An Experimental and Computational Analysis of the Public Goods Dilemma

Abstract

A social dilemma is a complex social phenomenon in which there is a conflict between rational individual interest and collective interest. The public goods dilemma is one of the most renowned social dilemmas. This thesis focuses on examining voluntary contributions towards the funding of a public good. Results from human-subject experiments reveal a decline in contributions towards a public good with repetition. This decline has been attributed to many factors including the presence of agents with heterogeneous preferences. This research examines the role of heterogeneous agents in the study of public goods using the voluntary contribution mechanism. A human-subject experiment was conducted to classify agent types and determine their effects on contribution levels. Results from the experiment show that there are three main types of agents: free-riders, conditional cooperators and triangular contributors. Data from the experiment was used to build and calibrate an agent-based simulation model. The simulations display how different agent types affect the contribution levels. Findings indicate that conditional cooperation and the norms of reciprocity are an important determinant of a population's contribution pattern. The current simulation model can be used as a building block of a more developed and inclusive platform for studying the different scopes of the public goods problem.

Keywords: Social dilemma – public goods – heterogeneous agents – simulation model – human subjects experiment

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