Competing for the Market and the Market for Ideas: Antitrust & Innovation Policy Implications

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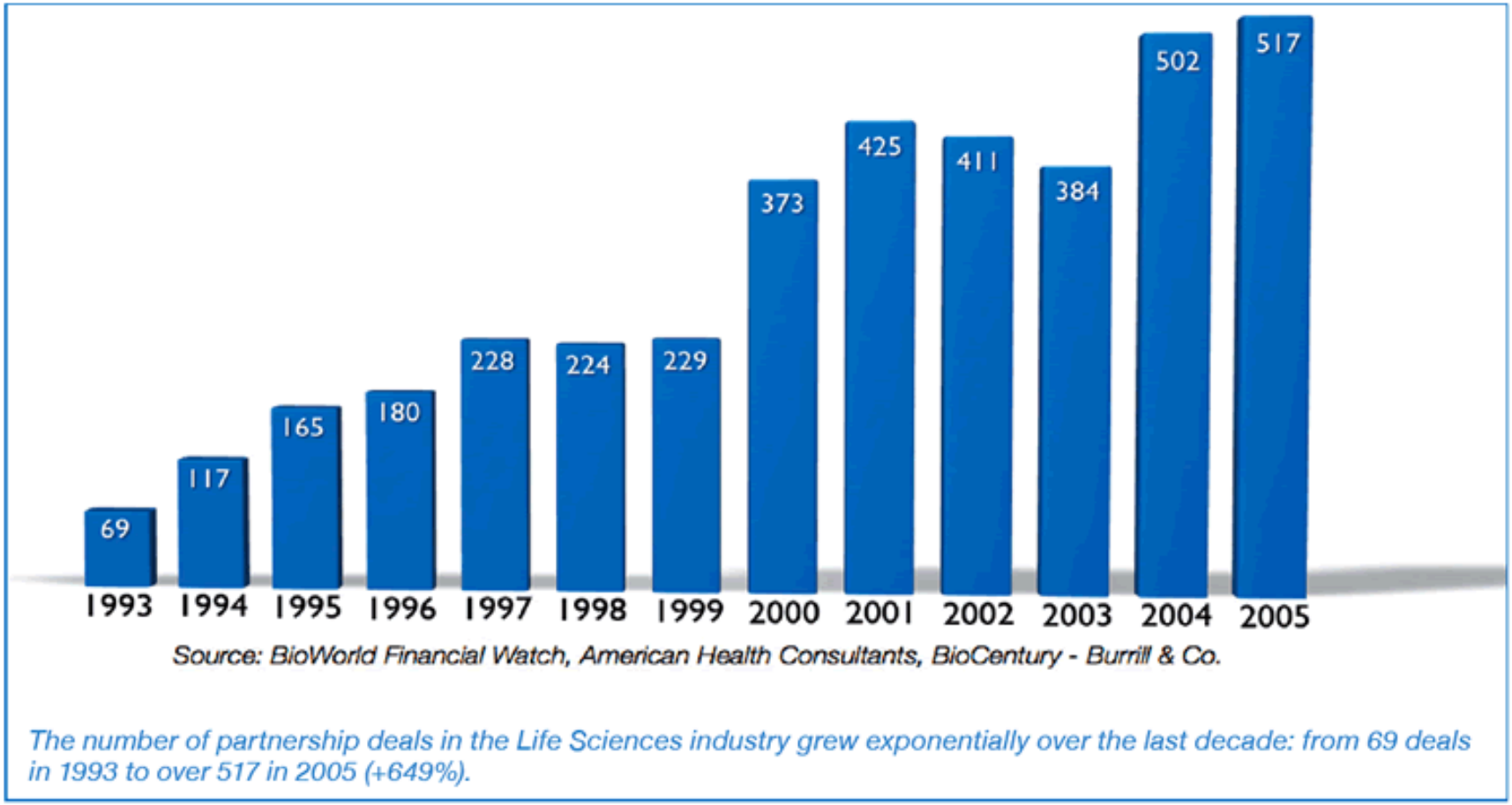
Two Key Questions

- How do *formal intellectual property rights* impact the likelihood of cooperative commercialization (through the market for ideas) between technology entrepreneurs and dominant incumbent firms?

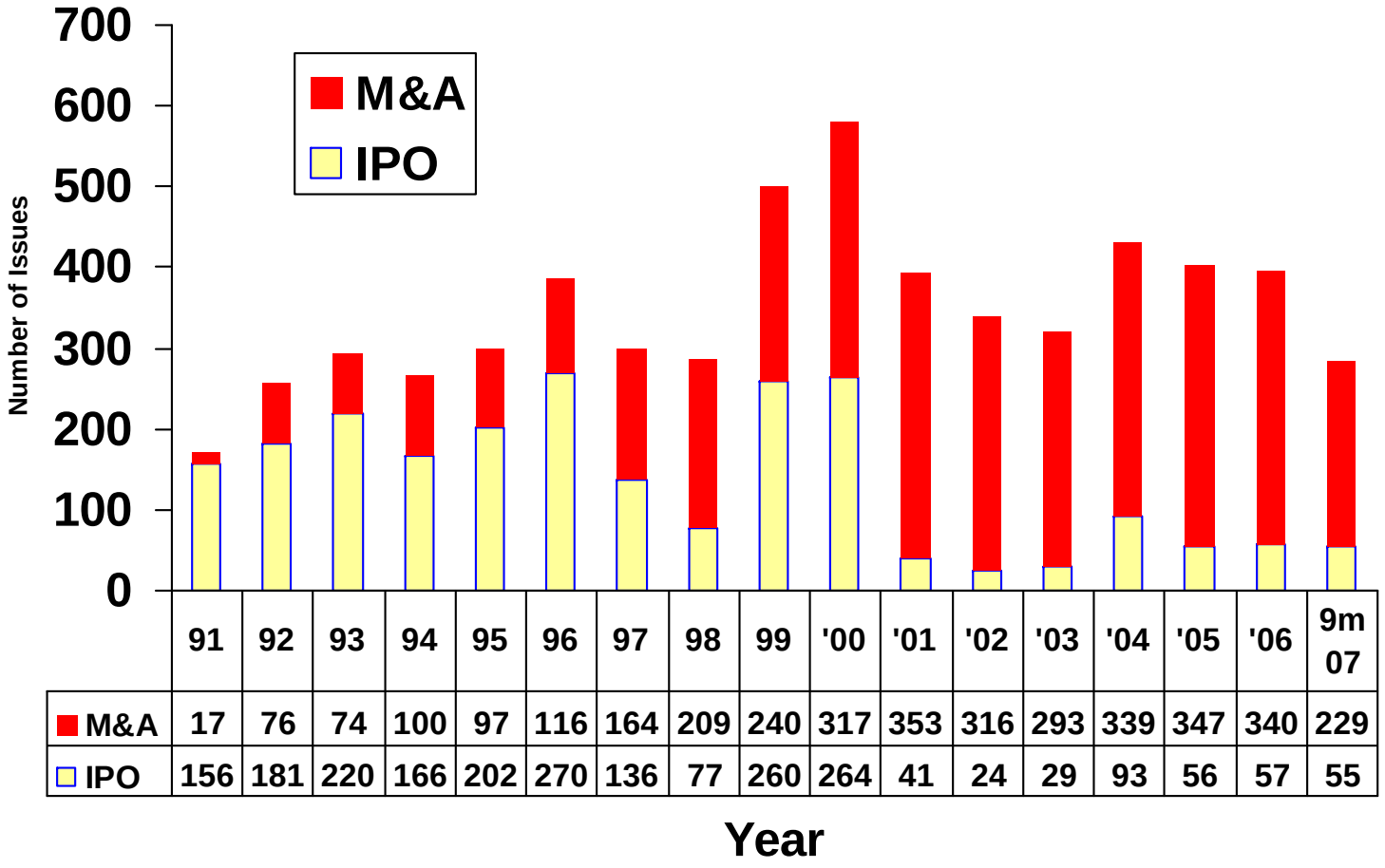
- What are the antitrust policy implications of cooperative commercialization, from the perspective of a dynamic analysis of innovation and commercialization?

In innovation-oriented sectors such as biopharmaceuticals, cooperative commercialization between start-up innovators and more established firms has emerged as the dominant mode by which new innovations are introduced



The number of partnership deals in the Life Sciences industry grew exponentially over the last decade: from 69 deals in 1993 to over 517 in 2005 (+649%).

Not simply a “biotech” phenomena, a sea change in VC strategy -- more than 80% of all *successful* VC liquidation events are now through the M&A route….



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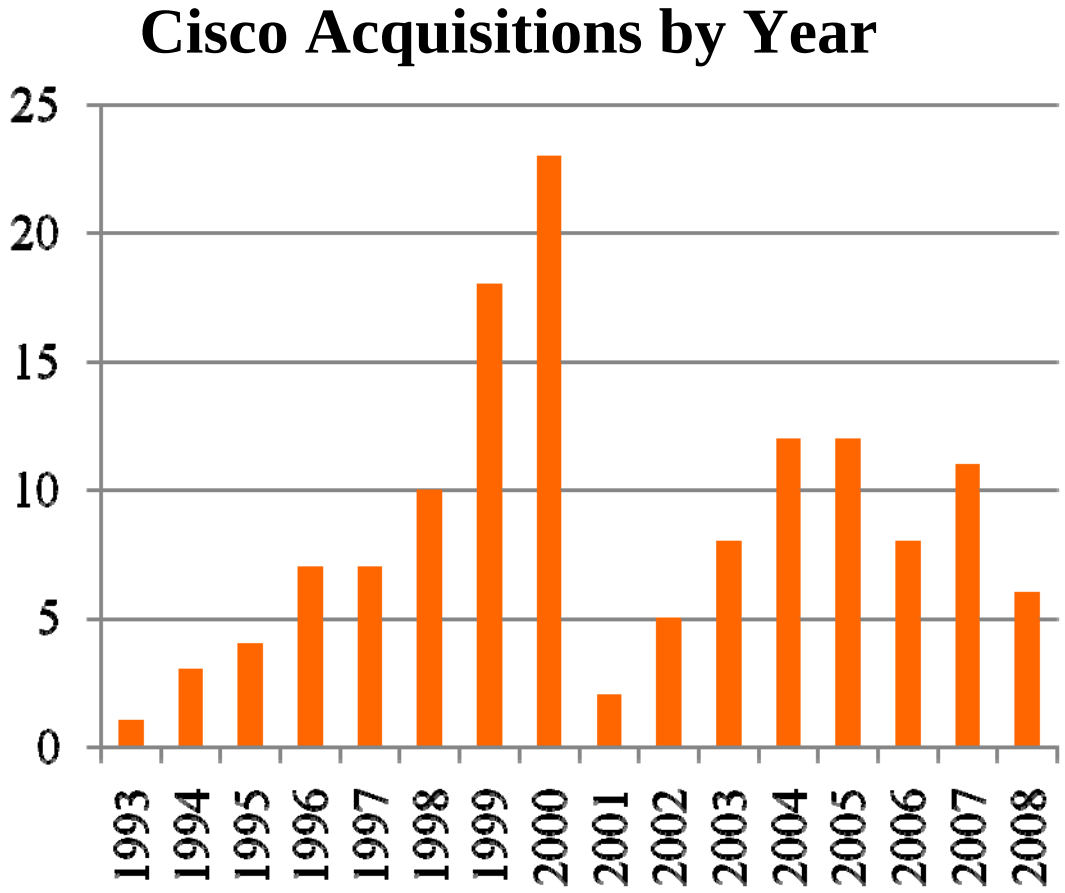
M&A	17	76	74	100	97	116	164	209	240	317	353	316	293	339	347	340	229
IPO	156	181	220	166	202	270	136	77	260	264	41	24	29	93	56	57	55

Year

Source: Thomson Financial/National Venture Capital Association

Some dominant companies such as Cisco rely explicitly on active licensing and acquisition of start-up technologies across *multiple* generations of technologies



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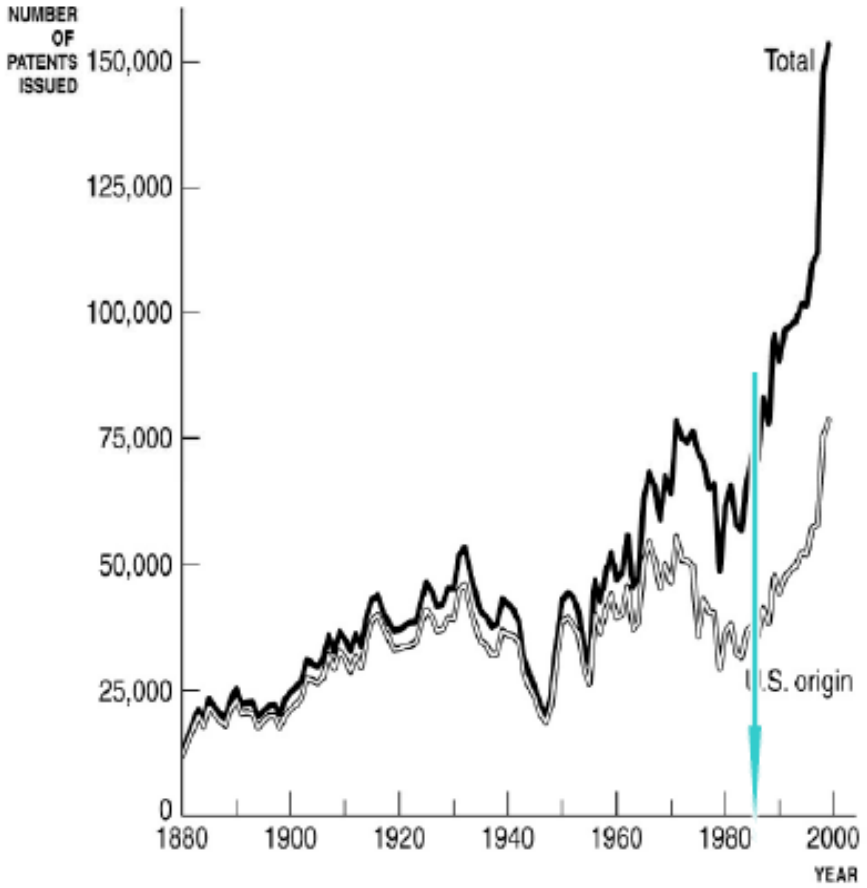
The Commercialization Hypothesis:

Effective intellectual property protection promotes trade in the market for ideas, and so enhances cooperative commercialization between start-up innovators and dominant established firms

Broad evidence for a suggestive correlation between the dramatic rise in patenting activity and the rise in licensing activity and receipts (Arora, et al)



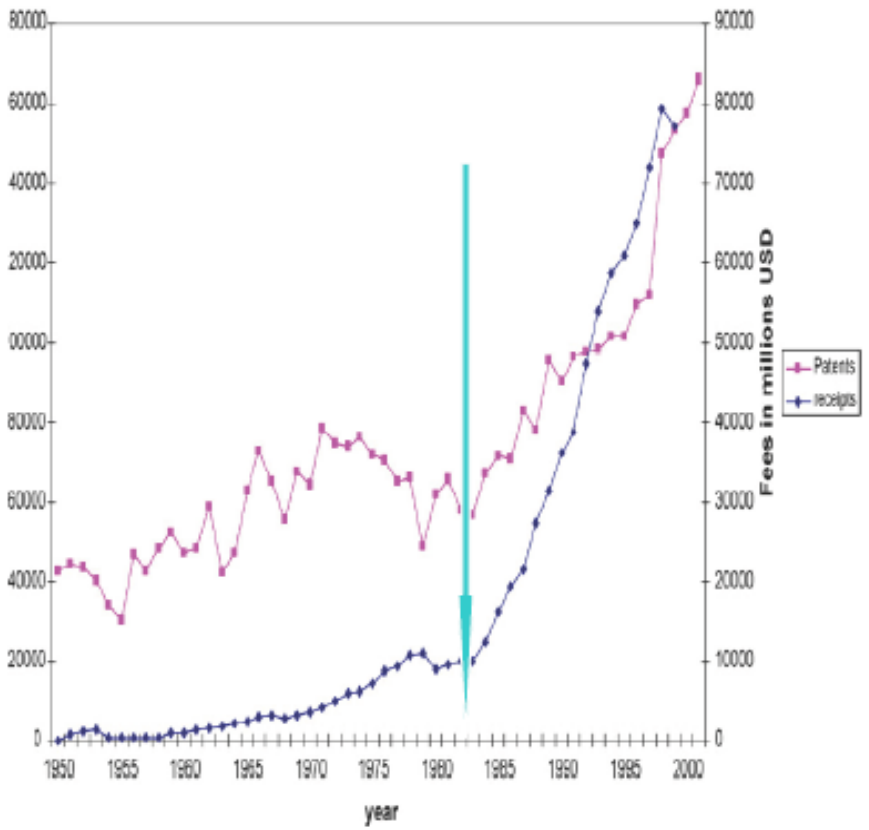


Fig. 2. Growth in non-US held patents and worldwide royalty and license revenues.

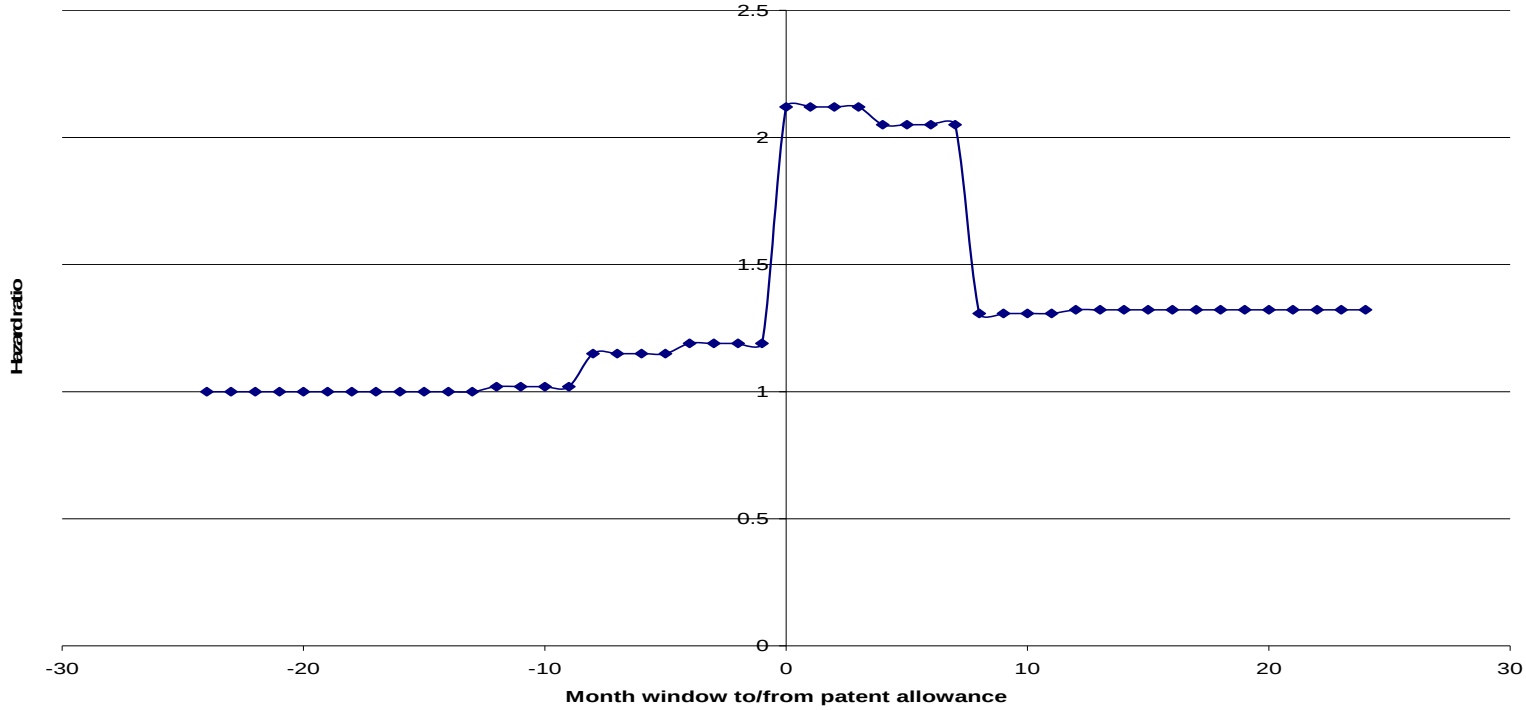
MIT Commercialization Strategies Survey

Figures represent the rate of cooperation within each "cell"		Do incumbent's complementary assets contribute to value proposition from new technology?	
		No	Yes
Can invention by the start-up preclude effective development by the incumbent?	No	14%	30%
	Yes	34%	56%

Start-up innovators earn their returns on innovation through the market for ideas when there is a strong IP regime, and innovators face high relative costs in acquiring and controlling complementary assets necessary for commercialization. As imperfections arise in the market for ideas (e.g., when patents are unavailable), start-up innovators pursue competitive strategies, contributing to the gale of creative destruction.

Adapted from Gans, Hsu and Stern, *RJE* (2002)

The Causal Impact of IP Rights (and the Operation of the Patent System) on the Market for Ideas



The timing of cooperation in the market for ideas is closely tied to the resolution of uncertainty -- the pace of licensing increases dramatically after patent rights are clarified. The dynamics of commercialization are influenced causally by the operation of the patent system

Adapted from Gans, Hsu and Stern, MS, 2008

Competition and the Market for Ideas

- A new role for formal intellectual property such as patents – not simply enhancing innovation incentives but enhancing the ability to contract in the market for ideas, facilitating cooperative commercialization and potentially avoiding product market competition between innovators and dominant firms.
- While most research on this *division of innovative labor* emphasizes that the shift towards cooperative commercialization has likely enhanced R&D productivity (and the level of R&D diversity), only preliminary attempts to draw out the *competition policy* implications of these shifts
  - The 1995 Licensing Guidelines offer broad guidance, primarily based on static analysis of isolated bilateral transactions
  - Few attempts to use the Licensing Guidelines to block transactions in the market for ideas between dominant firms and pre-competitive start-up innovators
- *What are the antitrust implications of the impact of formal IPR on cooperative commercialization?*

Antitrust in Innovative Industries, Segal and Whinston, 2007

- An explicit dynamic analysis of the impact of antitrust policy (by allowing or disallowing certain practices) on innovation incentives and welfare
- Basic Set-Up
  - At any moment in time, a leading firm has *exclusive* control over the "leading" technology in a step-by-step innovation process, and only faces competition when an innovator firm develops a breakthrough that displaces the old technology (which then serves as a competitive backstop technology), at which point the "old" incumbent becomes the new potential entrant (and vice versa)
  - The incentives for the "outsider" to enhance the probability of innovation, φ, are grounded in the expected nature and duration of product market competition once a breakthrough has been realized
    - Degree of competition during a transition period with the current incumbent
    - Length / Size of monopoly profits after the current incumbent has been replaced
    - Degree of competition during a transition period after subsequent innovation displaces the "new" incumbent
  - Incumbent firm actions to deter potential entrant R&D (e.g., long-term contracts with customers) are constrained by an antitrust policy parameter, α

Segal and Whinston (continued)

- The antitrust policy parameter, α, shifts the "innovation benefit" curve (IB) without affecting the "innovation supply" curve (IS)
- If the IS curve is upward sloping, the dynamic equilibrium impact of antitrust policy on innovation incentives can be evaluated in terms of the impact of such a policy on the "returns" to innovation, IB

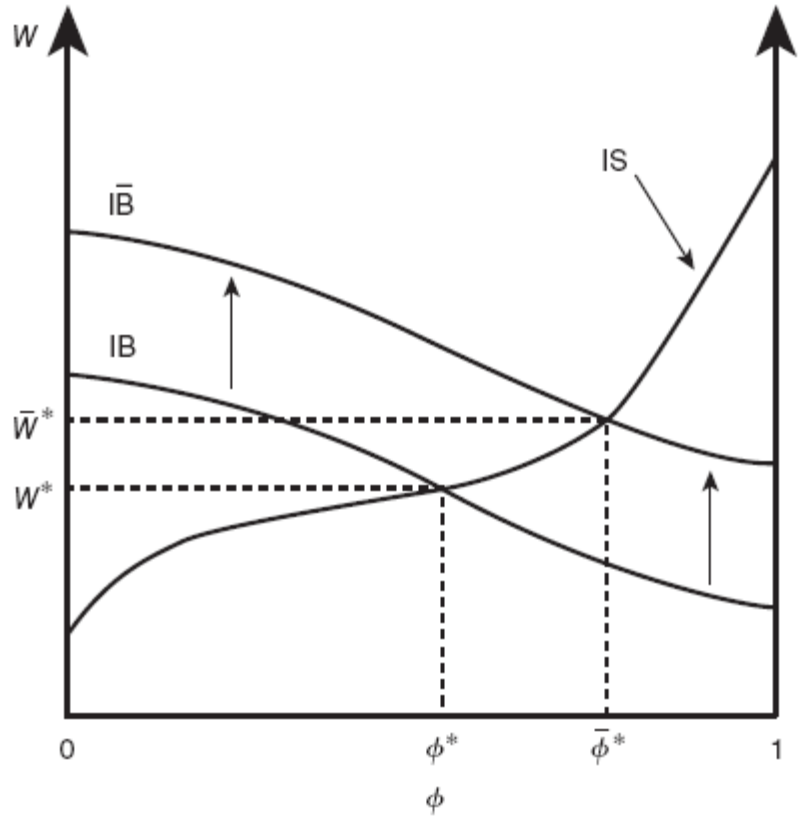


FIGURE 1. COMPARATIVE STATICS

Segal and Whinston: Key Insights

- The very practices that may be seen as *barriers to entry* by a traditional antitrust analysis may also serve as *innovation incentives* since the returns to *being* the monopolist are higher when antitrust policy is more permissive of exclusionary and R&D-deterring activities.
  - Exclusionary practices whose main objective is to deter R&D and entry also enhance innovation incentives on the margin for precisely the types of radical innovation that induces displacement

- At the same time, the *net* impact of allowing such policies can still often be detrimental – since the "cost" to the potential entrant is incurred during the earliest stages after a breakthrough (during their transition to being the monopolist) while the innovation incentive "benefits" of exclusionary practices are discounted farther into the future

SW and the Market for Ideas

- SW make two important knowledge transfer assumptions
  - The strategic actions of the monopolist only impact the returns to innovation but have no impact on the innovative productivity of the potential entrant (i.e., they cannot shift the IS curve). Specifically, the potential entrant has adequate access to the incumbent technology in order to leap-frog it, and has access to human and financial capital to undertake R&D effectively
  - At the same time, once the entrant has developed a breakthrough, the *only* strategic action available is to *enter* the product market and so displace the incumbent.
- But….
  - Some types of exclusionary conduct actually has the objective of reducing the ability and productivity of entrant R&D, by maintaining secrecy over certain standards, witholding certain data, or restricting the employment of key R&D personnel (non-competes, etc)
  - Also, once the innovation has been developed, both the current incumbent and potential entrant would prefer to collude, in order to avoid direct product market competition, and perhaps enhance commercialization efficiency

What is the impact of alternative policies allowing (or disallowing) different types of transactions in the market for ideas?

Enhancing Entrant Access to Incumbent Technology (even if still excluded from the product market) can significantly Enhance Innovation Activity and Welfare

- Any strategic action by the current incumbent to reduce R&D productivity of the potential entrant reduces total innovation incentives (and the rate of innovation and welfare) (SW; Gans, 2008)
  - At any stable equilibrium, any downward shift in the IS curve reduces welfare
  - Moreover, this first-order effect on IS dominates any enhancements to the IB curve (an extreme front-loading effect)
- However, the ability of potential entrants to access the technologies of current incumbents – even if they are prohibited from the product market by IP – is severely limited. Trade secrecy, proprietary systems, exclusionary standards all serve to reduce the ability of innovators to leap-frog current technology, with large potential negative welfare consequences

*The Combination of "Competing for the Market" Policies and Enhanced IPR Protections Implies the **Persistence** of Dominant Firms*

- Schumpeterian analyses that emphasize that innovators "compete for the market" often advocate loose antitrust treatment of dominant firms, since the market will be characterized by "serial monopolists" who are disciplined by start-up innovation competition
  - Many of these same analysts also advocate for enhanced IPR protection, in order to establish clear and unambiguous property rights over breakthrough technologies
- However, if enhanced IPR protection facilitates a market for ideas, and loose antitrust policy likely includes limited review of mergers / licensing between dominant firms and start-up innovators, the equilibrium prediction is not *serial monopolists* but *serial innovators* commercializing with a *persistent dominant firm*

Concluding Thoughts

- Significant evidence that *formal* intellectual property serves to enhance the rate and extent of cooperative commercialization, particularly between start-up innovators and dominant incumbent firms

- Little analysis so far of the impact of this "sea change" in technology entrepreneurship on antitrust policy

- Preliminary analysis suggests that antitrust practices that allow dominant firms to reduce innovator R&D productivity likely reduce welfare, and that practices that allow for free-form licensing and acquisition between start-up innovators and dominant firms reduce the competitive pressures associated with technology entrepreneurship