

# Should Technology Entrepreneurs Care about Patent Reform?

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# Magic Patents

- From a classical perspective, the patent system simultaneously address three key problems:
- Enhancing Innovation Incentives
  - The private benefits to develop a technology will be lower than the social incentives (often MUCH lower) in the absence of a mechanism allowing innovators to exclude others from using
- Providing Commercialization Incentives
  - The private benefits of commercializing a technology may be much lower than the social incentives in the absence of a mechanism that allows innovators to cooperate with those positioned to apply the technology
- Lowering Innovation Costs Over Time
  - The private cost to develop a new technology will be increased (often GREATLY increased) without low-cost and transparent access to the knowledge underlying existing technologies
- The “trick” of the patent system (at least in principle) is to exchange innovation incentives for disclosure by providing limited property rights, even though each is in the public interest

# The Trick Revealed

- However, the very formulation of the “solution” implicitly recognizes that innovation is a cumulative process
  - “Multi-stage” (commercialization is more than invention)
  - “Step-by-step” (multiple research generations)
  - “Seed Corn” (multiple avenues for progress from a single idea)
- But, can one provide appropriate innovation incentives for innovators, establish well-defined and appropriate property rights, and provide an efficient level of disclosure?
- A Hornet’s Nest of Questions about Patent System Design and Operation
  - How should rights be *divided* across different research generations?
  - How can the establishment of a property right serve as seed corn (rather than a tax) on future research generations?
  - If the right to exclude lasts N years, why is disclosure required at the time of (or even prior to) patent grant?
  - Does an innovator have a duty to reduce the costs to innovators during the time that their patent is valid?

# Raising the Curtain

- Rather than providing a one-size-fits-all solution to the “innovation” problem, increasing awareness that the design and operation of the patent system engenders its own set of externalities
- The Private Incentives for Innovation
  - *Not only at the expense of consumers but at the expense of other research generations?*
- Establishing Property Rights for Efficient Commercialization
  - *With the potential for hold-up, even when a single innovation is a small part of an overall system*
- Allocating the Right Rights to the Right Innovator
  - *But does anyone have an incentive to reach the “truth,” particularly when there are multiple users of a technology and multiple interacting patent claims?*
- Establishing Access to a Certified Knowledge Stock
  - *But do the requirements for disclosure impinge on the other objectives?*
  - *Who has incentives to ensure the fidelity and accessibility of the knowledge stock?*
- *Increasingly, less “magical thinking” about the patent system. This is a considerable advance.*

# So What does the Patent System Actually Do?

Operation of the  
Patent System  
(Cohen & Merrill, 2003;  
Jaffe and Lerner, 2004; Popp and  
Johnson, 2004; Regibieu and  
Rocket, 2003;  
Harhoff and Reitzig, 2004;)

Markets for Technology  
(Pisano, 1991; Nelson and  
Merges, 1993; Arora et al, 2001;  
GHS, 2002; Chesbrough and Teece,  
Katila and Mang, 2003;  
Dechaneaux, et al 2003;  
Elfenbein, 2005 etc )

Evolution of Technology Markets  
(Schumpeter; Foster, 1986;  
Henderson and Clark, 1990,  
Christensen, 1997  
Tushman, et al; Baumol, 2001;  
Gans and Stern, 2003

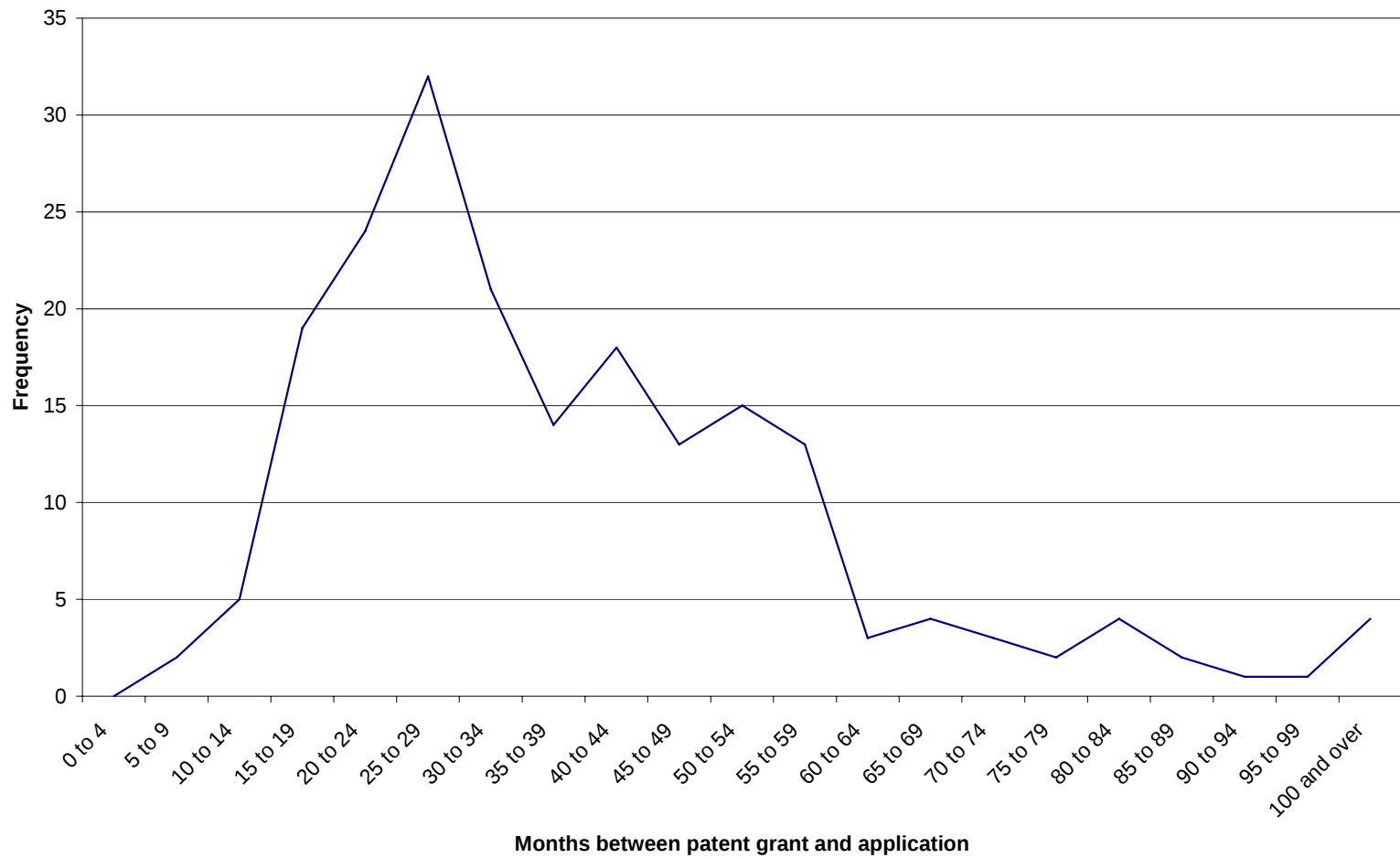
## *The Commercialization Hypothesis:*

*Effective intellectual property protection  
promotes trade in the market for ideas,  
and so enhances efficient cooperative  
commercialization*

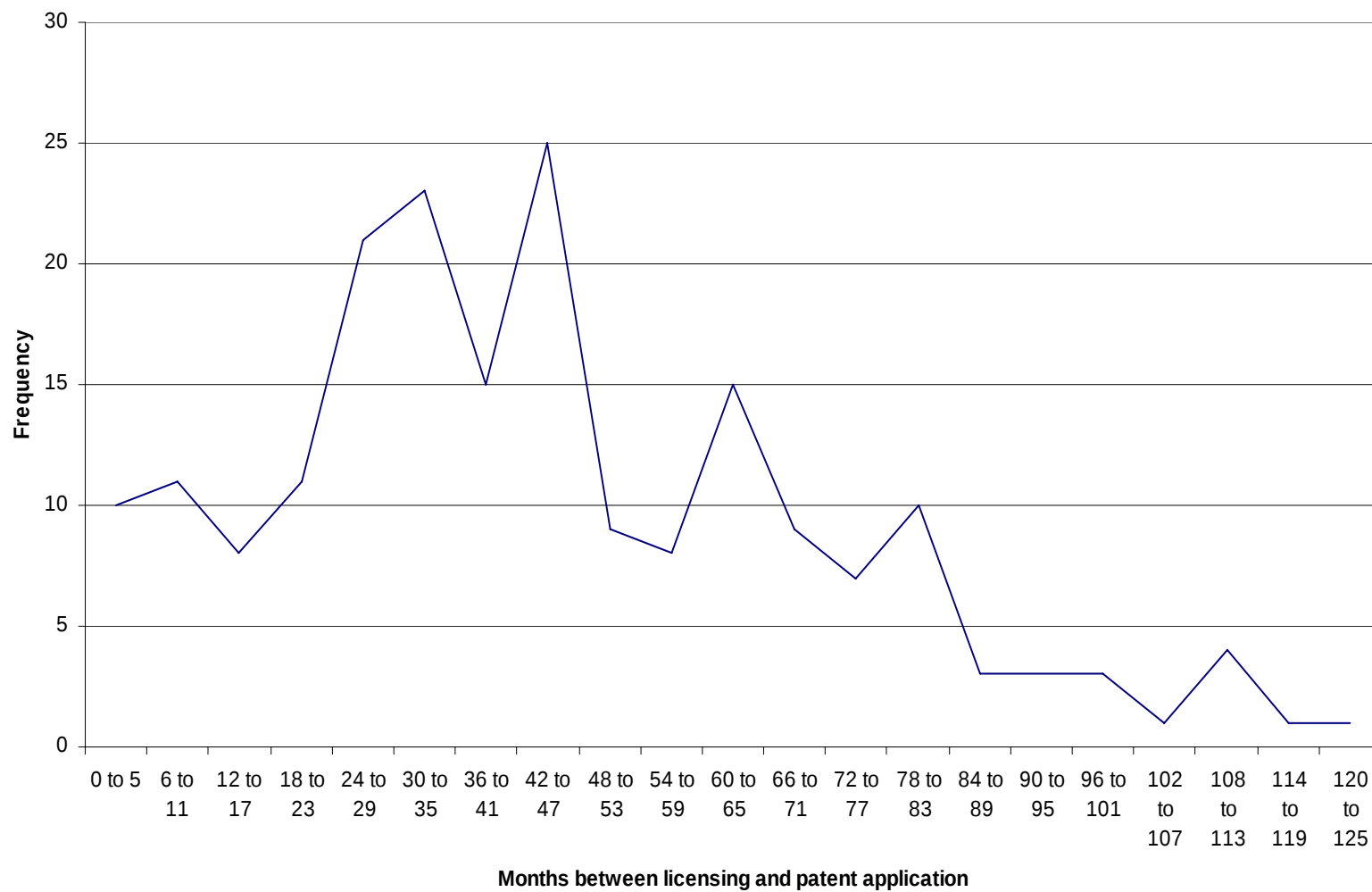
# The Impact of Patents on the Commercialization Strategy of Technology Entrepreneurs

- While most analysis assume that patent grant is, at best, an “administrative detail,” patent grant delay is significant & substantial
  - No rights until patents are granted
  - Rights are uncertain until patent is granted
  - “There are as many patent offices as there are patent examiners” (Cockburn, Kortum, and Stern, 2003)
- Patent grant results from a detailed set of interactions between an applicant (and her counsel) and a specialized patent examiner
  - Traditionally, 8-10 months before application receives even makes it to the “top of the pile” for a first review
  - Multiple rounds, with the ability of the applicant (but not external parties) to provide documentation, explain their case, etc.
- To the extent that one role of the patent system is to enhance the ability to trade in the market for ideas, and if grants are uncertain (in particular ways), then efficient commercialization may be impeded in the absence of patent grant itself
- ***How does the timing of patent grant impact the timing of licensing and commercialization?***

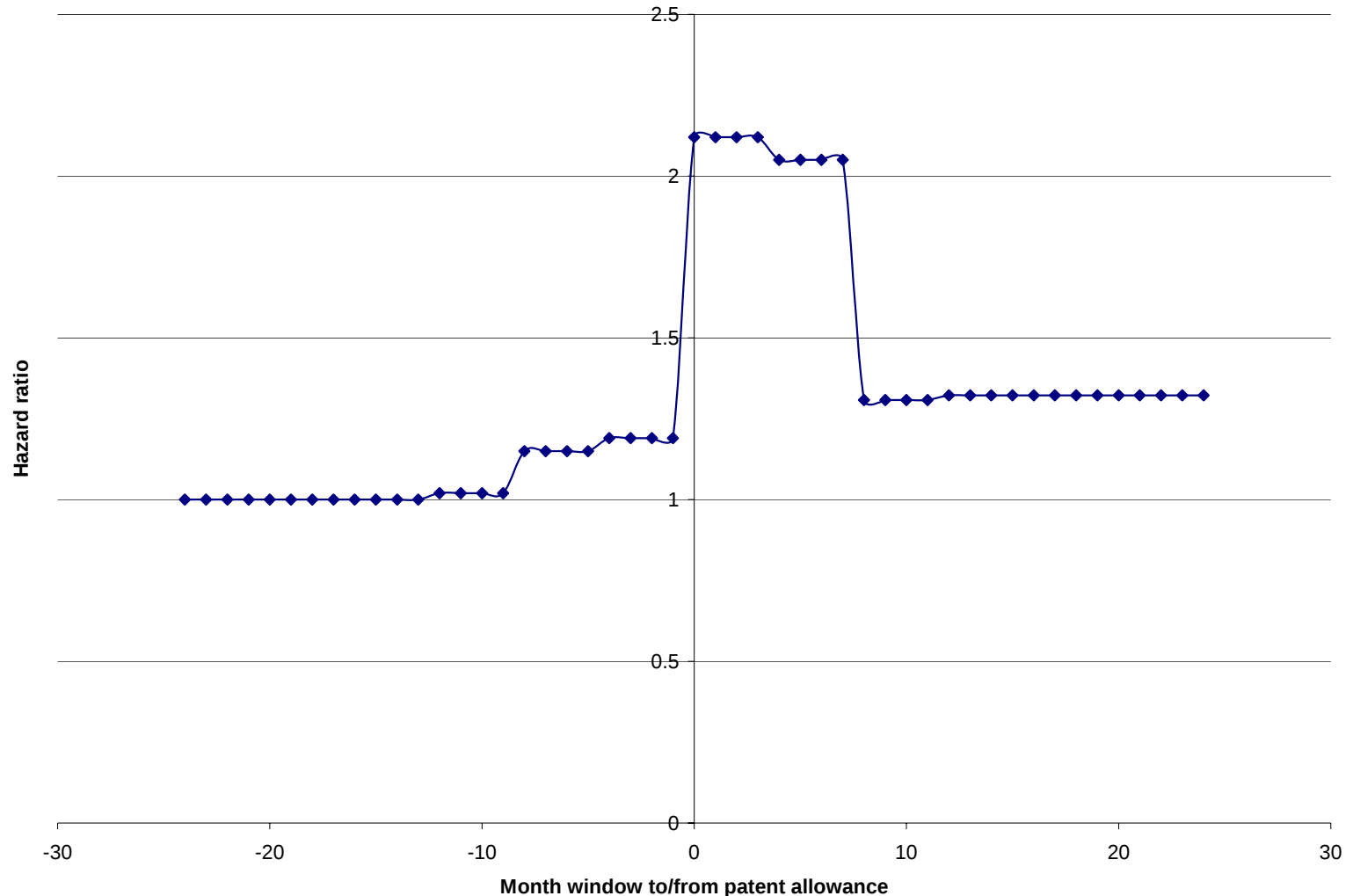
**Figure 1A. Distribution of Patent Grant Lag**



**Figure 1B. Distribution of Licensing Lag**



*The hazard (i.e., timing) of licensing is very closely tied to the resolution of uncertainty over patent rights allowed*



*The Commercialization and Disclosure Environment are crucial drivers of the structure and scope of markets for ideas and the evolution of technology.*

*Patents may facilitate transactions, enhancing development*

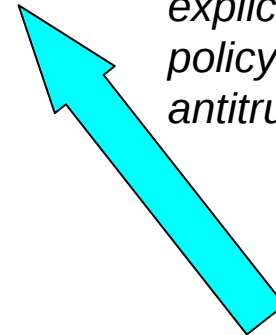
The Commercialization  
And Disclosure  
Environment

*The structure of innovation-driven markets itself shapes the commercialization environment, as reputations are developed, brokers are established, or even through explicit coordination and policy choices (e.g., IPR, antitrust, etc)*

Markets for Ideas

*Markets for Ideas can undermine Schumpeterian dynamics, and serve as a core driver of the evolution of innovation-driven markets. In the presence of a market for ideas, incumbent competitive advantage can be reinforced by technology entrepreneurship*

Evolution of  
Innovation-Driven  
Markets



# Does Patent *Reform* Matter?

- The impact of the patent system is not limited to innovation incentives; instead, the patent system has a separate impact on the nature of strategic interaction among firms and the ability of innovators to build on each other's inventions and discoveries
- Consequently, even if a change in the patent standard has little impact on overall innovation incentives, the ruling may have a significant influence on the nature of technological innovation, the commercialization of innovation, and the evolution of technology markets

# Patent Reform and Technological Innovation

- By changing the standard for patentability and changing the subject matter which may be patented, current reform proposals raise the returns for more significant innovations that are clearly above the new threshold
  - Since most reform proposals are aimed are likely to reduce the total number of patents in a given technology area (for a given level of advance), raised standards increase the returns to establishing a foothold in any given area
- More subtly, reform proposals aimed at enhancing the obviousness requirement (e.g., changes due to the *KSR* decision) shifts the returns to investment towards projects involving less “obvious” combinations
  - Drawing on a more diverse array of prior knowledge
  - Perhaps more diverse or “unanticipated” technical teams
  - Perhaps reduces the incentives for relying on (or appropriately disclosing a reliance on) prior scientific research

# Patent Reform and Technology Commercialization

- In the long term, patent reform holds out the promise for significant enhancements in the efficiency of the operations of the patent office and reductions in the uncertainties associated with applications and rights granted. Fuller vetting of patents (e.g., post-grant opposition, subject matter clarity) increases the liquidity (and timeliness of transactions) in the market for ideas
  - Enhances commercialization efficiency for technologies which are associated with valid IPR
  - Particularly important for reducing variation among examiners in patent office practice (Cockburn et al, 2003)
- However, in the near term, patent reform proposals and judicial review of patent standards is likely reducing the level of certainty (and enhancing differences in perceptions and beliefs about what is enforceable). These risks retard the ability to use patents as a mechanism to achieve efficient commercialization

# Patent Reform and the Evolution of Technology Markets

- Increases in the liquidity and range of markets for ideas tends to encourage cooperative commercialization between technology entrepreneurs and incumbent firms, potentially reinforcing existing patterns of competitive advantage
- Shifts in the mix of innovation towards more “diverse” or more unanticipated combinations may make the ability to identify and contract with an effective downstream partner decline, spurring pro-competitive technology entrepreneurship
- Patent reform is likely to reinforce cooperative commercialization in some areas (e.g., those with increases in the “clarity” of rights) and deters the market for ideas in areas where subject matter is no longer patentable

# Should Technology Entrepreneurs Care About Patent Reform?

- Rather than thinking about patent reform as exclusively a shift in legal rules, consider its impact on overall technology strategy and commercialization choices
- Patent reform will have a significant impact on patent office practice, which is likely to influence the strategic use (and misuse) of patents by entrepreneurs and established players, and impact the evaluation of formal IPR by venture capitalists
- One worrying possibility: *Since reform is primarily aimed at reducing speculative grants in areas that are not well-understood, will patent reform reduce the ability of technology entrepreneurs to gain early-stage financing because of their inability to stake out an early IPR position in a rapidly evolving technology landscape?*