The Possibility of Efficient Provision of a Public Good in Voluntary Participation Games*

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Abstract

In this study, we examine the allocative efficiency of Nash equilibria in a voluntary participation game in which a public good is provided in units of non-negative integers. We show that the participation game has a Nash equilibrium that supports an efficient allocation and that some Nash equilibria are strong equilibria if at most one unit of the public good can be provided. However, the Nash equilibria of the participation game do not necessarily support efficient allocations if up to two units of the public good can be provided. We investigate the possibility of attaining efficient allocations at Nash equilibria in the case in which at most two units of the public good can be produced. We prove that Nash equilibria are less likely to support efficient allocations if the participation of many agents is needed for the efficient provision of the public good in the case of identical agents.

Keywords: Participation game, Nash equilibrium, Efficiency, Public project, Multi-unit public good, Diminishing rate of marginal benefits.

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