Contest Architecture with Performance Revelation

Ernest K. Lai
Department of Economics
University of Pittsburgh
and
Alexander Matros
Department of Economics
University of Pittsburgh

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Abstract: We consider a two-stage elimination contest and ask how the revelation of the first-stage performance changes contestants' overall performance. First, we find a monotonic equilibrium. Second, we show that the revelation of the first-stage performance *always* increases the expected individual and total effort in the first round and decreases the expected individual and total effort in the second round.

Extended Abstract

Contests and tournaments are prevalent forms of competition in many social and economic contexts. Early literature focuses on comparisons between tournaments and optimal contracts (e.g., Lazear and Rosen, 1981; Green and Stokey, 1983; Nalebuff and Stiglitz, 1983). Recent research has shifted the attention to optimal contest design (e.g. Gradstein and Konrad, 1999; Moldovanu and Sela, 2001, 2006; Matros, 2005). In a recent paper, Moldovanu and Sela (2006) study the later where the question of optimal contest design is posted in terms of a choice between grand static contests and two-stage contests with elimination. They show that a two-stage contest in which contestants are divided into sub-contests in the first stage and the winners from these sub-contests compete against each other in the second stage gives a lower expected total effort than the single grand contest.

In this paper, we take the two-stage elimination contest as given and ask how the revelation of the first-stage performance changes contestants' overall performance. First, we find a monotonic equilibrium. Second, we show that the revelation of the first-stage performance *always* increases the expected individual and total effort in the first round and decreases the expected individual and total effort in the second round.

The details of our model is as follows. The competition technology in the contest is deterministic in which the contestant who exerts the highest effort wins with probability one. Contestants have private information about their costs of effort which can also be interpreted as their abilities. In the first stage of the contest, contestants are divided into groups. Each first-stage group winner receives a runner-up prize and the opportunity to advance to the second stage. The winner of the final (second) stage receives the main prize.

The new feature of our model is that, after the first stage, the contest designer reveals the effort levels exerted in the first stage by all contestants. Given this information, the finalists update their beliefs about their rivals' abilities and decide whether to compete in the second stage and if so how much effort to exert. In our setup, the contestants have incomplete information about other contestants' abilities in the first stage and, with the performance revelation (and a monotonic equilibrium), complete information in the final. We derive the monotonic equilibrium in the model.

Given the equilibrium, we are able to compare individual effort spending in our model with those in the set-up of Moldovanu and Sela (2006) where performance revelation is absent. It turns out that the first-round total expected effort is higher with the performance revelation. However, the second stage total expected effort is lower if the first-round performance is revealed. We conjecture, with the aid of numerical examples, that if the contest designer wants to maximize grand total expected effort, no revelation policy should be adopted.