Patents and the Financing of Innovation

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Patents as 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
  - Idenitfy 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?

- 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