Why do Inventors Sell to Patent Trolls? Experimental Evidence for the Asymmetry Hypothesis

Stephen Haber and Seth Werfel
Stanford University

Question

- Lots of debate about whether “patent trolls” are good or bad, usually based on the number of lawsuits involving trolls.
- The empirical literature sidesteps a more fundamental question:

Why do inventors sell to trolls (PAEs) in the first place?

Our Answer

- Transactions require willing buyers and sellers
- Asymmetry between inventors and large manufacturers prevents credible threat to litigate after infringement
  - Upfront costs
  - Potential for net loss
- PAEs offer insurance and liquidity

Thought Experiment

If the demand for PAEs is due to financial constraints…

…then what would happen if those constraints were relaxed?

Actual Experiment

- From the perspective of inventors, contingent fees provide similar benefits to PAEs
  - No upfront costs
  - Eliminate losses

If inventors sell to PAEs due to constraints, then they should be less likely to sell to PAE when contingent fee is the alternative.

Note on Experiments

- Strong causal inference
- But always questions about external validity

  Hence:

  - Our sample is from actual inventors and entrepreneurs affiliated with incubators and accelerators at Stanford and UC Berkeley
  - We present hypothetical scenarios that mimic reality

Our Sample

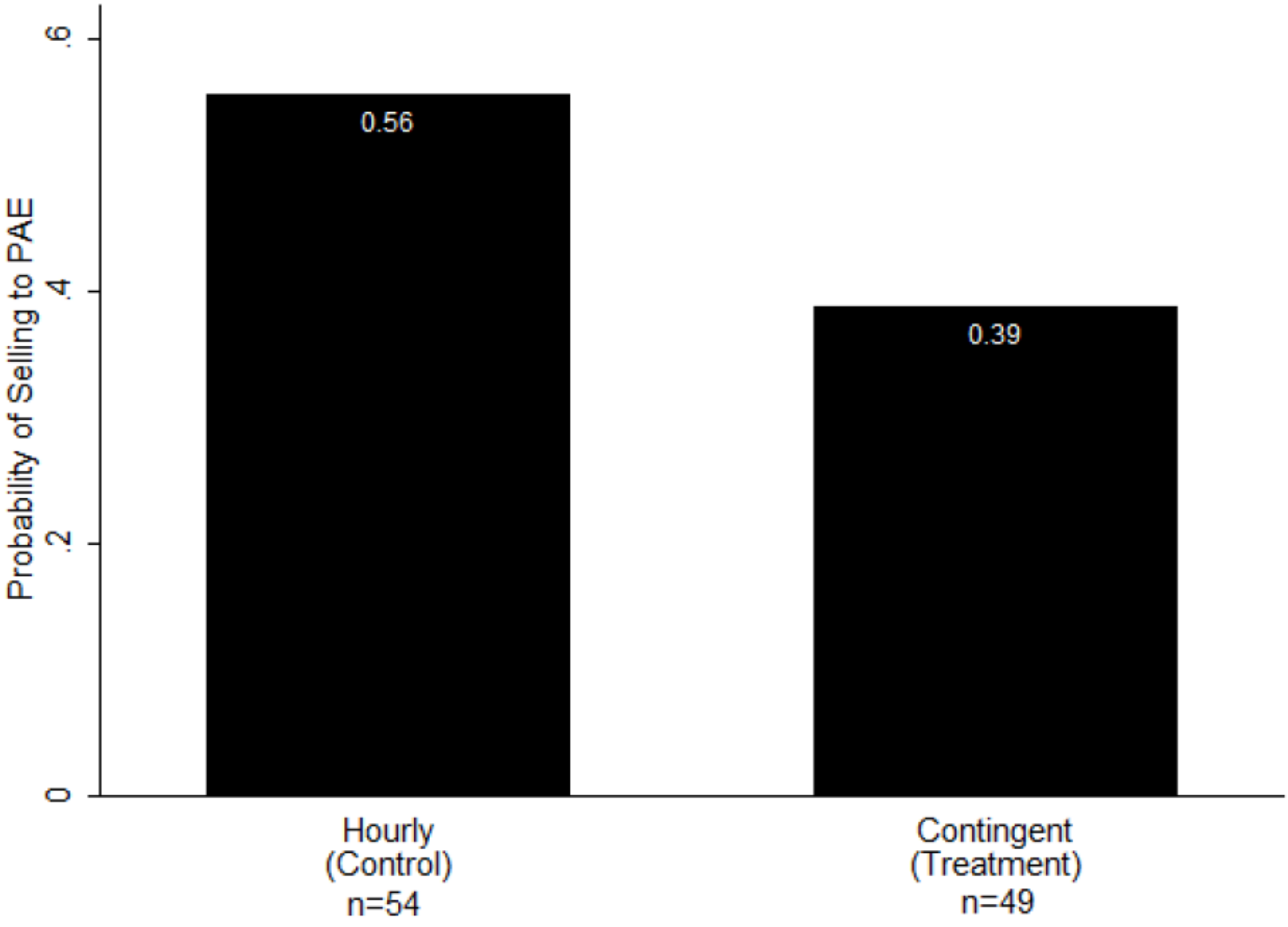
Table 1
Summary Statistics

	Mean	Min	Max
Filed patent application	.583	0	1
Female	.359	0	1
Age	29.563	19	57
Entrepreneur (vs. inventor)	.583	0	1
Loss averse (vs. loss-neutral)	.621	0	1
Observations	103		

Procedure

- Describe a new product
- Receive patent worth $1 million
- Infringed by large manufacturer
  - Sell to PAE for $100k
  - Hire lawyer for $1k/hr **OR** contingent fee (1/3)
- Gamble on coin flip to elicit loss/risk aversion
  - Loss: $1 for sure vs. $3 (50%) and -$1 (50%)
  - Risk: $1 for sure vs. $2 (50%) and $0 (50%)
- Demographics + inventor/entrepreneur

Figure 1. Average Treatment Effects

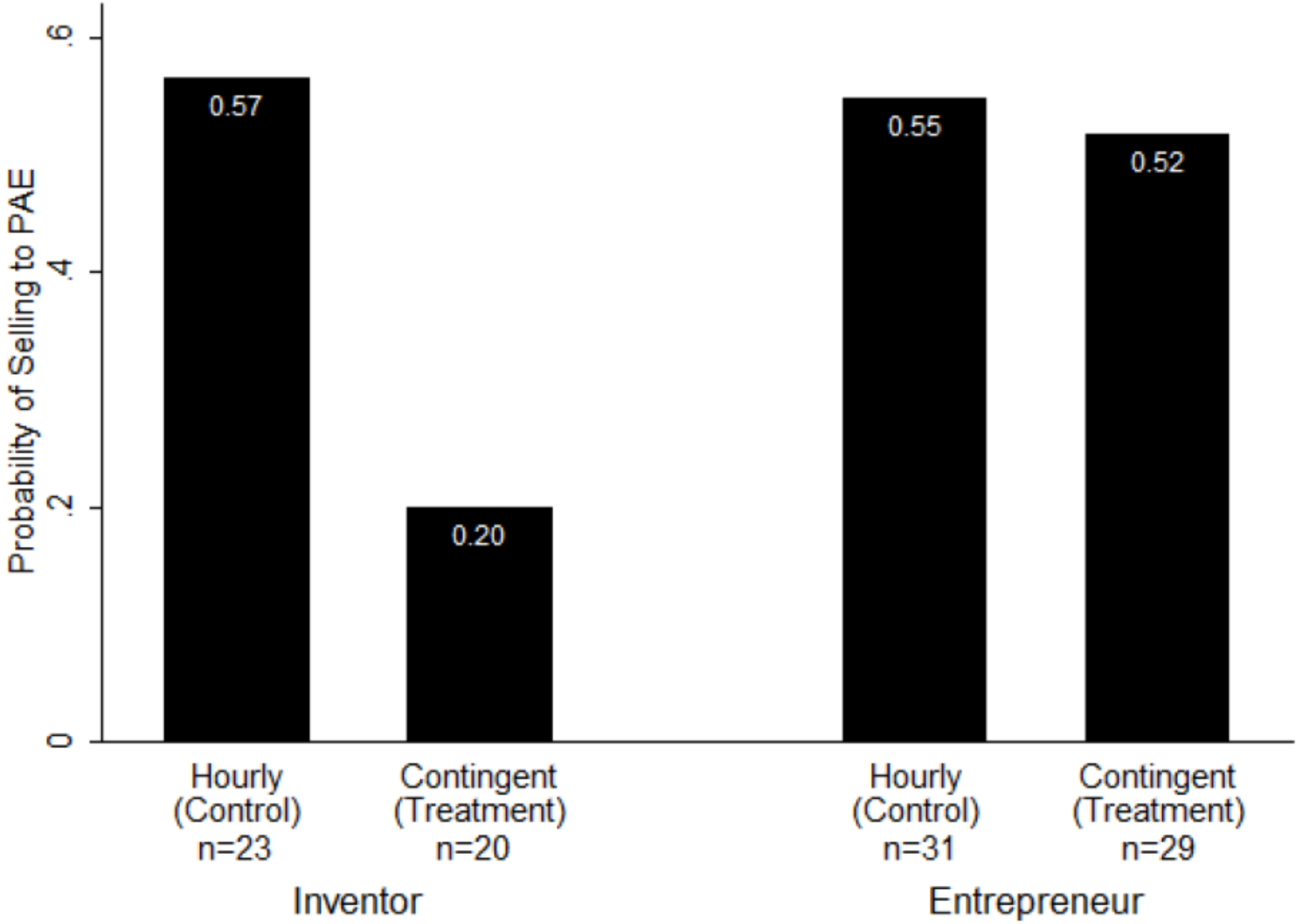


Average Treatment Effects

- Contingent fee treatment reduces the demand for PAEs.

- But our hypotheses predict heterogeneous treatment effects
  - Financially constrained
  - Loss averse

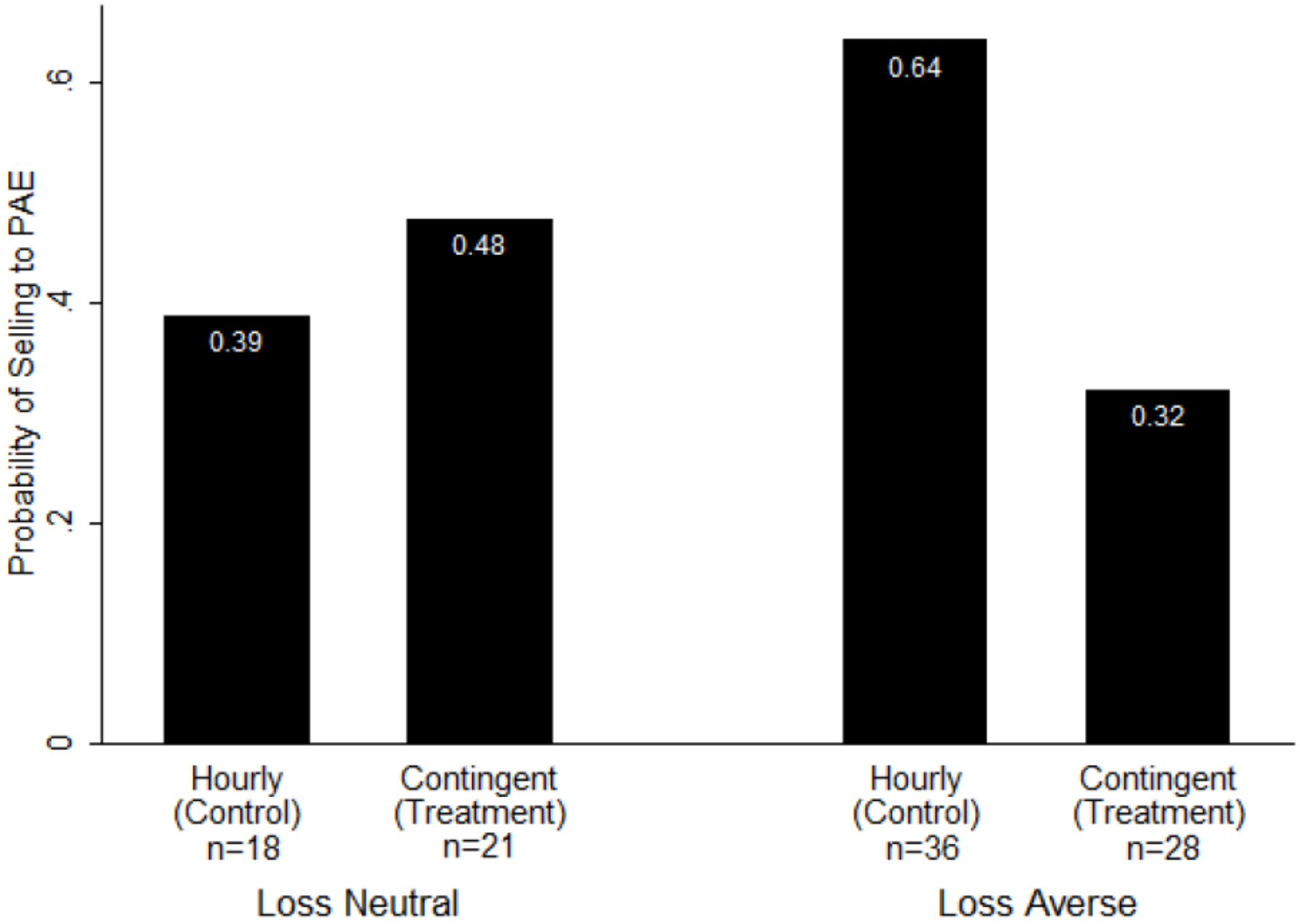
Figure 2. Treatment Effects by Financial Constraint



Inventor vs. Entrepreneur

- Treatment effects significant only for inventors
  - Robust to covariate adjustment, fixed effects, conditional fixed-effects
- Inventors and entrepreneurs behave similarly in control condition
  - Rules out alternative mechanisms, such as lawyer aversion, that are uncorrelated with constraints

Figure 3. Treatment Effects by Loss Aversion



Loss Averse vs. Loss Neutral

- Treatment effects are significant only for subjects who are loss-averse
  - Robust to covariate adjustment, fixed effects, conditional fixed-effects

- No significant interaction with risk aversion
- Loss averse ≠ inventor

Summary

- Inventors sell to PAEs because they are financially constrained in two ways
  - Upfront costs
  - Prospect of net losses
- Experimentally relaxing these constraints reduces the demand for PAEs for two groups
  - Inventors (vs. entrepreneurs)
  - Loss-averse subjects (vs. loss-neutral)

Implications

- PAEs may serve an intermediary role in the market for intellectual property between individual inventors and large manufacturers

- In the absence of PAEs, individual inventors might play a more limited role in the innovation ecosystem