

The Structure of IPR Regimes in the Presence of Cumulative Innovation *

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Abstract

Theories of technological diffusion and economic growth show the significance of IPR regimes in stimulating both innovation and knowledge spillovers. Provision of a temporary monopoly by legal means is offset by disclosure of technical know-how into the public domain, which stimulates new, and further innovation. In the large legal literature on the subject, contradictory arguments persist, and there are many proposals for alternative regimes to balance incentives for innovators against knowledge disclosure, meant to promote progress in various types of technologies. On one extreme, limited protection of intellectual assets enables rivals to render inventions easily, hence lowering the revenues of firms and their propensity to invest in R&D. Under-protective regime may lead to slower development of technologies and may hamper innovation in the long run. On the other extreme, over-protective regimes provide inventors with strong monopoly rights and dominance over broader shares of the technology and/or for longer periods. Patentholders are able to preempt other firms from developing and introducing products that fall into the scope of valid patents, thus enabling technological progress only in non-infringing features of the technology and hindering product differentiation.

The paper aims at identifying the optimal degrees of patent protection in terms of length and breadth that generate maximal scales of technological progress. We analyze innovation in goods that incrementally evolve by simulating a market of heterogeneous users and firms. The framework is used to determine relationships between different degrees of patent protection and market dynamics in cumulative innovation (quality, diffusion, market shares and growth). The choice variables define the main parameters of the legal regime: patent lifetime and the minimal inventive step necessary to protect new inventions. Implications of the model focus on the effects of extending the patent regime to include information technologies in its scope and suggest that the present legislation is over-protective and may slow down the evolution of software products and technologies in the long term.

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