Existence, Uniqueness, and Algorithm for Identifying Free-Riders in Multiple Public Good Games: Replacement Function Approach

Kenichi Suzuki[*]   Jun-ichi Itaya[†]   Akitomo Yamanashi[‡]
Tatsuyoshi Miyakoshi[§]

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Abstract

This paper shows uniqueness of Nash equilibrium in the model of multiple voluntarily supplied public goods with potential contributors possessing different Cobb-Douglas preferences. This paper provides a sufficient condition for uniqueness using Graph Theory. This sufficient condition also allows us to use the replacement function approach of Cornes and Hatley (2007) not only to develop an algorithm for identifying free riders, but also to provide an alternative proof for the uniqueness of a Nash equilibrium in multiple public goods models.

Keywords: public good; voluntary provision; uniqueness, aggregate game; Nash equilibrium; algorithm

JEL classifications:: H41; F13; D01

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[*]Graduate School of Economics and Management, Tohoku University, Sendai, 980-8576, Japan. Tel:+81-22-795-6265; E-mail: Ksuzuki@econ.tohoku.ac.jp

[†]Corresponding author: Graduate School of Economics and Business, Hokkaido University, Sapporo, 060-0809, Japan. Tel:+81-11-706-2858; Fax:+81-11-706-4947; E-mail: itaya@econ.hokudai.ac.jp

[‡]Graduate School of Economics and Business, Hokkaido University, Sapporo, 060-0809, Japan. E-mail: shanlixianyou@gmail.com

[§]Faculty of Science and Engineering, Hosei University, Tokyo, 184-8584, Japan. Tel:+81-42-387-6352; E-mail: miyakoshi@hosei.ac.jp