

The Core Coincides with Nucleolus Allocations in a Public Goods Economy with Taxation

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Abstract

This paper studies a public goods economy with a certain tax system to finance public goods, involving multiple public goods and a private good called money.

In this economy, coalitions are allowed to improve upon a current allocation within their initial endowments and the tax revenue levied upon the complementary coalition according to the tax system, under a rule restricting the resulting allocations. The core of this economy is the set of all allocations where no coalition can improve through the tax system and the restriction.

The nucleolus allocation of this economy is one that can be obtained by minimizing the coalitional excess lexicographically, which is an analogy of the nucleolus of TU-coalitional games. The coalitional excess is a degree of the deficiency of the current allocation for the coalition relative to what the coalition can achieve for itself under the tax system and the restriction, measured in terms of money. Thus, the nucleolus allocation is an allocation where the deficiency is distributed as equal as possible among the coalitions.

The purpose of this paper is to show that the nonempty core coincides with the set of nucleolus allocations in the public goods economy with taxation. We also show a sufficient condition for the core to be nonempty.