

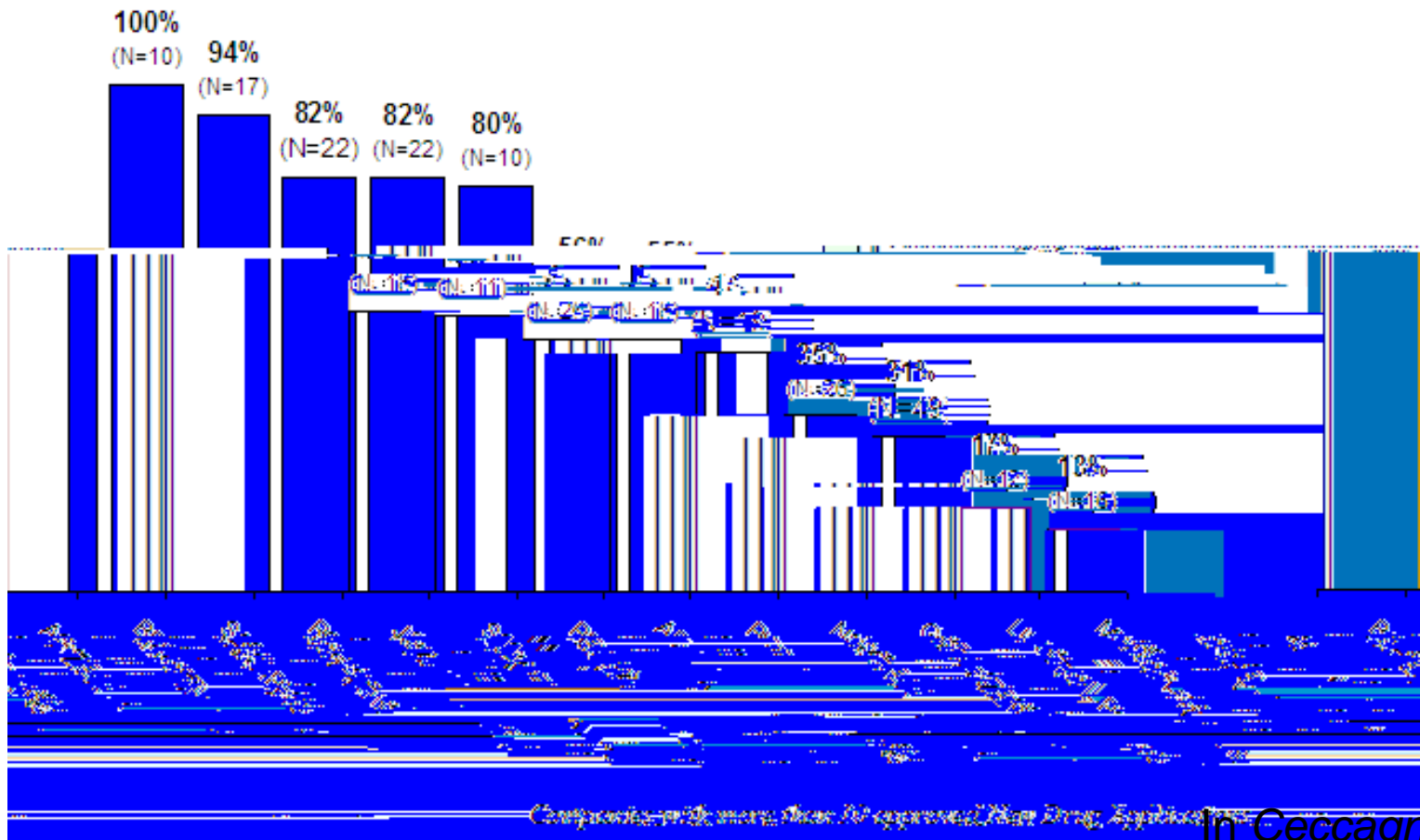
Research highlighted in this presentation

- “*Why do Start-ups Patent?*” S. Graham, T. Sichelman (2008). Berkeley Technology Law Journal, 23(3), pp. 1063-1097.
- “*Would the U.S. Benefit from Patent Post-grant Reviews? Evidence from a Twinning' Study,*” S. Graham, D. Harhoff (2008). *Working paper*.
- “*Entrepreneurship, Intellectual Property and Platform Technologies,*” T. Simcoe, S. Graham and M. Feldman (2009). Journal of Economics and Managerial Strategy. *Conditional acceptance*.
- “*Firm Reliance on External Knowledge in the Pharmaceutical Industry,*” ~~M. Cheng~~ ~~paper~~, S. Graham, (2009)

Markets For Technology (M4T): Not just in IT

Figure 1. Widespread use of technology markets in the pharmaceutical industry

Percent of new approved drugs based on externally-derived technology, 1989-2004



In Ceccagnoli, et al (2009)

Technology Entrepreneurship and M4T

The 2008 Berkeley Patent Survey (BPS)

- *Berkeley Center for Law and Technology* led effort
- Survey of U.S. “entrepreneurial companies” on innovation and patenting
 - Surveyed top managers in firms founded after 1997
 - Sample included over 15,000 companies, in biotech,

Some 2008 BPS Findings

- Young firms report less than 5% of revenues (mean) derive from licensing out their technologies.
 - But there are sector differences, with biotechnology firms more likely, and medical device firms less likely.
- Patents are significantly more important (for sustaining competitive advantage) to young firms as they generate more of their revenues from technology licensing.
- Generally, young firms rate patenting for “obtaining licensing revenues” as relatively unimportant compared to other reasons such as “preventing copying” or “enhancing company’s reputation”
 - But here too sectors matter, with biotechnology rating it more important compared to other sectors (but not within)

Patents, Litigation, and Standards

- Our research shows that
 - patents disclosed to standard-setting organizations (SSOs) are much more likely to be litigated
 - among smaller firms, the patent's disclosure to the SSO appears to be a triggering event for litigation
 - there is no divergence in the “quality” of the patents post disclosure for large and small companies
 - This result points toward a change in firm strategy, and not increased infringement
- In sum
 - Small firms involved in the SSO process appear to be using their disclosed patents differently
 - Is this evidence of “troll-like” behavior? Not necessarily
 - We interpret it more as evidence of vertical specialization
 - Small firms compete on upstream technology, while larger firms compete on downstream implementation (product markets)

In Simcoe, et al (2009)

Improving the transactional environment

- Welfare gains from the patent system
 - Costs: monopoly (deadweight) loss
 - Benefits: Incentives to invent, develop, commercialize, & transact, *plus* knowledge spillovers from disclosure
- Forces eroding welfare gains
 - Low “Quality”
 - Lacking requisite novelty, non-obviousness, utility
 - Uncertainty
 - Over final *boundaries* of the disclosure
 - Over the *validity* of the property right
 - Under- or misdirected investments
 - Confers market power to trivial innovations
 - Creates an environment inviting to costly litigation
 - Adds transaction costs to commercialization, technology transfer (licensing), developing markets for IP

Would the US benefit from adoption of Post-grant Review? Welfare Calculations

(1.1) *Save litigation expenses*

$W_{US} + \dots + P_L \cdot P_{OL} - H_{RL} \cdot P_{RL} - C_L$ (1.2) Removing excess market

Post-grant Review: Welfare Estimates

| Parameter | Scenarios | | | | | | | | | |
|--|-----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Current System Parameters | | | | | | | | | | |
| S_L | \$4 | \$4 | \$4 | \$2 | \$4 | \$4 | \$2 | \$4 | \$4 | \$2 |
| S_N | \$4 | \$4 | \$2 | \$1 | \$4 | \$2 | \$1 | \$4 | \$2 | \$1 |
| p_i | 0.032 | 0.011 | 0.011 | 0.011 | 0.011 | 0.011 | 0.011 | 0.011 | 0.011 | 0.011 |
| GH Estimates (Table 4, weighted averages) | | | | | | | | | | |
| n | 0.192 | 0.192 | 0.192 | 0.192 | 0.192 | 0.192 | 0.192 | 0.192 | 0.192 | 0.192 |
| | | | | | | | | | | |
| <p>Note: all cost and benefit figures in million US\$.</p> | | | | | | | | | | |

In Graham and Harhoff (2008)

Post-grant Review: Welfare Estimates

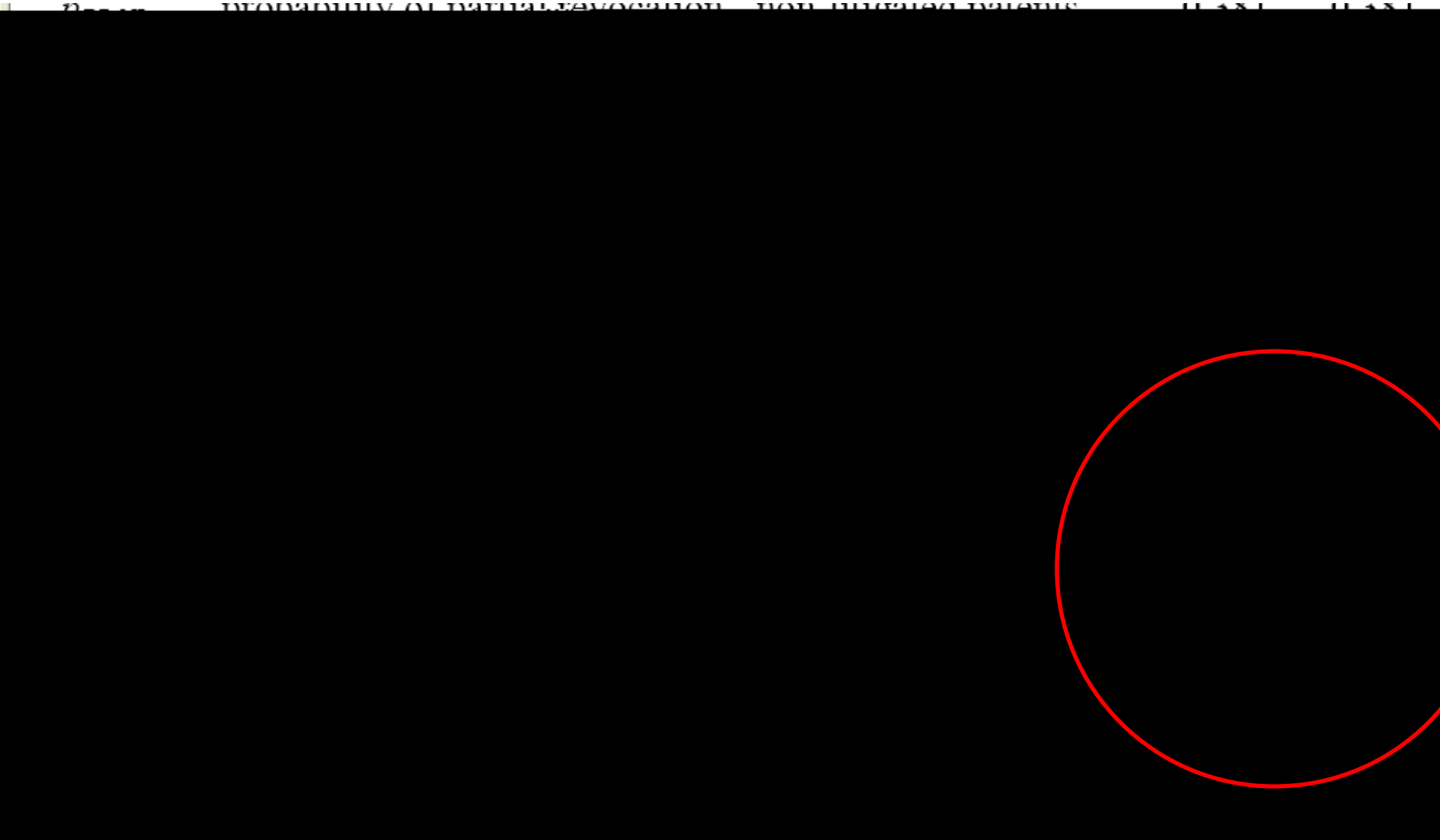
| | | | | |
|------------|---|-------|-------|--|
| PPR_{NL} | probability of partial revocation - non-litigated patents | 0.581 | 0.581 | |
| P_{NL} | probability of non-litigated patents | 0.581 | 0.581 | |
| P_{LIT} | probability of litigated patents | 0.419 | 0.419 | |
| C_O | cost of opposition | 0.10 | 0.10 | |
| C_A | cost of appeal against opposition | 0.10 | 0.10 | |
| W | welfare | 0.588 | 0.880 | |

Opposition Cost Estimates

Welfare and Total Cost Estima

in Graham and Hamon (2008)

Post-grant Review: Welfare Estimates



In Graham and Harhoff (2008)

In Sum...

- Patents in the M4T are relevant beyond electronics
- There is still much to learn, particularly as regards the relationship among Patenting, the M4T, and technology entrepreneurship
- There are substantial inefficiencies in the transactional environment
 - Reducing uncertainty over the boundaries and validity of patents being transacted would tend to dampen some inefficiencies
 - Post-grant review as a means to increasing society's welfare looks promising *if* costs of the process remain relatively low