Strategy-Proof Probabilistic Mechanisms for Public Decision with Money

Kazuhiko Hashimoto[*]   Kohei Shiozawa[†]

Abstract

We study strategy-proof probabilistic mechanisms in a binary public decision model when monetary transfers are allowed. We consider not only the pivotal mechanism, the majority voting mechanism, the random serial dictatorship mechanism, and the unanimity mechanism, but also the random chair pivotal mechanism (Faltings 2005), which is a probabilistic variant of the pivotal mechanism.

We first show that the random chair pivotal mechanism, the majority voting mechanism, the random serial dictatorship mechanism, and the unanimity mechanism are second-best efficient.

Next, we calculate the expected welfare of the mechanisms by the Monte Carlo method, where each agent's valuation is independently, identically, and uniformly (or normally) distributed. These calculations exhibit that the random chair pivotal mechanism is more efficient than the other mechanisms. We also show that in large economies, the random chair pivotal mechanism is efficient, while the other mechanisms might be highly inefficient.

Finally, we characterize the random chair pivotal mechanism with strategy-proofness, budget-balance, equal treatment of equals, and decision-robustness.

This paper is available at:
http://www.iser.osaka-u.ac.jp/library/dp/2016/DP0964.pdf

[*]Faculty of Economics, Osaka University of Economics, 2-2-8 Osumi, Higashiyodogawa-ku, Osaka 533-8533, JAPAN; Email: `kazuhiko@osaka-ue.ac.jp`

[†]Graduate School of Economics, Osaka University, 1-7 Machikaneyama, Toyonaka, Osaka 560-0043, JAPAN; Email: `nge013sk@student.econ.osaka-u.ac.jp`