Sequential Innovation and Patent Policy

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ABSTRACT

I use a model of sequential innovation under creative destruction to study how patent policy shapes the R&D investments dynamics. I find that investments are *non-stationary* and *increase* through time. R&D incentives are driven by the *incremental rent* that firms obtain from innovating. For entrants, this is simply the value of a new patent. For incumbents, the rent corresponds to the *difference* in value of a new patent and the the current one. This difference in incentives leads to asymmetric effects between incumbent and entrants. While a patent length extension increases entrants' R&D, incumbents decrease their effort as the value of their current patent increases relatively more to that of a new patent. I call this new effect the *protection effect*, and one of its main consequences is that the innovation rate may decrease due to an increase in patent length. This result contrast sharply with the previous literature and implies that there are additional consequences of a strong patent policy that have not being studied.

Incorporating the elements above, I study optimal patent policy and find that finite length and no leading breadth are, in general, optimal. Also, I relate optimal patent length to market arrival rate and I find that the optimal patent length is non monotonic with respect to the market arrival rate; markets that innovate fast and slow are associated with shorter patents relative to medium-pace markets.