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Strive to be first or avoid being last: An experiment on relative performance incentives

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ABSTRACT

We utilize a laboratory experiment to compare effort provision under optimal tournament contracts with different distributions of prizes which motivate agents to compete to be first, avoid being last, or both. We find that the combined tournament contract incorporating both incentives at the top and at the bottom induces the highest effort, especially in larger groups. Avoiding being last produces the lowest variance of effort and is more effective at motivating employees compared to competing for the top.

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1. Introduction

Managers in organizations have many motivational tools at their disposal. One popular such tool is the use of incentive schemes based on ordinal relative performance evaluations, or rank-order tournaments. A recent Wall Street Journal (WSJ) article states that at least 60% of Fortune 500 companies currently use some kind of a ranking system – both for top and bottom performing employees – for incentive provision.[1] The popularity of such mechanisms is largely due to an inherent structure present in most organizations, where only a limited number of promotions (or bonuses) or demotions exist. With

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[1] The article titled "'Rank and Yank' Retains Vocal Fans" was published on January 31, 2012 and can be accessed at http://online.wsj.com/article/SB10001424052970203363504577186970064375222.html.

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this natural limitation, managers must be selective in who receives the top and bottom prizes.[2] This selectivity motivates the employees to work harder to be the best or to avoid being the worst.

Given the prevalence of tournament-based incentive systems in organizations, it is no wonder that this topic has generated a magnitude of research (see for example, surveys by Konrad, 2009 and Dechenaux et al., 2012). However, most of the literature on rank-order tournaments focuses on understanding how participants compete for the top prize(s) and relatively little research has been done on the incentive schemes motivating participants to avoid being last. Given the presence of last place incentives in the workplace, the lack of research on this topic constitutes a gap in our understanding of organizations. For instance, the aforementioned WSJ article states that in addition to using a tournament mechanism to reward top performers, when Country Wide had to lay off employees, they first selected those who were ranked the lowest from prior evaluations. Though termination is the most severe consequence of being ranked last, it need not be the only one. It is often the case that lower ranked employees are demoted, assigned to less desirable tasks, have bonuses withheld, etc. Additionally, little research has been directed at understanding how participants behave in a tournament with more than two distinct prizes.[3] As evidenced by the multiple exchanges and heated discussions on the topic in the popular press, understanding these two key elements of organizational tournaments is paramount to the discussion of rank-order tournaments.

A clean identification of the incentive effects of tournaments is quite difficult, since data collected in the field usually allow one to observe only outcomes (e.g., total output). This is problematic since in most instances outcomes are a function of luck, noise, ability and endogenous selection as well as effort. Due to the difficulties in isolating the incentive effects, laboratory experiments have often been utilized as a way of giving more control to the researcher. A brief review of these experiments is given in Section 2. As already noted, the focus of experimental research has been mainly on competition for the top prize(s) or two distinct prizes.

The main contribution of this paper is in providing a detailed empirical comparison of tournament mechanisms involving competition for the top, competition to avoid the bottom, or both in a setting with efficient principal–agent contracts. Using the prominent framework of Lazear and Rosen (1981) we define three tournament mechanisms that differ in how rank-based prizes are allocated. A *winner tournament* is a mechanism where the agents compete to be first and one top prize is awarded to the agent with the highest output. Likewise, in a *loser tournament* the agents compete to avoid being last and one bottom prize is given to the agent with the lowest output. Finally, a *winner&loser tournament* is a combination of the two. For each of these mechanisms, we compute optimal principal–agent contracts that generate the same efficient levels of effort. We then parameterize the theoretical model and directly use the optimal contracts derived from it in a laboratory experiment, in which subjects in the role of employees choose effort levels (tied to a convex cost structure) and compete in one of the three mechanisms defined above.[4] Previous contest experiments documented substantial between- and within-subject heterogeneity and off-equilibrium behavior (for a review, see Sheremeta, 2013); therefore, we also introduce an alternative set of predictions using a Quantal Response Equilibrium (QRE; McKelvey and Palfrey, 1995) model in the Lazear–Rosen framework.

We also vary the size of the tournament, considering tournaments in groups of three and six agents. Varying the size of the tournament serves two primary purposes. First, tournaments in organizations vary in size. Understanding how the different mechanisms interact with the size of the tournament is relevant to forming generalizable recommendations. Second, varying the number of contestants in the tournament will help us to disentangle the underlying causes of the differences observed between mechanisms, and will also provide robustness to our results.

Our findings show that, in line with QRE predictions but not the Nash equilibrium predictions, the winner tournament is inferior to the other two in terms of effort. The existence of a top prize in the winner tournament encourages stiff competition for the top prize which, in turn, leads to a large number of subjects responding by choosing very low efforts – a finding which is consistent with the prior literature. In contrast, the mechanism which only includes a single bottom prize practically eliminates effort choices in the lowest range while simultaneously discouraging subjects from providing very high effort. These two findings lead naturally to our result that the mechanism which combines both a top prize and a bottom prize brings out the best of both effects and no other mechanism generates higher effort. Under this scheme, competition away from the bottom reduces the number of subjects who choose low effort, while the competition for the top provides continuous encouragement for some subjects to choose very high effort. Overall, the QRE model does better than the Nash equilibrium as it correctly predicts that the lowest effort and highest effort variance will occur in the winner tournament. The superiority of the winner&loser tournament, however, is not predicted by the basic model or the QRE model.

Given that some of the treatment differences are not predicted by the two models, we computed subjects' best responses and measured how far away each subject was from their best response and whether they improved over time. We find that in the winner tournaments, subjects were the furthest from their best response and, quite surprisingly, in contests of both sizes, they got worse over time. Even though subjects still did not best respond in the loser and winner&loser tournaments, there is no difference in the deviations from best response between these two mechanisms.

[2] As pointed out by Lazear and Rosen (1981), further reasons for the popularity of rank-order tournaments have to do with complications inherent in many organizations, which inhibit a manager from forming contracts on effort directly due to the difficulties in measuring actual output in a quantifiable way; the manager may also be willing to insure workers against common productivity shocks.

[3] This is the hallmark of Jack Welch's "differentiation" management strategy which has been widely adopted. For his defense of such a mechanism, see a recent piece by him at http://online.wsj.com/news/articles/SB10001424052702303789604579198281053673534.

[4] Note that the chosen effort design element was selected to better test the base theory.

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