

IMF 2005: The Case Against Intellectual Monopoly

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Should we have intellectual property at all?

should we have

- patents
- copyrights

should we limit

- non-disclosure agreements
- shrink-wrap agreements

Is Intellectual Property “Property”?

What is property and why is it a good idea?

- property cannot be taken away without permission
- property can be sold
- this provides incentives to produce and trade

Why intellectual property is not property

- it is **copies** of ideas that have economic value, abstract ideas have no value
- copies of ideas are “property”; abstract ideas are not
- copies of ideas should not be taken away without permission, it should be legal to sell copies of ideas
- copies of ideas are not a public good: the fact that I can use my copy of your idea without limiting your ability to use your copy of your idea no more implies a “public good” or “externality” than the fact that I can drink from my coffee cup without limiting your ability to drink from yours
- intellectual property is about the right to control other peoples’ copies of an idea, not about the right to control your own copy of an idea
- “intellectual property” = intellectual monopoly

The Conventional Wisdom

the economics literature in general acknowledges that intellectual property leads to undesirable legal "intellectual monopoly," but generally argues that this might be a good thing

Kahn (1962) "The Role of Patents"

"This issue is not one of principle but of practical social engineering: how much protection...of what kind is required and worth paying for"

Suppose that "protection" meant "trade protection"

Our question: "Should we allow intellectual property at all?"

Reasons for Intellectual Monopoly

- **unpriced** spillover externalities – the example of the wheelbarrow
- prevention of secrecy – replacing private with public monopoly
- indivisibility and fixed cost

Are there Unpriced Spillovers?

Hard to see why they should be unpriced

Employees moving from firm to firm seem the most likely culprit

(from Gary Becker's textbook) "Firms introducing innovations are alleged to be forced to share their knowledge with competitors through the bidding away of employees who are privy to their secrets. This may well be a common practice, but if employees benefit from access to salable information about secrets, they would be willing to work more cheaply than otherwise."

- Evidence scarce to say the least; motivated by observations that firms in an industry tend to locate close to each other; best evidence (Ellison and Glaeser) is weak

Unpriced spillovers or simple minimization of transaction cost? Easier to transact, move and so forth when at the same location

- Are the externalities important in practice?

Secrecy

Does patent replace trade-secrecy?

- Ideas for which the secret can be kept longer than the patent term will not be patented
- Ideas for which the secret cannot be kept anyway will be patented
- Patent applications are too vague to make much difference anyway
- Patents discourage sharing of intermediate information with competitors – you don't want to help them to get the useful patent and shut you out of the market

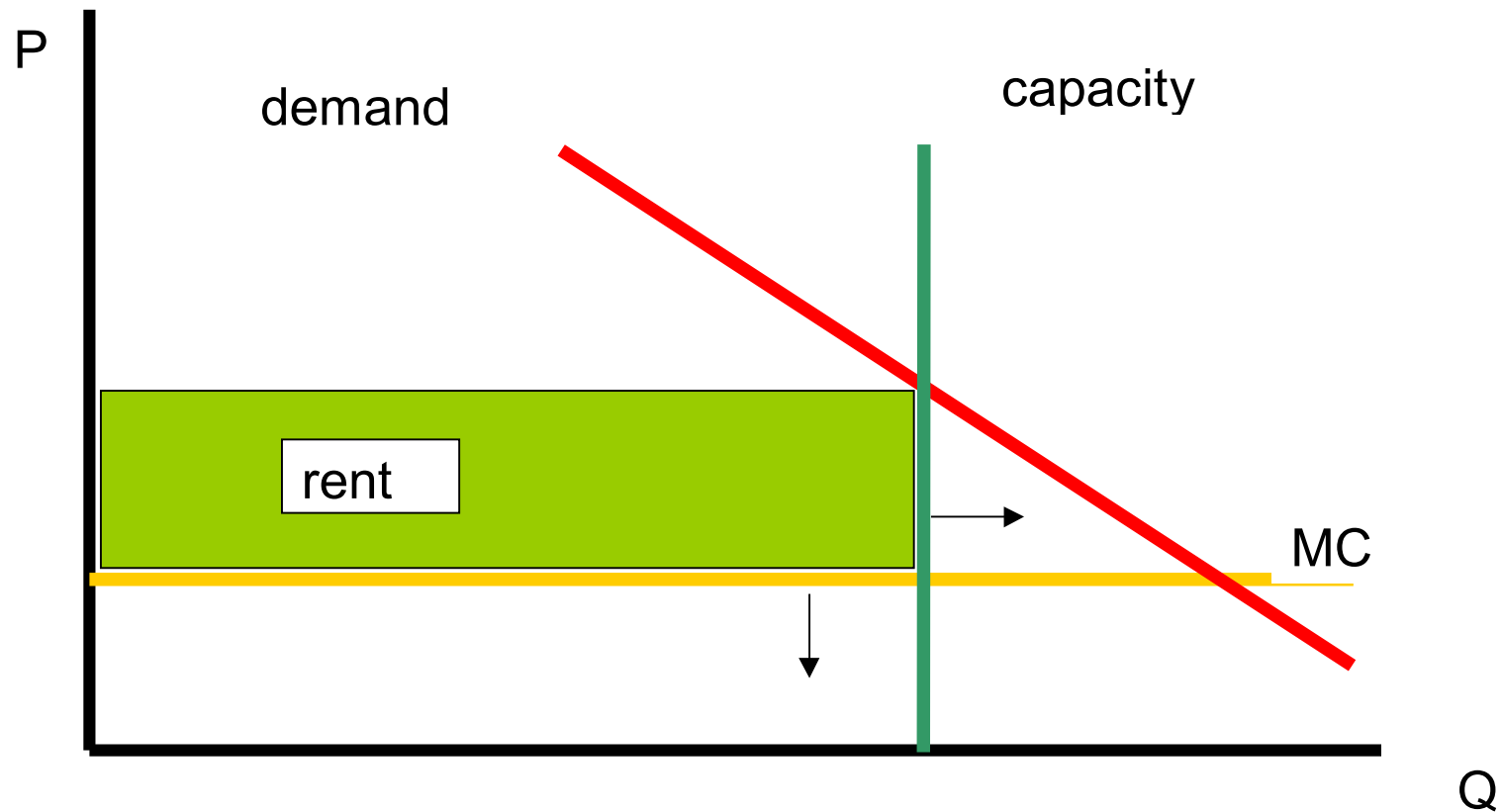
Indivisibility and Fixed Cost

- ◆ information, ideas are a “public good” means zero marginal cost of distribution → increasing returns to scale
- ◆ increasing returns to scale
 - fixed cost plus
 - constant marginal cost (nothing essential about zero) plus
 - marginal cost pricing → ***the firm loses money***
- ◆ if this were true intellectual monopoly would be necessary for the production of ideas and creations

What is Wrong with This Story?

- ◆ Build a shoe-factory, face constant mc of using it: same story; why is this not an issue?
- ◆ Shoe factories have a capacity constraint – leads to a positive return
- ◆ transmission of ideas is similarly limited by scarcity of current set of people and/or products embodying the idea
- ◆ In the shoe factory case, capacity is chosen small enough that the competitive rent covers the cost of building the factory
- ◆ With ideas there is the problem of *indivisibility*
- ◆ Indivisibility has similar implications to fixed cost, but not the same

Diagrammatics of Capacity Constraints



Conventional wisdom ignores the impact of limited capacity

Ordinary Economics of Scarcity

- ◆ a new drug created by a team of (12) biomedical researcher over a period of time (1 year)
- ◆ at the end of the year the knowledge is *embodied in the researchers* (and possibly some of their writing) – no one can produce the drug unless the researchers tell them how to do it – no unpriced spillover here
- ◆ it is socially valuable to have other people know how to produce the drug
- ◆ for example: a second team of 12 expert biomedical researchers could set up a production line in Europe, while the original team sets up production in the U.S.
- ◆ transfer of knowledge is not costless – how long would it take them to explain to a group of inexpert economists how to produce the new drug? (huge literature on the problem of technology transfer...no mystery here)

two methods by which second team can obtain knowledge

- ◆ one: reinvent the wheel (1 year of team time)
- ◆ two: have the first team teach them (1 month of time for both teams, for example)
- ◆ second method minimizes team time (1 yr. 2 months), but production starts after 1 year 1 month
- ◆ first method: maximizes team time (2 yrs) but production starts after 1 year
- ◆ beginning production one month earlier has social value – this implies that the FIRST team can sell their knowledge into a competitive market and earns a **positive return** not zero as in the conventional story

The Problem of Competitive Innovation

"During the nineteenth century anyone was free in the United States to reprint a foreign publication, and yet American publishers found it profitable to make arrangements with English authors. Evidence before the 1876-8 Commission shows that English authors sometimes received more from the sale of their books by American publishers, where they had no copyright, than from their royalties in [England]" where they did have copyright.

Arnold Plant [1934] "The Economic Aspects of Copyright in Books," *Economica*, 167-195

But what happens when the internet replaces the clipper ship?

What is the impact of reduced distribution cost

Conventional wisdom suggests that in this case rents fall to zero, and competition must necessarily fail to produce innovations

Conventional wisdom fails for two reasons:

- The first mover advantage
- Although prices may drop, profits may increase

Quah 24/7 model: “music” reproduces at the rate $\beta > 1$ regardless of whether or not it is being used

rents accrue to holder of initial unit of music

$$\sum_{t=1}^{\infty} \delta^{t-1} \beta^{t-1} u'(\beta^{t-1})$$

Net impact of changes over time

- Uncertain effect of reduced distribution cost on profits
- Technological change greatly reducing the size of indivisibility
- Scale of the market greatly expanding

First Mover Advantages

- Secrecy
- Encryption (DRM)
- Reputation, customer loyalty
- Reward to anticipating stock market fluctuations (Ginger/Segway)
- Time and cost required for rivals to reverse engineer
- Alternative sources of income – live or theatrical performances for music and movies, paper books

The Size of Indivisibility

May not be relevant

- on the other hand, the social optimum might be such that saving a month in the start of production has social value exceeding a year of team time – in this case the costs of the first team are necessarily covered by the competitive rent
- the same technological change driving reduced distribution costs is greatly lowering the cost of production for movies and music

May be relevant

- it may be that (say) the team would have to produce $\frac{3}{4}$ of an idea to be able to recover costs – but this is not feasible because of indivisibility

Intellectual Property and the Scale of the Market

- ◆ growth reduces need for intellectual monopoly as it reduces the importance of the indivisibility
- ◆ even if we accept the conventional logic, expanding the scale of the market increases the incentive to innovate – the optimal policy is to reduce protection as the scale of the market expands
- ◆ world GDP has grown by a factor of nearly 100 since 1900
- ◆ WTO expands the market by nearly 50%
- ◆ the WTO, in exchange for expanding the number of countries enforcing patent and copyright protection, should agree to a reduction in the term of patent and copyright protection
- ◆ over the longer run as the global economy expands, patent and copyright protection should be phased out, as competitive rents alone will be able to do the job once the scale of market is large enough

Does Intellectual Monopoly Lead to More Innovation?

- Innovations generally build on existing goods, that is on earlier innovations – it is generally recognized that intellectual property protection has an undesirable effect on future innovation – Scotchmer (1991) for example
- Intellectual monopoly increases the rewards to innovation – but also the costs
- Examples where intellectual monopoly innovates strictly less than under competition
- James Watt refused for the 31 years of his monopoly to allow innovation in the steam engine
- the Wright brothers less successfully tried to do the same with the airplane
- Successful examples of thriving innovation with absence of patent in 19th Century: Switzerland, Netherlands

Overlapping Innovation: Is IPR the Solution?

consider a situation where each innovation creates the possibility of further innovation

many different producible qualities of capital, beginning with quality zero; capital of quality i denoted k^i

capital may be allocated to either consumption or investment

quality i capital yields γ^i units of consumption, where $\gamma > 1$ reflects the greater efficiency of higher quality capital

capital used in producing consumption depreciates at rate $1 - \zeta$

capital may be used to reproduce $\beta > 1$ units of itself or produce $\rho < \beta$ units of the next quality of capital

ρ technology subject to an indivisibility of \underline{h}

demand elastic then inelastic

when

- ◆ Indivisibility is small
- ◆ Depreciation is small
- ◆ Potential for growth is large
- ◆ Industry is mature

The indivisibility doesn't bind in competitive equilibrium = first best

Under IPR no innovation takes place at all

Intuition: capacity increasing versus cost decreasing innovation

The Holdup Problem

- ◆ Must use n different patented inventions to create a new invention
- ◆ Value of the new invention is private information to the inventor
- ◆ Under IPR as $n \rightarrow \infty$ probability of innovation goes to zero
- ◆ Without IPR as $n \rightarrow \infty$ probability of innovation bounded away from zero

Intuition: Chari/Jones; each individual patent holder does not take account of the negative impact his high price has on holders of related patents

Rent-Seeking

- ◆ Sony Bono copyright extension (20 years retroactive) and Eldred Case
- ◆ impact of DMCA on academic research and free speech
- ◆ efforts to legally mandate computer hardware to reduce copying (the computer industry is roughly an order of magnitude greater in size than the media industry being protected)
- ◆ delay in the introduction of the steam engine and of the airplane
- ◆ spread of AIDs in Africa
- ◆ submarine patents and legal blackmail – recently Eolas; SCO

Second best argument: we have to put up with all of this, because without IP there will not be any innovation, but as we have seen this is not the case

Distributional Issues

- ◆ monopoly profits shared as rents to scarce fixed factors
- ◆ example from copyright monopoly: actors, musicians

Goals of Public Policy

- Economic theory supports the view written in the U.S. Constitution copyright only in order to “promote the progress of science and the useful arts.”
- producers must be compensated for their work, or creative works will not be produced; economic theory shows that copyright and patents are not necessary for producers to be compensated
- economic theory does not argue that producers of intellectual property should be privileged over other producers unless there are social benefits to compensate for the costs of special treatment
- economics explicitly rejects the view of some artists, and the view widespread in Europe, that creators are uniquely entitled to control of copies their own creations.