11-1-2016

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Comments

Working Paper 16-27

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November 1, 2016

Abstract

Tournaments are commonly used in the workplace to determine promotion, assign bonuses, and motivate personal development. Tournament-based contracts can be very effective in eliciting high effort, often outperforming other compensation contracts, but they can also have negative consequences for both managers and workers. The benefits and disadvantages of workplace tournaments have been identified in theoretical, empirical, and experimental research over the past several decades. Based on these findings, I provide suggestions and guidelines for when it might be beneficial to use tournaments in the workplace.

JEL Classifications: C7, C8, C9, J4, J7, L1, L2, M1, M5
Keywords: tournaments, contests, competition, contracts, workplace.

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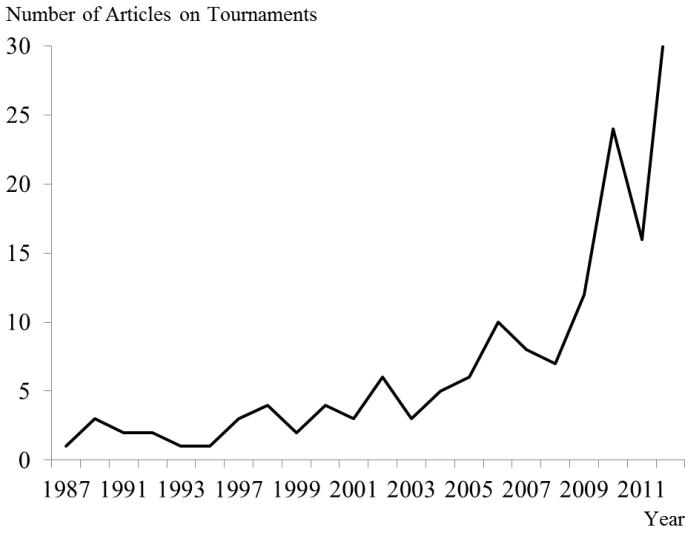
I want to thank an anonymous referee and the IZA World of Labor editors for many helpful suggestions on earlier drafts as well as Emmanuel Dechenaux, Shakun Mago, Will Masters, and Steve Wu for helpful comments. The usual disclaimers apply.

1. Introduction

In order to motivate workers, a manager must decide how to design a reward structure that elicits the highest possible performance from the workers. The manager can reward workers based on their relative performance (e.g., a rank-order tournament) or absolute performance (i.e., a piece-rate), or use a fixed-wage contract. In their seminal paper, Lazear and Rosen (1981) showed that when monitoring is expensive or unreliable, rank-order tournaments can outperform other compensation schemes, including piece-rate and fixed wage contracts. Considerable theoretical (Konrad, 2009; Vojnovic, 2016), empirical (Prendergast, 1999; Szymanski, 2003; Connelly et al., 2014), and experimental (Dechenaux et al., 2015) research has been done to investigate behavior in tournaments over the past several decades; see Figure 1 showing a dramatic increase in the number of published academic articles about tournaments in experimental economics over the last two decades. The purpose of this article is to review the pros and cons of workplace tournaments identified by the existing research and to advise practitioners on when and how to use tournaments in the workplace.

Figure 1: Time trend of articles on tournaments in academic journals.



Source: Dechenaux et al. (2015).

2. Discussion of pros and cons of tournaments

2.1. What is a tournament?

A tournament is a contest in which participants compete for prizes that are awarded based on relative rank. A key idea underlying the tournament theory is that a tournament designer (a manager) can evaluate the relative performance of contestants (workers) and, based on this performance, determine winners and losers (Konrad, 2009; Vojnovic, 2016). The most common objective of a tournament designer is to choose prizes that maximize the aggregate total performance from all contestants. If the prize spread (i.e., the difference between the winner's and loser's prize) is too small, contestants may not be sufficiently incentivized to produce high performance. However, a prize spread that is too high can also be detrimental because it may induce inefficient (i.e., very costly) competition.

The three canonical models of tournaments developed in the mid-1970s to early 1980s include the Tullock (1980) model of rent-seeking, the Lazear and Rosen (1981) rank-order tournament model, and the all-pay auction (Hirshleifer and Riley, 1978; Nalebuff and Stiglitz, 1983). Although the underlying assumptions of the three tournament models vary, all models assume that (i) contestants exert costly irreversible efforts while competing for prizes and (ii) an individual contestant's probability of winning the prize depends on the contestants' relative efforts and skills. The contestants' objective is to maximize their respective payoffs by choosing appropriate effort levels. Higher effort implies a higher probability of winning more valuable prizes, but it also implies a higher cost of effort. Therefore, a rational contestant will equalize the marginal benefit of effort (the additional benefit received from an incremental increase in effort) to the marginal cost of effort, given the behavior of the other contestants. In other words, contestants are expected to exert as much effort as necessary to win the tournament, so long as

the cost of that effort is not too high in their individual assessment, while considering the effort levels of other contestants.

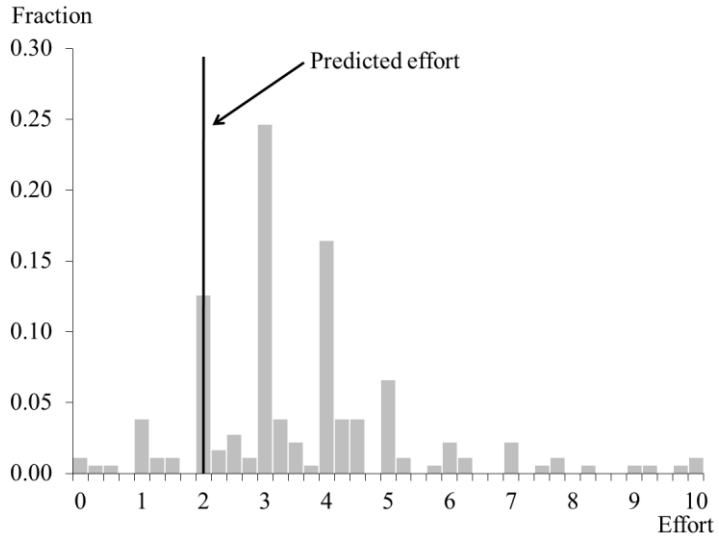
2.2. Tournaments as a tool to incentivize performance

Theoretical research shows that tournaments can be very powerful at incentivizing performance. Empirical studies in economics (Knoeber, 1989; Knoeber and Thurman, 1994), management (Brown et al., 2003) and sports (Ehrenberg and Bognanno, 1990; Becker and Huselid, 1992) show that tournament-like incentives increase individual performance of workers, managers and athletes. Experimental research shows that tournament incentives are even more powerful than predicted by the rational decision making model (Dechenaux et al., 2015).[1] A survey article by Sheremeta (2013) examining a sample of 30 contest experiments finds that the average participant effort level is 72% higher than predicted by the rational decision-making model. In some cases, the extent to which participants over-exert effort is so high that participants, on average, receive negative payoffs (Sheremeta and Zhang, 2010; Price and Sheremeta, 2011, 2015; Chowdhury et al., 2014; Mago et al., 2016). Figure 2 displays a distribution of effort levels commonly observed in tournament experiments. The data are taken from Sheremeta (2016). Almost 80% of participants exert higher than predicted effort, suggesting that tournaments create powerful competitive incentives motivating individuals to exert efforts well above the prediction of the rational decision making model.[2]

[1] Controlled experiments allow researchers to test theoretical predictions about tournaments without dealing with the confounding effects of self-selection and unobservable characteristics. Moreover, most experiments allow direct measurement of individual effort, while controlling for the relative abilities of individuals, as well as relevant parameters of interest (such as the number of players, the number of prizes, and the length of the tournament).

[2] Different theories have been offered to explain overly-competitive behavior in tournaments (Sheremeta, 2013, 2015a, 2015b), including the non-monetary incentives to win (Sheremeta, 2010; Cason et al., 2012, 2015), bounded rationality (Sheremeta, 2011; Lim et al., 2014; Chowdhury et al., 2014), relative payoff maximization (Fonseca, 2009; Mago et al., 2016), and impulsivity (Sheremeta, 2016).

Figure 2: Distribution of effort in a tournament experiment.



Source: Sheremeta (2016).

Besides providing pure monetary incentives, tournaments also provide non-monetary incentives. Research shows that people value winning itself, and enjoy the recognition provided by relative rankings. Sheremeta (2010) uses a simple laboratory experiment to show that more than 40% of individuals are willing to exert positive costly effort to win a tournament in which the winning prize is $0. Kosfeld and Neckermann (2011) use a field experiment to show that by simply honoring the best performance publically with a symbolic award, a manager may increase the average performance of individuals by 12%.[3]

2.3. Information and common shocks

Compared to other compensation schemes, tournaments may require less information for evaluation (Lazear and Rosen, 1981). For example, it may be easier to evaluate the relative

[3] Other studies show that tournament-like incentives can be effective in enhancing status (Chen et al., 2015, 2016; Clingingsmith and Sheremeta, 2015, 2016) and providing recognition (Samek and Sheremeta, 2014, 2016), which in turn leads to higher performance of individuals. These findings suggest that managers need not to impose a full-fledged tournament in order to reap some of the benefits of tournament-like incentives. Even under piece-rate and fixed wage contracts managers can increase workers' performance by announcing performance ranks (i.e., "salesman of the year," "employee of the month," etc.).

performance of individuals (which is needed to assign prizes in the tournament) than to measure the exact output of each individual (which is needed to make payments under the piece-rate system). When it is less costly to observe rank than an individual's level of output, tournaments may dominate piece-rates as they are less costly to implement while providing similar incentives.

Another important advantage of tournaments over alternative compensation schemes is that rank-order incentives are not affected by common shocks (Green and Stokey, 1982). There are always some shared risks at the workplace affecting the ability of many or all workers to complete certain tasks. Such risks can be individual-specific (e.g., individual trauma) or common (e.g., bad weather). The possibility of these types of shocks may discourage individuals from participating and exerting high enough effort (Rubin and Sheremeta, 2016). However, since common shocks do not change the relative ranking of workers' efforts, individuals may view tournaments as more attractive than other compensation schemes. Without the relative evaluation metrics found in tournaments, the evaluation of workers' performance under most other schemes will be negatively affected by common shocks, leading to potential negative impacts on workers' compensation. Indeed, experimental studies (Wu and Roe, 2005; Wu et al., 2006; Agranov and Tergiman, 2012) provide evidence that, in the presence of common shocks, tournaments outperform fixed wage and piece-rate contracts by eliciting higher effort levels.

2.4. Matching jobs and workers

Finally, tournaments play an important function of sorting workers to jobs. The main prediction from the theoretical literature is that more able individuals should sort into jobs offering higher potential returns (Rosen, 1982; Sattinger, 1993). This prediction has been supported by empirical studies (Szymanski, 2003) and experiments (Dechenaux et al., 2015).

Lynch and Zax (2000) and Maloney and McCormick (2000), for example, show that competitive runners with greater ability are more likely to choose tournaments with the greatest prize spread. Dohmen and Falk (2011) design an experiment in which participants can self-select into one of the four payment schemes, including the fixed wage, piece-rate, tournament, and revenue-sharing. The results of the experiment demonstrate that individuals systematically sort into different payment schemes. When the choice is between a fixed payment and a tournament, individuals are more likely to enter a tournament if they are more productive, less risk-averse, and more optimistic. Similarly, Niederle and Vesterlund (2007), Eriksson et al. (2009), and Cason et al. (2010) document that when choosing between different compensation schemes, more able and less risk-averse individuals prefer to enter tournaments. It is also well documented that less risk-averse individuals exert higher efforts in tournaments than more risk-averse individuals (Eriksson et al., 2009; Sheremeta, 2011; Shupp et al., 2013).[4]

In sum, tournament-like incentives can "kill two birds with one stone," as they both improve the allocation of talented workers to better-suited jobs and provide incentives to increase effort levels (Baker et al., 1988).

2.5. The flip side of tournaments

Despite many advantages, some negative consequences may arise when employing tournaments in the workplace. Perhaps the most obvious one is that tournaments create a large inequality of payoffs. In a book titled *The Winner-Take-All Society*, Frank and Cook (1996) argue that in the past years the economy became increasingly dominated by a stark win-or-lose structure of payoffs. Incentives in tournaments are structured exactly in such a way: some

[4] For further discussion on how risk-aversion impacts behavior in tournaments see Dechenaux et al. (2015).

winners are created at the expense of many losers. Therefore, by design, rank-order tournaments will produce highly unequal payoffs in the workplace.

Although tournaments create powerful competitive incentives, there are several disincentive effects that may arise when employing competitive compensation schemes. For example, it is well-established that when a group is composed of individuals with mixed abilities, tournaments may create a "discouragement effect," which describes how a lower ability individual often reduces his/her effort when competing against a higher ability individual. The "discouragement effect" has been shown to hold both in theory (Konrad, 2009; Vojnovic, 2016) and in the field (Connelly et al., 2014). Brown (2011), for example, finds that an average golf player performs worse when a superstar (such as Tiger Woods in his prime years) is present in the tournament. Similarly, Coffey and Maloney (2010) find that individuals put more effort when they perceive that there is a reasonable chance of winning, while Cason et al. (2010) find that lower ability individuals are less likely to enter the tournament at all, even when they would benefit from participating. The discouragement effect has also received substantial support from a large body of experimental research (Dechenaux et al., 2015), which includes competitive structures such as rank-order tournaments (Weigelt et al., 1989; Schotter and Weigelt, 1992), all-pay auctions (Davis and Reilly, 1998; Llorente-Saguer et al., 2016), lottery contests (Fonseca, 2009; Kimbrough et al., 2014), and real-effort tournaments (Cason et al., 2010; Gill and Prowse, 2012).[5] Together, these findings indicate that tournaments create substantial disincentive effects when individuals are of mixed abilities.

[5] The literature on dynamic tournaments has also provided evidence for the discouragement effect both in the field (Klumpp and Polborn, 2006) and in the lab (Deck and Sheremeta, 2012, 2016; Mago et al., 2013; Irfanoglu et al., 2015; Mago and Sheremeta, 2016).

2.6. Selfishness and unethical behavior

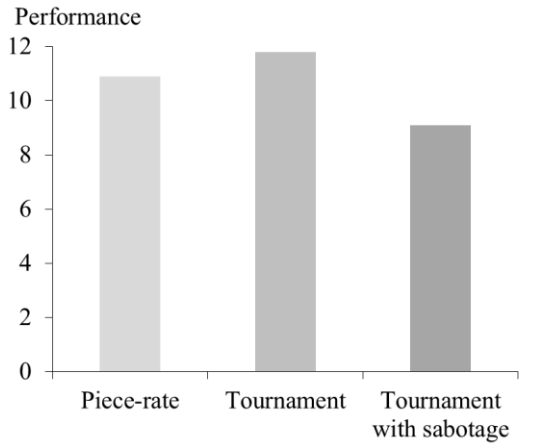
Another disincentive effect of tournaments is that individuals may view others as direct competitors, thus resulting in more selfish and less helpful behavior. Drago and Garvey (1997) use survey data from the Australian manufacturing sector to show that worker are unlikely to help their competitors (e.g., they are less likely to let others use their equipment, tools, or machinery) in the presence of strong promotion incentives (i.e., tournament-like incentives). Taylor (2006) uses an experiment to show that tournament incentives discourage knowledge sharing more than other incentive schemes.

In addition to disincentive effects, tournaments may encourage counterproductive behaviors. Preston and Szymanski (2003), for example, show that tournament incentives increase incidences of cheating by athletes in sports competitions. This is also true in the academic field (Heffernan, 2014), which has become dominated by tournament-like incentives. As a result, cheating, as measured by the retraction rates at *Nature*, have increased almost 10 fold in the past decade (Van Noorden, 2011).[6] Similarly, Schurr and Ritov (2016) find that winning a competition in a laboratory experiment leads to a more dishonest behavior. Other laboratory experiments show that individuals competing in tournaments often find ways to collude by exerting low efforts (Sutter and Strassmair, 2009; Cason et al., 2012; Kimbrough and Sheremeta, 2013, 2014; Kimbrough et al., 2014, 2015). Not only individuals are more likely to cheat and collude in tournaments, but they often take deliberate actions to reduce each other's performance (Chowdhury and Gürtler, 2015). This type of behavior may result in further negative emotional impacts on workers, though the effect of tournament-incentives on workers' emotional well-being has been understudied.

[6] The reason why the retraction rate is a good measure of cheating is that most retractions in academic journals are due to misconduct and plagiarism.

Carpenter et al. (2010) design an experiment in which participants engage in a clerical task of stacking envelopes. Participants privately evaluate each other's quantity and quality of performance in three treatments: (i) piece-rate, (ii) tournament, and (iii) tournament with sabotage. Figure 3 displays the performance of participants in these three treatments. The data are taken from Carpenter et al. (2010). When sabotage is not feasible, tournament outperforms piece-rate. However, when sabotage is feasible, the opposite is true.

Figure 3: Sabotage and performance in tournaments.



Source: Carpenter et al. (2010).

Finally, many field and laboratory studies find robust evidence that women are less likely to enter tournaments than men and that women do not perform as well as men in tournament settings (Croson and Gneezy, 2009; Niederle and Vesterlund, 2011). Although differences in risk preferences, overconfidence, and beliefs have been suggested as possible explanations for the gender gap in competitiveness, the main source and driving forces are still under debate (Dohmen and Falk, 2011; Dechenaux et al., 2015). Therefore, another potentially negative consequence of using tournament-like incentives in the workplace is that such incentives may discourage women from participating, even when women are more capable and have better skills than men (Niederle and Vesterlund, 2007). Having said that, some research (Mago et al., 2013;

Chen et al., 2015, 2016; Price and Sheremeta, 2015) shows that women may behave even more competitively than men in certain tournament settings (such as all-pay auctions and lottery contests).

3. Limitations and gaps

Over the past thirty years there has been a significant amount of research done on tournaments. Tournaments have been extensively studied by economic theorists in what has become known as the field of contest theory (Konrad, 2009; Vojnovic, 2016). The most important theoretical results have been tested with laboratory experiments (Dechenaux et al., 2015). Despite extensive and established theoretical and experimental literatures, much less effort has been devoted to study tournaments in the field. This limitation is a great opportunity for firms and researchers to work together in order to experiment and establish the best practices of using tournaments in the workplace.

Another limitation of the existing research on tournaments is that most studies focus on simplified environments in which individuals are assumed to work only on one type of task. In reality, however, individuals often work on multiple tasks. While some theoretical (Holmstrom and Milgrom, 1991; Baker, 1992), empirical (Helper et al., 2010), and experimental (Al-Ubaydli et al., 2015; Rubin et al., 2016) research has been done to investigate how individuals work on multiple tasks while facing piece-rate and fixed wage contracts, to the best of my knowledge, this issue has not been addressed in tournaments (Konrad, 2009; Laffont and Martimort, 2009; Vojnovic, 2016). This is a fruitful avenue for future investigation.

Finally, it is important to emphasize that much of the research discussed here is based on the assumption that interactions between managers and workers are “one-shot” and anonymous

(i.e., the manager hires an unknown worker to do a specific task only once), while in reality interactions are repeated and established on reputation. Although there is some theoretical (Konrad, 2009; Vojnovic, 2016) and experimental research (Dechenaux et al., 2015) addressing reputation and dynamic behavior in tournaments, this research does not compare alternative compensation schemes such as piece-rate and fixed-wage contracts. Again, this is a fruitful avenue for future investigation.

4. Summary and policy advice

Research has identified many advantages of using tournaments in the workplace. Not only do tournaments create powerful competitive incentives, motivating individuals to exert efforts well above predictions from the rational decision making model, but they also provide non-monetary incentives in the forms of recognition and winning. When compared to other compensation schemes, tournaments require less information about individual performance and they are less affected by common shocks. Therefore, one could be tempted to make a policy recommendation in favor of using tournament-like contracts in the workplace over other types of contracts. However, it is important to recognize that using highly competitive incentives comes with a cost. Rank-order tournaments create some winners at the expense of many losers, leading to a large inequality of payoffs and the discouragement of low skill workers. Tournaments also induce workers to engage in more selfish and less helpful behavior, as well as counterproductive behaviors such as cheating, sabotage, and collusion. Finally, tournament-like incentives may discourage women from participating, even when they are more capable and have better skills than men.

Academic research on tournaments suggests that managers should exercise caution when employing competitive compensation schemes, carefully weighing the pros and cons of instituting workplace tournaments to determine if the benefits exceed the costs. When deciding whether to employ tournament-like contracts, managers should carefully examine the following two things.

First, managers should carefully examine whether the workplace conditions are appropriate for using tournaments. For example, if a worker's output cannot be easily observed or measured then it could be easier to use tournament-like incentives rather than piece-rates (Agranov and Tergiman, 2012). Also, it could be a good idea to assign bonuses using a tournament structure when employees work independently and at different locations, so there is not much room for sabotage (Chowdhury and Gürtler, 2015). Similarly, tournaments could be used when workers perform independent tasks, making it difficult for them to collude. Conversely, tournaments may be less useful when the work tasks are more interrelated and when there is room for collusion (e.g., by purposely delaying the production process).

Second, managers should try to adjust the working conditions to mitigate potential negative consequences of using tournaments. For example, to mitigate the "discouragement effect," managers could level the playing field by handicapping more able workers or by using rules that favor less able workers. These types of policies have been shown to work both in theory (Che and Gale, 1998; Szech, 2015) and in practice (Schotter and Weigelt, 1992; Llorente-Saguer et al., 2016). Moreover, such policies can be successful at encouraging women (who are usually more susceptible to the discouragement effect) to participate in tournaments (Balafoutas and Sutter, 2012). If managers are concerned that using a stark win-or-lose structure of payoffs may demoralize some workers and create unnecessary competition in the workplace, they can

employ more equitable proportional prizes, i.e., prizes that are allocated proportionally to each worker's performance (Cason et al., 2010, 2013; Shupp et al., 2013), or tournaments with multiple prizes (Moldovanu and Sela, 2001; Müller and Schotter, 2010; Sheremeta, 2011), which still provide rank-order incentives but also decrease the associated payoff inequality.

In summary, before employing tournaments in the workplace, managers should assess the workplace environment and try to adjust the working conditions to be more suitable for using tournaments. Given the tradeoff between tournaments' pros and cons, managers should evaluate if the potential benefits of using tournaments outweigh the costs given their specific workplace contexts.

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