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How tournament incentives affect asset markets: A comparison between winner-take-all tournaments and elimination contests

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ABSTRACT

We investigate the impact of investment managers' tournament incentives on investment strategies and market efficiency, distinguishing between winner-take-all tournaments (WTA), where a minority wins, and elimination contests (EC), where a majority wins. Theoretically, we show that investment managers play heterogeneous strategies in WTA and homogeneous strategies in EC, and markets are more prone to mispricing in WTA than in EC. Experimentally, we find that investment managers play more heterogeneous strategies in WTA than in EC, but this does not trigger significant differences in prices. Moreover, prices in WTA and EC do not differ significantly from markets composed of linearly incentivized subjects.

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1. Introduction

Rank-based incentive systems are prevalent in many organizations. Dutcher et al. (2015) report that at least 60% of Fortune 500 companies apply some form of ranking system not only to reward their top performers but also to “eliminate” their bottom performers.⁴ Although the body of research on tournaments is relatively large (see Dechenaux et al., 2015, for a

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⁴ See an article from the Wall Street Journal, retrieved July 28, 2016: <http://online.wsj.com/article/SB10001424052970203363504577186970064375222.html>.

recent survey), there is not much evidence on the differences in tournament effects between the “winner-take-all” and the “elimination” components.⁵

The finance sector is an example of an industry that applies tournament incentives in various forms. It is well documented that different investment managers in this industry, such as traders, investment bankers, mutual fund managers, and hedge fund managers, are exposed to tournament incentives (see, e.g., [Rajan, 2006](#)). Moreover, in the finance industry, both components, winner-take-all (WTA) and elimination contests (EC), are active at the same time. Being among the top of a ranking creates higher salaries because of investment managers' relative-performance compensation schemes ([Deli, 2002](#); [Ma et al., 2015](#)) and also produces higher chances of promotion. In contrast, falling on the bottom of a ranking increases the probability of demotion or job termination ([Khorana, 1996](#); [Chevalier and Ellison, 1999](#); [Qiu, 2003](#); [Kempf et al., 2009](#)). These tournament incentives may affect investment managers' risk-taking behavior and thus the risk-exposure of financial institutions and the stability of financial markets.⁶

In this paper, we investigate whether and how tournament incentives—tournaments of either WTA- or EC-type—of investment managers affect investment strategies and aggregate market outcomes. Since both components play a role simultaneously in practice, an empirical analysis of the impact of each component on financial markets is difficult. Instead, we take a theoretical and an experimental approach, which allows us to disentangle the two components and to investigate their impact on individual behavior and on market efficiency separately.

We contribute to the existing literature mainly by using both theory and experiment when investigating the impact of different tournament incentives on investment behavior and market outcomes. Previous theoretical and experimental studies commonly use only one of the two approaches.⁷ Combining both approaches produces a synergy. On the one hand, our static competitive market model allows us to uncover the underlying mechanism and to derive sharp theoretical implications based only on very few parameters, but it abstracts from bounded rationality of individuals and the complexity of the microstructure of real-world markets. On the other hand, our experimental asset markets enable us to incorporate the real-world trading mechanism and the dynamic interactions among boundedly rational traders into our analysis. By combining both approaches, we can compare the theoretical results with the experimental ones to learn to what extent our theoretical implications hold in a much more complex setting, to identify the factors that might contribute to the difference, and to provide implications that can be drawn from both approaches.

We first build a parsimonious model of a competitive market with a single risky asset. This asset produces a random terminal value, whose distribution is known to all traders. There are two types of traders in the market. The first type is *investment managers*. They have tournament incentives and aim to maximize the probability of winning the competition, i.e., the probability of outperforming a certain proportion of peer managers. The second type is *ordinary traders*. They have no tournament incentives and aim to maximize the terminal portfolio value.

Our theoretical model shows that, in WTA, in which a minority of investment managers win, managers generically follow heterogeneous strategies, with one group fully cashing into the risky asset and the other group fully cashing out. These aggressive strategies result in large trading volume. The equilibrium asset price is unique and weakly increases in managers' cash endowments. When managers have sufficiently large cash endowments, the equilibrium asset price exceeds the fundamental value, generating asset overpricing. In contrast, in EC, in which a majority of managers win, managers play the same strategy that need not be aggressive. There may exist multiple equilibrium prices, but the fundamental value is the unique equilibrium price that satisfies the security principle, an equilibrium selection principle based on the “riskiness” of an equilibrium following the concept of maximin introduced by [Von Neumann and Morgenstern \(1972\)](#).

Second, to complement our theoretical approach, which identifies tournament structure (WTA or EC) as a key determinant of investment behavior and market outcomes, we further investigate the effects of tournament incentives by running asset market experiments in the laboratory. Within a market, half of the experimental subjects act as investment managers, all of whom face the same tournament compensation scheme, and the other half act as ordinary traders receiving linear incentives. We use two tournament treatments, WTA, in which a minority of managers win, and EC, in which a majority of managers win. We also conduct a third treatment, LINEAR, where all subjects are ordinary traders. This treatment serves as a benchmark and allows us to relate our findings to previous experimental studies which typically concentrate on traders with linear incentives.

In the experiment, subjects' trading behavior is indeed affected by the tournament structure applied. First, we find that, in Treatment WTA, managers invest more in the risky asset and trade more compared to ordinary traders. In contrast, in Treatment EC, managers are more passive and trade less than ordinary traders. These results are, in general, consistent with the theoretical implications that managers play aggressive strategies to gain a chance of standing out in WTA, whereas they

⁵ [Dutcher et al. \(2015\)](#), for instance, investigate the impact of both components on work effort in the Lazear–Rosen type of tournaments ([Lazear and Rosen, 1981](#)).

⁶ See [Rajan \(2006\)](#) for a discussion of how tournament incentives for investment managers might lead to financial instability. See also [Allen and Gorton \(1993\)](#) and [Allen \(2001\)](#) for discussions of how other non-linear incentives for investment managers, such as convex compensation schemes, can create moral hazard problems and price inefficiencies.

⁷ One exception is [Agranov et al. \(2013\)](#), who also use both theory and laboratory experiment for their investigation of how the competition for fund inflows impacts risk-taking behavior of laboratory portfolio managers who are compensated with option-like incentives. One major difference between their study and ours is that they apply a principal–agent framework where the agents invest funds of their (laboratory) clients, whereas we abstract from the active role of the principal. A second major difference is that they study variants of option-like compensation schemes, whereas we focus on different tournament structures.

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