

Contests: What's the use?

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NASEM: The role of inducement prizes
May 29th, 2019

Contests are widespread

- ▶ Job market tournaments, political campaigns, lobbying, litigation, employee-of-the-month awards, R&D races, internet coding competitions, sporting events, advertising, grant competitions

Relative performance reward scheme

- ▶ Economic agents make costly investments with the hopes of receiving a valuable and scarce prize

My background: Contest theory + experimental tests of theory

Today, let's focus on these questions:

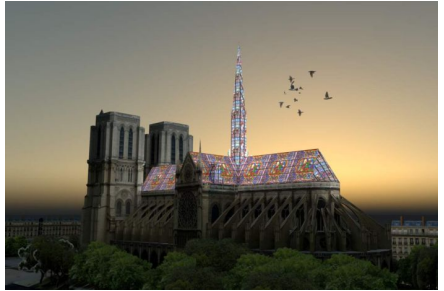
1. Why use a contest in the first place, i.e., advantages?
2. What are some disadvantages?
3. Which aspects of contest design require further exploration?

Interesting design and innovation contests



Left: Brunelleschi's innovative dome of the Florence Cathedral

(credit: Petar Milosevic)



Right: Rebuilding parts of the Notre Dame Cathedral

(credit: Alexandre Fantozzi)

1. Why use a contest in the first place, i.e., advantages?

Beginning: Theoretical explorations in the context of organizational/personnel economics

(Lazear and Rosen, 1981; Nalebuff and Stiglitz, 1983; Green and Stokey, 1983)

How should we incentivize high efforts in the workplace?

- ▶ Flat wage, piece-rate pay, tournament/contest, other?

In many cases, theory predicts that tournaments (T) can elicit efforts analogous to piece-rates (PR); can be optimal

- ▶ **Experimental evidence:** Effort under T $\sim$ PR, but higher variance under T (Bull, Schottner and Weigelt, 1987)

Strengths

- ▶ How to reward effort when effort is difficult or impossible to observe?
- ▶ Relative performance rankings are easier to construct
- ▶ Immune to common shocks

1. Why use a contest in the first place, i.e., advantages?

Innovation contests: Often times the objective is to find a high-quality solution to a difficult problem

- ▶ Cutting edge algorithms, efficient energy sources, innovative designs
- ▶ As in the labor context, how should this be done?

High-quality solutions

- ▶ Compared to internal innovation, contests can be cost effective and generate better solutions (NASA ISS Longeron challenge on Topcoder)
- ▶ Interesting trade-offs: Increased competition is not always detrimental to high-quality output (Boudreau, Lacetera and Lakhani, 2011)

Diverse set of solutions

- ▶ Theory and experiments confirm that open innovation can increase diversity in the solution landscape
- ▶ May be complementaries in solutions, making diversity key

Tournaments have a well-defined end

- ▶ Mandating new innovations is a good idea, but explicitly holding competitions can “get the ball rolling”

2. What are some disadvantages?

Unethical behavior

- ▶ **Sabotage:** Under tournament incentives, Harbring and Irlenbusch (2011) find that both effort and sabotage increase in the wage spread
- ▶ **Cheating:** Doping in sports (Kräckel, 2007; Ryvkin, 2013)

Greater dispersion of effort

- ▶ Observed in almost all experiments (Dechenaux, Kovenock and Sheremeta, 2015)
- ▶ Not necessarily a disadvantage; depends on objective

Lack of cooperative behavior

- ▶ Perhaps innovation requires a mixture of both competitive pressure *and* cooperative efforts
- ▶ Interesting area for future research

Excessive risk-taking

- ▶ Can be beneficial to individual payoffs, but high variance
- ▶ Although, risk-taking can be more frequent under absolute performance incentives; depends on environmental feedback

(Brookins, Brown and Ryvkin, 2016)

3. Which aspects of contest design require further exploration?

Well, pretty much all aspects require more attention

- ▶ Theory and empirical evidence!

Better connection between theoretical and empirical literature

- ▶ Which model assumptions are too strict?
- ▶ Are some characteristics needed, i.e., is behavior as sensitive to characteristics as predicted?

Need to pay attention to the objective

- ▶ Maximize sum of all output? Or, maximize expected highest output?

(Terwiesch and Xu, 2008)

- ▶ How does this change the predictions?

3. Which aspects of contest design require further exploration?

Intertemporal prizes (Klein and Schmutzler, 2017)

- ▶ \$1 million dollar Netflix Prize had progress prizes

How many prizes? (Moldovanu and Sela, 2001)

Information disclosure

- ▶ Disclosing the number of contestants may increase investment
(Boosey, Brookins and Ryvkin, 2019)
- ▶ Should we use full feedback across time? Maybe not.
(Jiang et al., 2016)
- ▶ Seed pseudo solutions?
(Ongoing research at LISH)

Contests with “reimbursements”

- ▶ Fixed and variable costs can be overwhelming, may inhibit entry and high investment
- ▶ Boeing and Lockheed Martin Joint Strike Fighter contract
- ▶ Optimal configuration of reimbursements? Who to reimburse?
(Matros and Armanios, 2009)

Thank you!

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