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Pure redistribution and the provision of public goods

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Abstract

We show that a simple redistribution scheme can increase the provision of public goods and that the scheme is popular. This suggests that imposed redistribution as in the mechanism by Falkinger [Falkinger, J., 1996. Efficient private provision of public goods when deviations from average are rewarded. Journal of Public Economics 62, 413–22] appeals to intuitive notions of fairness.

Keywords: Experiment; Public goods; Redistribution

JEL classification: C9; H41

1. Introduction

This paper provides an experimental test of the effects of pure redistribution on the provision of public goods. Experimental subjects play a two-stage game. The first stage is the standard linear public goods game. In the second stage, subjects can redistribute payoffs among other subjects in their group, thereby simultaneously rewarding one subject and sanctioning another subject within their group. In the experiment we require that redistribution is budget neutral, i.e. that what is taken from one player must be given to another player. As a consequence, redistribution is costless for society. Moreover, redistribution is a low-cost choice in the sense that it entails no direct material cost or benefit for the decision maker.

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We find that pure redistribution strongly improves cooperation. In particular, contributions to the public good are more than three times as high (76%) with the redistribution option than in a control treatment without the option to redistribute (22%). We find that subjects use redistribution systematically to punish free riders and reward cooperators. Finally, we show that the option to redistribute is not only efficient, it is also popular. Subjects seem to anticipate the beneficial effects of pure redistribution. When asked to vote on the introduction of the redistribution scheme, 85% of all groups approve of redistribution.

Our study relates to Falkinger (1996) who suggested that redistribution may improve cooperation in the provision of public goods. In particular, Falkinger proposed an exogenously imposed, budget-neutral redistributive mechanism that subsidizes (i.e. rewards) above-average contributions and taxes (i.e. sanctions) below-average contributions. The tax/subsidy-rate is chosen to make contributions incentive compatible. In laboratory tests, this mechanism has been shown to sustain almost full cooperation (Falkinger et al., 2000). Our results suggest that the basic building block of the Falkinger mechanism, viz. simultaneous rewarding and sanctioning, appeals to widely held fairness concerns.

2. Experimental design

The experiment has two phases with 5 periods each. In phase 1, subjects play a standard linear public goods game in groups of 3 players. Subjects simultaneously decide how much of 20 endowment points to keep or invest into the public good in each period. Payoffs are determined by $\pi_i = 20 - c_i + 0.5\sum_j c_j$, where c_i is subject i's contribution to the public good, and 0.5 is the marginal per-capita return of contributing to the public good.

The contribution stage is followed by a redistribution stage. In this stage, the contributions of each subject in the first stage are anonymously revealed and each subject can redistribute a maximum of 6 points between the other two subjects in the group. Redistribution is budget-neutral, i.e., the points the decision maker takes from one subject have to be transferred to the other subject in the group. Subject i's payoff now is $\pi_i = 20 - c_i + 0.5\sum_j c_j + \sum_{i \neq j} r_j$, where r_j denotes the points received from or taken by the other two group members. Because each subject can redistribute at most six points and because there are two other group members for every subject within a group, $\sum_{i \neq j} r_j$ is in the range of -12 to 12.

3. Predictions

We know from previous research that people systematically use costly sanctions to punish free riders, and that these sanctions induce higher levels of cooperation (Fehr and Gächter, 2000). We also know that people are willing to reward cooperative behavior of others even if it is costly to them (Sefton et al., 2002). In one-shot games this behavior suggests that people have a willingness to pay for expressing social preferences, ethical values, or emotions. In our experiment, the decision to redistribute points between others is costless to the decision maker and it is therefore likely that people will make extensive use of "expressive" redistribution.

To illustrate the possible consequences of expressive redistribution, suppose that all subjects hold the belief that everyone in the group will redistribute the maximum of 6 points from low contributors to high contributors for any difference in contributions between other subjects in the group. Such a belief sustains the social optimum of full cooperation as an equilibrium because subjects always have an incentive to contribute marginally more than others, ratcheting contributions up to the maximum level. Of course, different sets of