

Patents and the Transfer of Knowledge

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Overview

- How does the sale or transfer of patents help or hinder the market for knowledge?
 - patents as intangible assets
 - evidence on the operation of patent commons or exchanges in the clean/green technology area
- Conclusion
 - primary value of patents in some technologies is strategic
 - knowledge transfer via patents requires more to make the knowledge useful

Patents as assets

- Increased importance of intangibles increases demand for property rights to those assets.
- Startup firms in technology areas usually have relatively few tangible assets
- Primary assets are their ideas
- Property rights on those ideas should help secure financing
 - In principle, patent rights increase the salvage value of a firm that fails
- Is there evidence that patents assist financing?

US evidence (1)

- Hsu and Ziedonis (2008) - 370 venture-backed semiconductor firms
 - Doubling in patent application stock associated with a 28 percent boost in funding-round valuations.
 - Greater in earlier financing rounds and when funds are secured from prominent investors.
 - Larger patent stocks also increase likelihood of sourcing initial capital from prominent VCs and of achieving liquidity through an initial public offering.
- Mann and Sager (2007) – VC backed software firms
 - 25% acquire a patent
 - Firms that do get a patent experience better performance in terms of financing, survival, and exit status.

US evidence (2)

- Sichelman and Graham (2010) - large survey of startup and early-stage companies conducted in 2008
 - Biotech, medical instrument, software, internet, computer hardware
 - Response rate about 10 per cent, yielding 1000 companies
 - Rated financing and improving exit valuation as moderately to very important motives for obtaining patents.
 - Both cos & expert investors - patents more important for biotech and medical device firms than software and internet firms.
 - Nevertheless, about half of the experts found patents relevant for software and internet.

European evidence

- Haeussler et al. (2009) – German and British biotechs
 - European patent applications an important signal to VC investors
- Helmers and Rogers (2011) - all high and medium tech startups in the UK in 2000
 - Positive impact of UKIPO or EPO patent application in 2000/2001 on asset growth 2001-2005.
 - Uses a sample selection model to control for exit

Conclusion

- Patents help startups raise funds
 - Importance varies by sector
- Patents associated with better performance by these firms

BUT

- What is the source of increased funding and better performance?
 - The patent right – the asset?
 - Or the associated invention(s) for which the patent is a signal?

Salvage value

- Theory
 - Patented invention has potential value, even if firm that made it failed.
 - Potentially useful to another firm, possibly in conjunction with their own inventions
- Practice
 - Purchase by other established firms for defensive purposes
 - Purchase by a mass patent aggregator, used in litigation

The dark side?

- Exiting or unsuccessful firms frequently do try to monetize their patent holdings
- Hall & Ziedonis 2008 on litigation in semiconductors
 - Large R&D-doing firms more likely to be a target of patent lawsuits
 - Identify a surge in lawsuits filed by “non-rivals” and by “ex-rivals” such as Wang, Univac, etc.
- Recent high profile patent acquisitions mostly involve ICT, especially mobile telephony.
 - Patents in question typically held for defensive purposes rather than actually supplying an invention

Defensive purchase

- May 2011 – Google purchases Modu (failed maker of tiny phones) patents for \$4.7M
- June 2011 – Nortel’s 6000 patent portfolio purchased for \$4.5B by a consortium (Apple, EMC, Ericsson, Microsoft, RIM, Sony) – 750K/pat
- Aug 2011 - Google purchases Motorola Mobility for \$12.5B, primarily for 17.5K-25K patents (500K/pat)
- Aug 2011 – Kodak puts 1100 patents up for sale – est \$2B (1.8M/pat)
- Sep 2011 – Google purchases 1023 patents from IBM
- March 2012 – Facebook purchases 750 patents from IBM for “hundreds of millions” (~200K-500K per patent)
-and other such transactions

Mass patent aggregators

- Ewing & Feldman (2012)
<http://stlr.stanford.edu/pdf/feldman-giants-among-us.pdf>
- Intellectual Ventures
 - Founded in 2000; began massive accumulation of patents in 2004/2005
 - Raised \$5B in capital commitments from
 - Large tech companies
 - World Bank/ Hewlett Foundation
 - Universities
 - Structured as venture/private equity fund (tax reasons)
 - Estimated worldwide patent holdings 30K-60K, placing it in the top 20 firms globally

Why invest in IV?

- For some, diversification of financial portfolio
 - World Bank, foundations
- For others, a litigation defense insurance
 - E.g., Verizon paid \$350M for licenses and an equity stake
 - 2008 – TiVo sued Verizon for infringement
 - Verizon (one of the investors) purchased a patent from IV, counterclaimed against TiVo

Hidden threats?

- IV has 1000+ shell companies, mostly located in Nevada, Delaware at the same registration addresses
- 1000+ transactions acquiring patents
- Can be delays in registering patent reassignment when purchased, sometimes as long as 7 years
- Generally uses third parties to sue for infringement
 - began suing under its own name in Dec 2010
- So a potential licensor will not learn who to approach easily (*ex ante*)

Why is this successful?

- Most of the activity is in ICT, where
 - Independent invention common (Cotropia & Lemley 2009) – for non-pharma, 4.5% of wilful infringement complaints allege copying
 - Notice is weak, property rights vague (Bessen & Meurer 2010)
 - Discovery and search impossibly expensive due to lack of a way to organize ICT patents, esp. software (Mulligan & Lee 2012) – $O(n^2)$
- Net result – even if patent not an incentive for invention, it has the potential to earn rents from licensing or litigation settlement

An unanswered question

- Do the benefits of patents for entry and the creation of salvage value outweigh the transactions costs associated with the assertion of patents by exiting firms and by patent aggregators?
- Closely related to patent quality issues

Knowledge sharing via patents

- Two “experiments” in clean/green technologies:
 - Eco Patent Commons – created by IBM & others at the WBCSD
 - GreenXchange – created by Nike & others

GreenXchange

- Created **January 2010** by **Nike** with **~400** patents
 - Other participants are a very mixed group: Yahoo!, Best Buy, Creative Commons, IDEO, Mountain Equipment Co., nGenera, Outdoor Industry Association, salesforce.com, 2degrees
- Only **19** additional patents added (Best Buy and UC Berkeley)
- 3 types of license:
 - standard – a royalty-free license (like EcoPC)
 - standard plus – a license with restrictions/payment
 - research non-exempt – allows improvement and patenting for nonommercial use (designed for universities)
- BUT, in practice (on the website today) only 2 standard, 5 standard plus, 456 research licenses offered on website

Some lessons from GreenXchange

Source: Ghafele and O'Brien (ICTSD Policy Brief #13)

- traditional IP model very strong and hard to overcome
- many firms want access to people behind the patent rather than just the patent – importance of tacit knowledge
- limited resources – website is essentially useless for anyone who is interested in knowing what is available

The eco-patents commons

- Created **January 2008** by **IBM** at World Business Council For Sustainable Development (WBCSD)
- First **green** patent commons
- Firms can pledge patents related to green technology (defined by IPC subclasses, but flexible)
 - **11** firms have done so (from the “triad”), about **120** patents
- Available to third parties for climate-change related activities with auto royalty-free license
 - ownership remains with firm
 - not a donation, and not tax deductible
 - defensive termination right

IBM view

[P]ledging patents for free use by others [...] can be a win for innovators in other parts of the world, who might look at these ideas and further them and use them as the basis of additional solutions. And it can be a win for those who pledge because it could open up opportunities to collaborate with people that you might not otherwise have collaborated with.

(Wayne Balta, Vice President of Environmental Affairs, IBM)

That is, the patent helps you learn where and how to access relevant tacit knowledge for subsequent invention/innovation.

Summary of findings

- Green patents by OECD definition more likely to be pledged
- Pledged patents tend to be narrower
- Pledged patents appear to be less valuable than the typical patent in the class
- Pledged patents indistinguishable from the other patents in a firm's portfolio, except
 - they are more green
 - much less likely to match the IPC pattern of the firm, suggesting that they are not central to firm strategy
- Pledged patents just as likely to be kept in force

Knowledge transfer?

- Cannot tell whether inventions protected by pledged patents are used
- Look at diffusion by analysing whether patents are cited before and after donation
 - compared to subset of control(2) patents
- Conclusion: these patents are cited *less* before donation (and also after).
- Who cites them?
 - more likely to be individuals or non-profits/ universities (than cite the controls)
 - mostly developed country institutions & authorities

Conclusion

- The information in patents is freely available – that is part of the contract.
- However, making use of the information may require more than simple access to the patent, so the knowledge market often needs to include access to inventors or other information.
- In practice, the majority of patent trade does not seem to be for knowledge acquisition purposes, but for strategic or defense purposes.