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A Maximal Domain for the Existence of Bribe-proof Rules

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Abstract: We consider the problem of allocating an amount of a perfectly divisible good among a group of agents. When the amount is fixed, an economy is described by a preference profile alone. A class of preference profiles is called a preference domain. A rule is a mapping defined on some preference domain, which assigns a feasible allocation to each economy. We first characterize the uniform rule (Benassy, 1982) as the unique *bribe-proof* (Schummer, 2000) and *symmetric* rule on the single-peaked domain. *Bribe-proofness* requires each agent to have no incentive to bribe another single agent to misrepresent in order to jointly benefit, irrespective of what the other agents represent.

Next, we ask how much the single-peaked domain can be enlarged to still allow for the existence of *bribe-proof* and *symmetric* rules. Ching and Serizawa (1998) study a similar question and consider the situation in which each economy is represented by a pair of one preference profile and the amount of the good. We adapt the same setting as Ching and Serizawa (1998) in studying the second question. Ching and Serizawa (1998) show that the single-plateaued domain is the unique maximal preference domain that includes the single-peaked domain and allows for the existence of *Pareto efficient*, *strategy-proof*, and *symmetric* rules. On the single-peaked domain, *bribe-proofness* implies *Pareto efficiency* and *strategy-proofness*. So, one may conjecture that the single-plateaued domain is the unique maximal preference domain that includes the single-peaked domain and allows for the existence of *bribe-proof* and *symmetric* rules. However, the conjecture turns out to be wrong. We show that the convex domain is the unique maximal preference domain that includes the single-peaked domain and allows for the existence of *bribe-proof* and *symmetric* rules. Note that the convex domain is strictly larger than the single-plateaued domain.