000p + 10,000$. For any p, there is a range for settlement. But why sometimes no settlement in reality?
- DE model explanation: $p_I \neq p$ or/and $p_v \neq p$, and $p_v > p_I$.
- If $100,000p_v - 10,000 > 100,000p_I + 10,000$ (i.e., $p_v - p_I > 1/5$), then there exists no settlement range.

Private Informational (Strategic) Model

- Private information model: One party might know more about the value of p than the other.
- Suppose injurer is either negligent (i.e., responsible for damage) or careful (i.e., not responsible). Since the court might not be fully accurate, suppose former is expected to prevail in court with probability 0.2, and the latter 0.8.
- Only injurer himself knows whether he is negligent.
- Victim believes that injurer is equally likely to be either.

Private Informational (Strategic) Model

- V makes take-it-or-leave-it offer S. If S is rejected, then go to court.



- In the graph, $70,000 = 100,000 \times 0.8 - 10,000$; $-90,000 = -100,000 \times 0.8 - 10,000$; *etc.*

Private Informational (Strategic) Model

- SPE:
  - N-injurer: accept S iff $S \leq 90,000$.
  - C-injurer: accept S iff $S \leq 30,000$.
  - $S^* = 90,000$.
- Expected payoff:
  - N-injurer: -90,000.
  - C-injurer: -30,000.
  - $V = 50,000$.
- N-injurer settles and C-injurer litigates.
- There is a $1/2$ chance of going to court.

Private Informational (Strategic) Model

- There is positive probability for either settlement or litigation.
- There is no "error": Both P and D fully anticipate possible outcomes. They can't reach the more efficient outcome (i.e., settlement) because of they possess different information. Going to court is a "gamble" both parties feel worthy of.

Private Informational (Strategic) Model

- In a more complicated situation, what if X is only known to injurer, and, e.g., $X \in UNI[0, 2, 000]$?
- Example: $X = I \cdot d$; where $d = 1,000$ is damage, and $I \in UNI[0, 2]$ is liability, which is injurer's private information.
- C_p=200, C_d=400.

Private Informational (Strategic) Model

- Suppose victim's settlement offer is S.
- Then injurer accepts S if $S \leq X + C_d$, i.e., if $S - C_d \leq X$; and rejects S if $S - C_d > X$.
- If S is accepted, victim's gain is S.

  If S is rejected, victim's gain is the expected value of $X - C_p$ in court.

Private Informational (Strategic) Model

- The total expected gain in offering S is then

$$\begin{aligned} & E(S|S - C_d \leq X) + E(X - C_p|S - C_d > X) \\ & = (1 - \frac{S - C_d}{2000})S + \frac{S - C_d}{2000}(E(X) - C_p) \end{aligned}$$

- $S^* = 1600$.
- A probability of $\frac{1600-400}{2000} = \frac{3}{5}$ of settlement, and a probability of $1 - \frac{3}{5} = \frac{2}{5}$ of litigation.
- Litigation is a result of strategic behavior.
- Plaintiff, fully aware that S^* might be rejected, "gambles" against possible values of liability.

Private Informational (Strategic) Model

- What if British rule is used?
- I's payoff is -120,000 if wins, and 0 if lose.
- V's payoff is 100,000 if wins, and -20,000 if lose.
- What if V or I are risk-averse? More favorable to proposer.