Notions of anonymity for object assignment: impossibility theorems

Hikaru Kondo
Graduate School of Economics, Osaka University
1-7, Machikane-yama, Toyonaka, Osaka, 560-0043, Japan
E-mail: nge009kh@student.econ.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

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Abstract

We search for impartiality in the allocation of objects when monetary transfers are not possible. Our main focus is *anonymity*. The standard definition requires that if agents' names are permuted, their assignments should be permuted in the same way. Since no rule satisfies this definition in this model, we introduce weaker variants, "anonymity for distinct preferences," "pairwise anonymity for distinct preferences," "weak pairwise anonymity for distinct preferences," and "independence of others' permutations." We show that for more than two agents and two objects, no rule is *pairwise anonymous for distinct preferences* and *Pareto-efficient* (Theorem 1), no rule is *pairwise anonymous for distinct preferences* and *independent of others' permutations* (Theorem 2), and no rule is *weakly pairwise anonymous for distinct preferences* and *strategy-proof* (Theorem 3). These results reveal the profound difficulty of obtaining impartiality in object allocation problems.

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