Innovation Contests

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Abstract

We analyze the problem facing an organization that wishes to procure an innovation via the design of a contest among two identical and risk-neutral agents. The benefits, I, due to this innovation depend on its quality, q, and are given by I(q). The designer may discriminate among the two agents and offer different prizes depending on the identity of the winner.

The agents' types and choices of effort are private information. The quality q_N of the innovation produced by agent N depends on her type θ_N and choice of effort e_N, and is given by $q_N(\theta_N,e_N)=\theta_N+e_N$. Agents' types are independently distributed according to the same distribution function F(.).

The winner of the contest is the agent that offers the innovation of the highest quality. The designer specifies a prize R_A to agent A if she wins and a prize R_B to agent B were she to win, with $R_A \geq R_B$. The contest is non-discriminatory if $R_A=R_B$.

Given a contest (R_A,R_B), the payoff of agent N when she chooses effort e is R_N-e, in case she wins the contest and -e otherwise. The payoff to the designer is I(q)-R_M, where q is the quality of the innovation generated by the contest and M is the identity of the agent winning the contest.

We start by characterizing the agents' equilibrium strategies in non-discriminatory contests. We then use this characterization to determine the optimal non-discriminatory contest. Next we analyze the structure of equilibrium strategies and outcomes for discriminatory contests where $R_A>R_B$. We provide conditions under which a designer prefers a discriminatory contest, even though agents are symmetric. Finally we consider the case of sequential innovations.