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May 2010
The
Equivalence of
Contests

CCP Policy Briefing

The Equivalence of Contests

BACKGROUND

- Economic and social interactions in which players expend costly resources in order to win a prize are often portrayed as *contests*. Examples include litigation contests and patent races.

- The standard model of a contest is provided by Tullock. In a Tullock-lottery contest, the resources expended by players determine their probability of winning a prize: the more effort expended by a player, the more likely he/she is to receive the prize; and the more effort expended by other players, the less likely he/she is to receive the prize. The amount of effort can be thought of as equivalent to the number of lottery tickets held. The contest designer draws one ticket from those entered by all the players and assigns the prize to the one whose ticket came out of the draw.

- A number of studies have investigated different aspects of contests, such as the interdependency between prizes and resource expenditures, endogenous prize valuation, and the effect of spillovers.

- Some studies have established links between different families of contests, such as all-pay auctions, rent-seeking contests, and rank-order tournaments.

METHODOLOGY

- The authors employ a Tullock-type contest model and consider a two-player contest, where outcome-contingent payoffs are linear functions of prizes, own effort, and the effort of the rival.

- Under this structure, a two-step procedure is employed to identify strategically equivalent contests that generate the same family of best response functions and, as a result, the same equilibrium effort expenditures and the same revenue.

KEY FINDINGS

- The main finding of this paper is conceptually different from the findings of previous studies. The authors show that even within the same family of Tullock-type contests, different types of contest might produce the same best response functions and the same revenue. The equivalence between contests is important because it demonstrates that different contests can be used to achieve the same objective.

- The authors also show that two strategically equivalent contests may yield different equilibrium payoffs. Hence, a contest designer has the option to choose between contests that elicit the same equilibrium rent dissipation, but have different Pareto ranking.

POLICY ISSUES

- Findings have implications for a contest designer, such as the government, as follows:

    (i) If a simple contest generates the same revenue as a more complicated contest, then the administrator can reduce operational cost by replacing the more complicated contest with a simpler equivalent contest.

    (ii) A contest designer seeking Pareto improvement may choose a contest that generates the same revenue, incurs the same cost, but results in higher expected payoffs for contestants.

    (iii) It is possible that, although equivalent, two contests can be affected differently by factors such as risk aversion, loss aversion, or joy of winning. Therefore, one contest may be preferred over another based on the importance of these external factors.

(iv) Certain contests may not be feasible to implement in the field due to regulatory restrictions, or due to the possibility of collusion among contestants. However, such restrictions may not apply to other equivalent contests.

THE CCP

The ESRC Centre for Competition Policy (CCP), at the University of East Anglia, undertakes competition policy research, incorporating economic, legal, management and political science perspectives, that has real-world policy relevance without compromising academic rigour.

FOR MORE INFORMATION

The full working paper (10-5) and more information about CCP and its research is available from our website: www.uea.ac.uk/ccp

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