Legal Systems Comparison: Firms’ Strategies in Patent Litigation

Danmo Lin, Du Liu and A. Elizabeth Whalley
Finance Group, Warwick Business School, University of Warwick

Research questions

- How do firms' strategies in patent litigation differ under the English rule ('loser pays') compared to the American rule ('each party pays')?
- Strategies we investigate include: settling with a license agreement before an infringement lawsuit is filed ('ex ante settlement'), filing an infringement lawsuit, threatening to litigate to force out the alleged infringer, setting during litigation ('ex post settlement'), unilaterally leaving the lawsuit.

Main contributions

- Take a first step towards understanding how legal systems affect corporate innovation (Examples of empirical work on this topic include Caskurlu, 2019 and Mezzanotti, 2020).
- Provide theory evidence that a legal system affects the strength of competitive advantage resulting from financial constraints.

Model setup

- Two firms competing in product markets:
  - Incumbent ('I') - patent owner, Challenger ('C') - allegedly infringed.
  - Each firm's operating profit is linear to market demand, i.e., \( p_0 x_a \), where \( x_a \) is the GBM (\( d y + \mu_0(\text{profit} + \sigma_0(\text{returns})) \), and no other revenues.
  - \( p_0 = 1 \) monopoly, \( p_0 > 1 \) duopoly.

- Once litigation starts, the judgement - Position (\( x \)). Both firms incur ongoing cost in litigation.
  - Common knowledge that Pro\((W|x)\) = 1.

- Firms follow threshold strategies (threshold on \( x \)) regarding:
  - ex-ante settlement vs. litigate vs. do nothing
  - ex-post settlement vs. leaving the lawsuit unilaterally to save litigation cost (either \( C \) exits or I withdraws) vs. waiting for judgement

- Comparison of the US vs UK legal system - focus on cost allocation
  - American rule: each party pays for its own legal costs
  - English rule: the losing party bears all legal costs

Game tree

Implications of the English rule

Compared to the American rule, the English rule ('loser pays', interchangeable with the UK rule) has two implications:

1. If C wins, I (C’s infringer cost) C; if I wins, no transfer due to C’s financial constraint. \( \Rightarrow \) The English rule makes litigation more expensive for I.
2. If C wins, I may liquidate b/c of its own financial constraints, if so, C becomes the new monopolist. \( \Rightarrow \) Licensing the lawsuit becomes more detrimental to I under the English rule. 2 possibilities with English rule:
   - Case 1: "I remain a going-concern" (always true under American rule)
   - Case 2: "I may liquidate" (only relevant under English rule)

Remark: both implications suggest that the English rule favours against C when firms' financial constraints are taken into consideration.

Finding: Royalty rate in ex-post settlement

- The form of settlement: \( C \) pays, \( I \) a fixed amount of \( \Theta_C|W|y \).

- Royalty rate: \( \Theta_C = p(r - p)(1 - \frac{1}{r}) + \frac{p(r - p)}{1 + \frac{1}{r}} - \frac{1}{1 + \frac{1}{r}} \)

Result: Ceteris paribus, the royalty rate in an ex-post settlement is higher under the American rule than under the English rule (i.e., \( \Theta_C^{UK} < \Theta_C^{US} \)).

Finding: settlement likelihood w.r.t. \( p \)

Result: The effects of the probability of I winning (\( p \)) on settlement likelihood are opposite in the two legal systems: it increases/decreases the settlement likelihood under the American/English rule.

Intuition for the result

Under both rules: \( p \mapsto \) Area(settlement offer rejected by C) \( \Rightarrow \) Area(I refuses to offer settlement)). Because \( I \)’s withdrawal area is larger under English rule than under American rule, therefore as \( p \mapsto \)
- English rule: C’s rejection matters more for no-settlement \( \Rightarrow \) settlement likelihood \( \uparrow \)
- American rule: I’s refusal matters more for no-settlement \( \Rightarrow \) settlement likelihood \( \downarrow \).

Finding: settlement likelihood w.r.t. \( \sigma \)

Result: Product market volatility \( \sigma \) reduces settlement likelihood. The effect of \( \sigma \) is more significant under the English rule than under the American rule.

Testable implications

1. Litigation rates
   - The litigation rate is higher/lower under the English rule than the American rule if the infringing products are substitutes/complements to I’s.
2. Settlement rates
   - Under the American rule, policies which increase the winning probability of the plaintiff in a patent infringement lawsuit reduce settlement likelihood. It is opposite under the English rule.
3. Settlement terms
   - Everything else equal, the royalty rate in an ex-post settlement is lower under the American rule than under the American rule.

References