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Do stronger patents limit the circulation of ideas?

Sudipto Bhattacharya Sergei Guriev

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Patenting has soared in recent decades, but much intermediate knowledge is protected by industrial secrecy, so relaxing patent protection must impact the secrecy option. Recent research suggests that the relationship between patent protection and knowledge transmission is hump-shaped and sector-specific. This suggests that patent protection standards should be sector-specific.

Has the protection of intellectual property rights (IPR) in the US and Europe gone too far? The changes in the last 30 years have extended patent protection to areas that have not been patentable before. The proponents of the reform praise the fact that the number of patents granted has tripled in the last 20 years and imply that the greater the number of patents, the more innovation, and hence faster economic growth. The critics point to the very same explosion in the patent numbers and suggest that these trends may actually be bad for innovation. Their main argument is that innovation is sequential. Unlike in Renaissance times, we now see very few Da Vincis who are able to develop finished products from scratch. Inventors and innovators use each other's ideas; in Isaac Newton's words, they stand on each other's shoulders. Therefore if too many ideas are protected by patents, and the patent holders' rights are too strong, it may be too costly and thus detrimental for other inventors' incentives, who need these ideas for further innovation.

This simple – and very realistic argument – shapes the major policy trade-off. Too little monopoly power for original inventors undermines their incentives to innovate; but too much protection of patents would stifle follow-up innovation and development of their ideas by users of their knowledge. The proponents of relaxing the IPR protection insist that modern innovation is becoming increasingly sequential/cumulative in its basic nature,

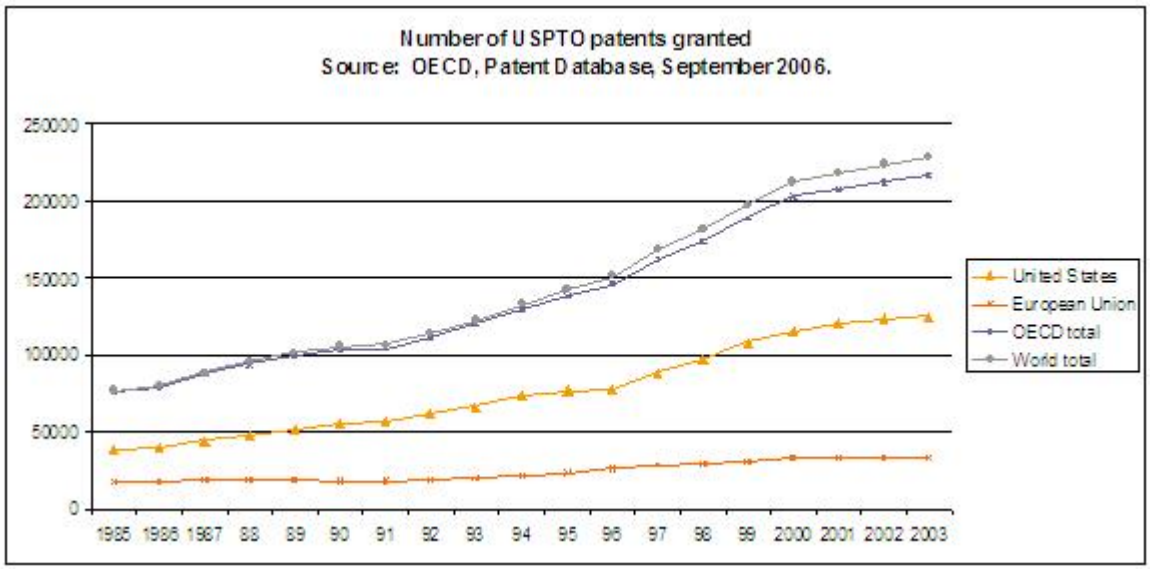
and that the circulation of ideas should now be freer from patents.

This argument has a certain merit, but it is also incomplete and may therefore be misleading. The policy debate should take into account the fact that a substantial share of ideas is transferred via trade secrets rather than through patent-based licensing. A survey of 1500 American R&D labs by Cohen, Nelson and Walsh[1] in 1994 showed that large firms actually rely on secrecy much more than on patents, though the extent of choice of one versus the other mechanism varies greatly across industries.

Once we account for the fact that firms can transfer knowledge through secrecy rather than patents, the effect of relaxing patent protection is markedly different. In our recent paper,[2] we model the endogenous choice between patents and trade secrets and study the effect of relaxing patent protection on disclosure of knowledge for follow-up innovators and social welfare. If patent protection is weak, the original inventors prefer to keep their knowledge private and use trade secrets rather than patents. Certainly, trade secrets are not a perfect mechanism; how can primary inventors commit to buyers of their ideas about the exclusivity of their trade-secret-based sales of knowledge? Usually, the buyer gives the seller of the knowledge final revenue-based royalties, that can rule out the seller's temptation to re-sell the idea to the buyer's competitor also. The problem is that the stronger the seller's incentives to keep the sale exclusive, the weaker incentives the buyer himself has to develop the idea purchased into a marketable (and patentable) invention – upon committing a certain share of final revenue to the inventor, the buyer is no longer a full residual claimant. This is why trade-secret-based sales of knowledge or ideas are not as efficient – in terms of the buyers' incentives – as patent-based ones. Yet, if patents do not guarantee full protection, contracting parties may still prefer relying on trade secrets. This may generate a surprising policy implication: if the policy is to increase circulation of ideas by relaxing IPR protection, the result may be very different. A weaker protection of IPR results in inventors choosing trade secrets over patents. This in turn reduces the stock of knowledge in the public domain for other inventors, decreasing social welfare, in the sense of social and inventors' surplus.

Empirical evidence on the relative importance of these countervailing effects is not yet available. But it is important to keep in mind that even when innovation is sequential, weaker intellectual property rights may result in less rather than more access of follow-up innovators developing early stage ideas further. In our paper, we show that one implication of these tradeoffs

is that, very often, bigger ideas (i.e. those that are more likely to lead to further inventions) would be licensed to next-round inventors using trade-secret-based licensing; indeed, the more valuable the idea, the stronger the royalty-based incentives. Thus, the relationship between the extent of protection of the ideas/knowledge via patents is non-monotonic. Moreover, we find that for such a relationship to be "hill-shaped" leading to an interior optimal degree of IPR protection as defined above, it is necessary that the primary inventors make endogenous and privately optimal choice across the two modes of selling their interim ideas. Otherwise, for example if (somehow) patenting of interim knowledge is made compulsory, the socially optimal level of IPR protection (to maximise inventors' surplus for incentive reasons) is either full or null; the former only if big ideas are very likely, and the latter when most interim ideas are small, with low probabilities of building on these for further inventions. Our analysis therefore implies that IPR protection policy should be sector-dependent.



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1 Cohen, Wesley M, Richard R. Nelson and John P. Walsh, (2000) "Protecting Their Intellectual Assets: Appropriability Conditions and Why U.S. Manufacturing Firms Patent (Or Not)." NBER Working Paper W7552.

2 Bhattacharya, Sudipto, and Sergei Guriev. "Knowledge disclosure, patents and the optimal organization of R&D". Journal of European Economic Association, December 2006. (CEPR DP 4513)

(below).

Topics: Productivity and Innovation

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