

Complete Exchange Mechanisms

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This paper studies one-sided matching under a complete exchange (CE) requirement, where each agent must be assigned an object different from its initial endowment. We introduce assignment partition -- a partition of agents and choice sets that builds CE into feasibility -- and, within this structure, propose two new mechanisms.

Chain Serial Dictatorship (C-SD) operates within the partition as a binding-choice chain: the highest-priority agent picks from its allowed set and the right to pick passes to the owner of the chosen object; if that owner has already picked, the right reverts to the highest-priority remaining agent. Two-Stage Serial Dictatorship (T-SD) operates within the partition as a nominate-then-assign procedure: in Stage 1, agents tentatively nominate objects in exogenous priority, and the owners of nominated objects determine an endogenous final priority; in Stage 2, serial dictatorship runs within the partition using that final priority. For any given assignment partition, C-SD and T-SD simultaneously satisfy strategy-proofness, respecting improvement, and efficiency relative to the partition.

We then examine the limits of pursuing market-wide efficiency under the CE constraint. As a benchmark, we study a modified TTC, CE-TTC, which first enforces a CE-compliant reassignment and then runs a self-avoiding top-trading-cycles phase; CE-TTC achieves efficiency within the CE constraint and strategy-proofness but fails respecting improvement. Moreover, for three and four agents, no mechanism can simultaneously achieve efficiency within the CE constraint, respecting improvement, and strategy-proofness. These findings underscore the value of partition-based design for truthful implementation with investment incentives under a hard CE mandate.