Natural Implementation in Public Goods Economies

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報告要旨

In this paper, we examine what kinds of social choice correspondences (SCCs) are implementable in Nash equilibria by "natural" mechanisms in divisible pure public goods economies. We consider four types of "natural" mechanisms. In these mechanisms, each agent announces (i) his own consumption bundle of privete goods, an input vector for public goods, a price vector of private goods and all agents' personalized price vectors of public goods (P^nQ mechanisms), (ii) his own consumption bundle of private goods, an input vector for public goods, a price vector of private goods, his own personalized price vector of public goods and his neighbor's personalized price vector of public goods, (P^2Q mechanisms), (iii) his own consumption bundle of private goods, an input vector for public goods, a price vector of private goods and his own personalized price vector of public goods (IPQ mechanisms), and (iv) his own consumption bundle of private goods and an input vector for public goods (Q mechanisms).

Then, we found conditions for social choice correspondences to be Nash implementable by each of these four natural mechanisms. These characterizations of social choice correspondences depend on the number of goods. First, regardless of the number of goods, the class of Pareto efficient SCCs implemented by P^nQ mechanisms is equivalent to that of Pareto efficient SCCs implemented by P^2Q mechanisms. Second, in the case where there exists only one public good, P^nQ, P^2Q, IPQ and Q mechanisms implement the Lindahl correspondence for any number of private goods. In the case where there exist more than one public goods, P^nQ and P^2Q mechanisms implement the Lindahl correspondence but neither IPQ mechanism nor Q mechanism implements the Lindahl correspondence.

But, the Pareto correspondence is not implemented by P^nQ, P^2Q, IPQ or Q mechanisms, regardless of the number of goods. *Journal of Economic Literature* Classification Numbers: C72, D78, H41.

References

Dutta, B., A. Sen, and R. Vohra (1995). "Nash Implementation through Elementary Mechanisms in Economic Environments," *Economic Design* 1, 173–204.

Saijo, T., Y. Tatamitani, and T. Yamato (1996). "Toward Natural Implementation," *International Economic Review* 37, 949–980.

Yoshihara, N. (2000). "A Characterization of Natural and Double Implementation in Production Economies," *Social Choice and Welfare* 17, 571–599.

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