Competitive Burnout in the Laboratory: Equilibrium Selection in a Two-Stage Sequential Elimination Game

C. Bram Cadsby
James Amegashie
Yang (Anna) Song

Department of Economics - University of Guelph

Abstract

Contests are an important fact and pervasive aspect of economic life. A contest is a game in which players compete over a prize by making irreversible outlays. Election campaigns, rent-seeking games, R & D races, competition for monopolies, litigation, wars, and sports are all examples of contests. A common feature of contests is that they involve multiple stages where the set of contestants is narrowed in successive stages of the contest until a winner is finally chosen. Another feature of contests is that the players may be constrained in terms of how much effort or outlay they can expend. In a sequential elimination contest with such a constraint, it may be rational for contestants to expend *all* their efforts in earlier stages, thus burning out and having nothing left to offer in subsequent stages.

We examine experimentally equilibrium selection in a two-stage sequential elimination contest in which a group of contestants competes to win a single prize. Only a subset of the participants survives the first stage. In the second stage, the survivors compete once more, with the winner taking home the prize. This game has a continuum of equilibria, many of which are Pareto-rankable, but only one of these equilibria satisfies the Coalition-Proof Nash Equilibrium (CPNE) refinement. That equilibrium involves "burning out" by using all of one's resources in the first stage. It is Pareto-dominated by many other equilibria.

We show that CPNE is not a good predictor of behavior when four people compete for two second-stage spots, but that it does predict well when eight people compete for the two available spots. Announcing the successful bids at the end of each stage has little impact on equilibrium selection.