

Do Firms Underinvest in Long-Term Research?*

Evidence from Cancer Clinical Trials

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ABSTRACT

This paper investigates whether private research investments are distorted away from long-term projects, by which we mean projects with long time lags between initial discovery (“invention”) and the availability of a commercially viable product (“commercialization”). We present a simple theoretical model to formalize two potential sources of this distortion: first, excess impatience of private firms relative to the social planner; and second, the fact that patents – as currently designed – provide little effective incentive to develop technologies with long commercialization lags. We then explore this distortion empirically in the context of cancer research, where clinical trials – and hence, commercialization lags – are shorter for drugs targeting late-stage cancer patients, relative to drugs targeting early-stage cancer patients or cancer prevention. Using a newly constructed data set on cancer clinical trial investments, we provide several sources of evidence which together are consistent with private research investments being distorted away from long-term projects. Back-of-the-envelope calculations suggest that the value of life-years at stake is large. We discuss three specific policy responses – surrogate (non-mortality) clinical trial endpoints, targeted R&D subsidies, and patent design – and provide empirical evidence that surrogate endpoints can be effective in practice.

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