Preemption in Rank-Order Tournaments

By Peter-J. Jost and Matthias Kräkel*

Abstract

- Rank-order tournaments are prevalent in sports as well as in hierarchical firms. The paper focuses on tournaments in which players choose their efforts sequentially instead of simultaneously.
- We show that the players' behavior in the sequential-move setting strictly differs from the behavior in the standard simultaneous-move one. First, players choose different effort levels even in the case of homogeneity, whereas in the simultaneous-move tournament homogeneous players always behave symmetrically.
- Second, under certain conditions the first-moving player chooses a preemptively high effort level so that the second mover drops out of the competition. In order to avoid such behavior, the organizer of the tournament should choose a rather moderate spread between winner and loser prize as best response.
- The analysis also points out that there may be either a first-mover or a second-mover advantage.
A. Introduction

In a rank-order tournament, players compete against each other in order to obtain prizes which have been fixed in advance. The player with the best performance gets the high winner prize, the second-best performer the second highest prize and so on. These tournament prizes can be either monetary ones (e.g. trophy money or advertising revenues) or symbolic ones like medals. Tournaments or contests can be found throughout sports and also inside firms. Examples for tournaments in sports are given by golf (Ehrenberg and Bognanno 1990), road racing (Lynch and Zax 2000), baseball and soccer (Hall et al. 2002). Examples for corporate tournaments are job-promotion tournaments (Baker et al. 1994), forced-ranking systems (Murphy 1992), sales contests (Mantrala et al. 2000) and relative compensation of managers (Antle and Smith 1986).

Typically, rank-order tournaments are modelled as simultaneous-move games (e.g., Lazear and Rosen 1981, Green and Stokey 1983, Nalebuff and Stiglitz 1983, Rosen 1986). However, in many real-world tournaments contestants do not choose their efforts completely simultaneously. On the contrary, players often decide sequentially, i.e. one player moves first and then the second-moving player, while having observed the effort choice of the first player, has to decide about his effort as a Stackelberg follower. Particularly, in many sports contests athletes decide sequentially and not simultaneously (e.g. golf, showjumping, broad jump, high jump). In corporate tournaments, workers also do not decide perfectly simultaneously in practice. For example, an employer may choose a relative performance evaluation among workers of the same department. This tournament lasts a certain time and can be best modelled as a sequential-move tournament with players observing their respective opponents. Another example is that of job-promotion tournaments. Here the employer may organize the tournament in a sequential way by revealing one worker’s performance to another worker.

Hence, in this paper we focus on sequential-move tournaments and the strategic implications for the contestants. In such sequential situations, the Stackelberg leader may benefit by choosing a preemptively high effort so that the second-moving player is completely discouraged and drops out of the competition by choosing zero effort. In our analysis, we will show that (1) under certain conditions the first-moving player indeed prefers preemption of the second-moving player, and (2) that the best response of the tournament organizer then is to choose a rather small prize spread to prevent such preemptive behavior. In other words, we argue that preemption is a typical problem in sequential-move tournaments with sufficiently high effort incentives, but the organizer’s natural response will then be the choice of a moderate prize spread in order to adjust incentives to an appropriate level. In the following, we will also show under which conditions players can realize a first-mover or a second-mover advantage.

There is some related literature that also deals with preemption in tournaments or contests. In the paper by Jost and Kräkel (2005) necessary conditions are characterized for preemption in sequential-move tournaments. However, no explicit equilibrium solutions are offered, neither for the players’ effort choices nor for the organizer’s choice of the prize structure. Leininger (1991), Leininger and Yang (1994), Baik (1998), and Weimann et al. (2000) consider the possibility of preemption in rent-seeking contests with linear costs and an exogenous winner prize. Since prizes are exogenously given, using prize adjustment as a solution cannot be discussed in their framework.