



The behaviour
of professional
weightlifters
offers lessons for
performance
management
within firms

Many areas of economic activity take the form of 'tournaments', where what matters is your performance relative to the performance of others. To assess the effects of such reward systems on participants' performance and the risks that they take, **Christos Genakos** and **Mario Pagliero** look at the behaviour of professional weightlifters.

Weightlifting competitions:

lessons for performance management

Think of the following situations: senior executives within a firm vying to be promoted to chief executive; pharmaceutical companies trying to be first to patent the cure for a disease; money managers trying to beat the market; track athletes competing in the Olympics. What is the common characteristic across all these activities?

Winning in all these different environments depends on participants' relative performance. In other words, it does not matter how good you are in absolute terms – for example, how fast you can run 100 metres – but whether you can run faster (even by a hundredth of a second) than your competitors.

What's more, the reward for winning is often substantial: the pharmaceutical firm that discovers a new drug can generate monopoly profits for the life of the patent; the manager of the fund with

the highest returns will not only be rewarded generously but his fund will also receive the majority of new investments; and the gold medallist will not only gain fame but more sponsorship than any other athlete.

There are many examples of such 'tournaments', where rewards are fixed in advance, concentrated at the top and based on relative rather than absolute performance.

Economic analysis of the incentives these tournaments create and their effects on participants' efforts indicates two outcomes. First, the bigger the prize for victory, the more effort the competitors put in; and second, in settings where there is a single winning prize, the prize awarded to the winner increases with the number of competitors (see Lazear and Rosen, 1981; Green and Stokey, 1983, and Nalebuff and Stiglitz, 1983). Evidence from both sports and corporate life broadly confirms these predictions.

OK on effort, but what about risk?

But in practice, competitors often do not only choose their effort: they also have to decide between more or less risky strategies. For example, a pharmaceutical firm that is lagging behind in a patent race may start exploring more risky projects; and a money manager with below market returns might start investing in more risky assets.

Taking a more risky strategy may have worse outcomes on average, but it may be the only hope a laggard has to win the competition. Whether it makes sense also depends on the options available to the leader, and on whether competitors can observe each other's strategies.

Unfortunately, economic theory offers ambiguous predictions about what happens when competitors are able to choose both their effort and the riskiness of their strategies. What's more, it is rarely possible to observe the risk and effort

decisions that participants take. How could we possibly know whether the senior executives in a firm are following a more or less risky strategy, or whether the athletes in a race are taking more or less risky actions?

Despite the importance of the issue, there is little empirical evidence on competitors' risk-taking, effort choices and performance in environments with tournament-like incentives. As a result, most of the evidence to date comes from laboratory experiments. Our research looks at non-experimental data from weightlifting competitions to examine professional athletes' choices about effort and risk-taking in a tournament setting.

Weightlifting, a sport where competitors attempt to lift heavy weights mounted on steel bars, has the unique characteristic that athletes have to announce in advance the amount they intend to lift. In other words, it is possible to observe not only whether athletes' efforts to lift a given weight are successful, but also, since attempting to lift a heavier weight is riskier, the strategy that they follow.

We analyse round-by-round data on the performance of professional weightlifters in international championships, including the Olympics, between 1990 and 2006. The panel dimension of our data allows us to control for multiple sources of unobserved heterogeneity at the athlete, competition or year level.

What's more, the multistage nature of the competitions allows us to estimate our parameters of interest simply by observing the behaviour of athletes during a given competition. For example, we can investigate whether a given athlete ranked first takes the same risks as when ranked eleventh, and whether the probability of a successful lift for a given weight is different for an athlete depending on his current rank in the tournament.

A lesson or two from the professionals

We establish two main results. First, risk-taking exhibits an inverted U-relationship with rank: risk-taking increases up to rank six and then monotonically decreases moving towards the bottom of the ranking. In other words, the same athlete will attempt to lift a heavier weight (0.8kg or 51% more than

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the average discretionary incremental announcement) if he is ranked sixth than if he is ranked first.

Although the athlete would be awarded a higher score if he were to lift the weight successfully, the chance of a successful lift decreases, indicating that he is willing to take more risk. In contrast, if the same athlete drops from being ranked sixth to eleventh, his attempted weight will decrease by 0.2kg (or 13% of the average discretionary incremental announcement), indicating that he is willing to take less risk.

Athletes try to protect their position with relatively safe strategies when leading the competition. Risk-taking is highest when there is a chance of winning a medal, and lowest towards the bottom of the ranking when the chances of reaching the top are slim.

The concentration of rewards at the top also suggests that tournaments with

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these characteristics encourage participants to take more risks overall. Indeed, we find that there is more risk-taking in more prestigious competitions like the Olympics, where the rewards are higher.

Second, we find that the probability of a successful lift, conditional on the chosen weight, increases moving down the rankings. In other words, an athlete has a lower probability of successfully lifting a given weight if he is ranked first than if he is ranked eleventh.

This is surprising. Given the structure of prizes, we would expect athletes to be more motivated and exert more effort when ranked near the top, where the reward for a successful lift is significantly higher, so that the probability of lifting a given weight increases when an athlete is higher ranked.

This finding suggests that athletes may perform badly under pressure, even though motivation and effort may be high. Such an interpretation is consistent with anecdotal evidence that athletes' performance may indeed deteriorate when the importance of a successful lift increases – a phenomenon known as 'choking under pressure'.

We show that athletes do 'choke' more frequently in more prestigious competitions or when the competition becomes tougher (in the sense that there are more athletes with similar performance). We also find evidence that 'choking under pressure' affects both experienced athletes (those who have already won a medal or previously participated in international competitions) and inexperienced athletes. This is in sharp contrast to previous research in behavioural economics, which highlights the importance of experience in overcoming psychological biases.

Finally, we contribute to the broader debate on tournaments by measuring the impact of a counterfactual reward system. Specifically, we consider a piece-rate contract, in which each athlete is rewarded at each stage in proportion to the overall amount successfully lifted. This is similar to many workplaces, in which workers are paid based on their absolute performance.

Our analysis reveals that tournaments encourage more risk-taking than this linear reward scheme. If a piece-rate system were used in weightlifting, athletes



Relative performance evaluation schemes may induce the phenomenon of 'choking under pressure', lowering overall performance

would attempt to lift smaller weights and they would succeed with higher probability. On average, the incentives provided by the tournament decrease the overall total of successful lifts, but it increases the probability of some outstanding performances (which may be what the spectators want to see).

Careful with those bonuses...

Nobel laureate Joseph Stiglitz has blamed the 'unconscionable' system of generous bonuses paid to investment bankers for exacerbating the global credit crisis: 'The system of compensation almost surely contributed in an important way to the crisis. The system was designed to encourage risk-taking – but it encouraged excessive risk-taking. In effect, it paid them to gamble.'

Overall, our findings suggest that tournament-like incentives – such as promotions and bonuses – can change workers' behaviour and could be a powerful tool in the hands of capable managers. Individual workers are typically more risk-averse than large corporations: since they typically only have one job, it is understandable that they do not want to risk it. Managers may use tournaments to induce risk-averse workers to innovate, experiment and ultimately take risky – but profitable – strategies.

On the other hand, our results show that tournaments can be too successful in encouraging risk-taking, leading to excessive risk and lower average performance. While this may be ideal in sport, in which suspense and extraordinary performances are what the spectators want, it may not be so desirable within firms. If firm profitability is affected more by average performance than by the rare exceptional performance of a few individuals, then tournament-like incentives may encourage unconscionable risk and reduce overall performance.

This article summarises 'Risk Taking and Performance in Multistage Tournaments: Evidence from Weightlifting Competitions' by Christos Genakos and Mario Pagliero, CEP Working Paper No. 1656.

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Further reading

Edward Lazear and Sherwin Rosen (1981) 'Rank-order Tournaments as Optimum Labor Contracts', *Journal of Political Economy* 89(5).

Jerry Green and Nancy Stokey (1983) 'A Comparison of Tournaments and Contracts', *Journal of Political Economy* 91(3).

Barry Nalebuff and Joseph Stiglitz (1983) 'Prizes and Incentives: Towards a General Theory of Compensation and Competition', *Bell Journal of Economics* 14(1).