

MTEI SEMINARS

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The Private Value of Patents for Entrepreneurial Ventures: Evidence from Medical Devices, Semiconductors, and Software

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Inspired by the seminal Teece (1986) framework, numerous innovation scholars have assessed whether patent protection enables companies to reap greater profits from innovation (Chesbrough et al. 2006). Causal linkages between patents and firm value nonetheless remain ambiguous in entrepreneurial-firm environments. Relative to their established counterparts, startups typically face tighter liquidity constraints in patent enforcement, which can diminish the economic and strategic value of their rights (Lanjouw and Schankerman 2001, Katila et al. 2008). Yet the profit-potential of technology startups is intimately tied to discoveries and know-how that patents aim to protect (Arora et al. 2001).

This study provides preliminary evidence on the private value of patents for 3,414 venture-backed U.S. companies founded between 1987 and 1999. We compare the magnitude of such value across three industrial sectors: medical devices, semiconductor devices, and computer software. These sectors provide useful contrasts and commonalities that illuminate linkages more difficult to discern in single-industry studies. Of particular importance, the U.S. legal regime governing the patentability of software-related inventions changed dramatically in the 1990s (Lerner and Zhu 2007, Hall and MacGarvie 2010), a time frame captured by our analysis. We use this technology-specific “regime shift” to test for changes in the private value of patents to entrepreneurial ventures, both within software and relative to the other two sectors.

Our preliminary evidence suggests that the private value of patents to entrepreneurial software companies climbed significantly in the wake of the 1990s legal rulings. (In contrast, Hall and MacGarvie (2010) report a far more tepid effect on publicly traded companies.) We interpret this evidence as consistent with the view that patents serve an economically meaningful role for software startups, a matter of hot contestation in both the academic and public policy communities.

Despite this disproportionate rise in the private value of patents in software, we further document that—following regime-shifts in the mid-1990s—the magnitude with which patents boost NPV estimates in software remains an order of magnitude lower than that in the other two sectors. Consistent with Graham et al. (2010), this evidence likely reflects

the natural limitations of patents as legal safeguards for software products relative to “hardware” like semiconductors and medical devices.

Finally, our findings challenge conventional wisdom that patent value is demarcated by broad industry categories—at least within entrepreneurial-firm environments. Based on evidence from VC-backed startups, we find that the profits attributable to patents are comparable and substantial in the two device-related sectors, even though one (medical devices) is in the Life Science industry and the other (semiconductor devices) is in IT. In contrast, we find statistically significant and enduring differences in the profit-potential of patents for startups in software and semiconductors, the two IT-related sectors. This empirical evidence has important implications for future research testing the effects of patent protection on entrepreneurial activity.

References

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When:

25 June 2013, 12h-13h30

Where:

[EPFL, Odyssea 4.03, VIP room](#)