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Editorial

Advances in the Theory and Applications of Contests and Tournaments: Introduction to the Special Issue

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The theory of relative performance evaluation has come a long way since its inception, so much so that it is now a major research branch in economic theory. The initial focus of the literature was on ordinal tournaments, and subsequently shifted to cardinal tournaments and Tullock-type contests. The underlying premise under both tournaments and contests is relative performance evaluation. Tournaments and contests base reward to an agent on his performance relative to that of other agents. The foundational theory has been enriched by analyzing optimal relative performance evaluation mechanisms under different informational and financial constraints in static and dynamic settings, by issues related to heterogeneity and group formation, and by extensive behavioral economics issues, to name just a few domains.

I have been honored to edit or co-edit two Special Issues already [1,2], on tournaments, contests and relative performance evaluation, which were associated with international conferences held at North Carolina State University and at the University of California, Merced (See <http://contesttheory.org/>). This third special issue in the series aims at pushing the envelope forward. We encouraged the submission of papers underscoring recent advances in the theory and applications of cardinal and ordinal tournaments, along with Tullock-type contests. Building on established contributions as well as on the current momentum, we expressed interest in new, cutting-edge applications of tournament and contest theory, including behavioral and experimental economics applications. We received several submissions. All went through a standard refereeing process and seven papers were accepted for publication.

The paper by Sahm [3] studies the optimal design of a Tullock contest, with two players who have different prize valuations. The paper considers the case where the contest designer can choose the accuracy of the measurement technology used to determine the winner, and shows that the optimal accuracy depends on the objectives of the designer and the degree of heterogeneity of players. For instance, when the objective is to maximize the winning probability of the stronger player, the optimal accuracy is high. However, when the objective is to maximize the expected aggregate effort, the optimal accuracy is low and decreasing in the heterogeneity of prize valuations, which makes the contest outcome more uncertain and encourages both players to exert effort. The paper explores the practical implications of the results for the design of real-world contests, such as elections and sports.

Based on bounded rationality, in level- k models, agents behaving strategically see others as less sophisticated than themselves. The analysis of Arve and Serena [4] shows that the experimental evidence indicating overspending by contestants, compared to the theoretical Nash equilibrium outcome, can be rationalized in a standard level- k model, in parallel with overbidding in private-value auctions, which has already been shown to be rationalizable by level- k reasoning. Thus, the analysis bridges a gap between the contest and auction literature, offering an alternative explanation to overbidding in contests, provided that the number of agents is more than two or the agents are sufficiently asymmetric.

Cohen et al. [5] study two-sided matching contests in which two Tullock contests occur independently within two groups first and, then, the agents in both groups are assortatively



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matched according to their efforts until all the agents in the set with the smaller cardinality are matched. For instance, potential workers are matched with firms. Even though abilities are commonly known, the stochasticity of the Tullock contest success function implies that ability does not guarantee success in the matching contest, which distorts incentives. The analysis shows that by organizing assortative matching contests, the contest designer can ensure that independently of the form of the match value function (i.e., regardless of whether it is additive or multiplicative), a number of agents that is at least as large as the cardinality of the smaller set will exert effort.

It has been well-established in the literature that tournaments inherently invite sabotage. If an agent's reward is based on his performance relative to that of other agents, sabotaging the performance of other agents can improve the standing of any given agent. Glökler et al. [6] propose a mechanism to circumvent this issue for rank-order (or ordinal) tournaments. In the intuitive mechanism they propose, tournament prizes as well as their sum are variable, rather than predetermined, and they depend on joint output. In a classroom experiment with practical implications, they confirm their hypothesis that in a variable-prize tournament participants actually help each other, whereas in a fixed-prize tournament they sabotage each other, while effort levels remain invariant.

The paper by Dickson et al. [7] sheds light on the Tullock paradox, described as a price or cost of rent-seeking political favors that is far below the benefit, and reconciles it with the observed antithesis (i.e., over-dissipation of rents or over-exertion of effort) in experimental settings with small rents, by considering additively separable preferences in which the evaluation of the rent is not necessarily linear. The analysis differs from existing literature, which typically focuses on winner-take-all contests with indivisible rents, by also considering share contests in which the rent is divisible, and by allowing contestants to derive utility from the contest outcome in and of itself. The analysis shows that if contestants' evaluation of the outcome is sufficiently concave (i.e., with strongly diminishing marginal utility), both share and winner-take-all contests can exhibit over-dissipation of small rents and under-dissipation of large rents.

The article by Mathews et al. [8], motivated by professional golf tournaments, acknowledges the fact that agents often have a choice over the tournament in which they will compete, and examines the entry decision by agents in a multi-tournament setting, which can lead to pooling or separation of ability types based on parameter values. The paper differs from existing literature by treating the choice of prizes as endogenous, and by focusing on how the organizer market structure (monopsony or sequential competition) impacts the choice of prizes and the entry behavior of tournament participants who self-select, with high ability agents moving first. Interestingly, competition between organizers does not necessarily lead to a first mover advantage or to greater social welfare.

Dinopoulos et al. [9] focus on a novel application of contest theory. Specifically, they incorporate sequential, stochastic global innovation contests in a Schumpeterian growth model to analyze globalization's growth and distributional impact. In each innovation contest, challengers devote resources to R&D to discover higher-quality products. At the same time, incumbents undertake rent-protection activities (RPAs) to hinder the R&D effort of challengers and prolong their temporary monopoly power. Schumpeterian growth is a particular type of growth based on the process of creative destruction. The distributional impact of globalization is captured by the skill premium, which refers to the wage of high-skilled workers over the compensation of low-skilled workers. Globalization leads to the convergence of wages and growth rates. It is shown that the relationship between globalization and long-run growth depends on a country's relative skill abundance and the ranking of skill intensities between RPAs and R&D investments.

To conclude, the papers in this Special Issue reflect several of the directions taken by current research on the theory and applications of tournaments and contests. These papers advance our understanding of some key issues and provide applications which will, hopefully, stimulate future work.

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