

A Characterization of Simultaneous Ascending Rule: Strategy-proofness and Efficiency with Nonquasi-linear Preferences

Shuhei Morimoto

Institute of Social and Economic Research, Osaka University
6-1, Mihogaoka, Ibaraki, 567-0047, Japan
E-mail: morimoto@iser.osaka-u.ac.jp

and

Shigehiro Serizawa

Institute of Social and Economic Research, Osaka University
6-1, Mihogaoka, Ibaraki, 567-0047, Japan
E-mail: serizawa@iser.osaka-u.ac.jp

April 21, 2012

Abstract

We consider the problem of allocating several heterogeneous objects among a group of agents and how much they should pay. Each agent receives at most one object and has nonquasi-linear preferences. Nonquasi-linear preferences describe the environments where the large scale of auction payments changes agents' abilities to utilize objects or benefits from them. The purpose of this article is to identify the class of allocation rules that yield a desirable outcome in such environments. The "simultaneous ascending rule" is the rule which assigns the outcome of the simultaneous ascending auction introduced by Demange, Gale, and Sotomayor (1986, *Journal of Political Economy* 94: 863–872) to each preference profile. In this article, we establish that the simultaneous ascending rule is a unique rule that satisfies *strategy-proofness*, *Pareto-efficiency*, *individual rationality*, and *nonnegative payment* on the domain including nonquasi-linear preferences.

Keywords: minimum price Walrasian equilibrium, simultaneous ascending auction, strategy-proofness, efficiency, heterogeneous objects, nonquasi-linear preferences

JEL Classification Numbers: D44, D71, D61, D82