

"R&D and Firm Heterogeneity"

Tetsugen Haruyama

This paper reconsiders a causal link between patent and other industrial policy on one hand and R&D expenditure on the other. For this end, we construct a patent race model with a particular emphasis on the role of firm entry, sunk costs and firm heterogeneity. In the model, there are three stages. In the first stage, there are N firms which do not know own R&D productivity before entry. Upon entry, R&D productivity is randomly drawn. In the second stage, given known R&D productivity, firms decide on whether or not to pay a sunk cost in order to stay in the race. In equilibrium some firms remain the race and others exit. After paying the sunk cost, firms incur flow costs which generate a Poisson arrival rate of innovation. In the third stage, a single winner emerges after innovation occurs and the winning firm gets a prize. In this framework, we have shown the possibility that a stronger patent protection discourages R&D activities.