

Object Allocation via Deferred-Acceptance: Strategy-Proofness and Comparative Statics

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Abstract

We study the problem of assigning indivisible and heterogeneous objects (e.g., houses, jobs, offices, school or university admissions etc.) to agents. Each agent receives at most one object and monetary compensations are not possible. We consider mechanisms satisfying a set of basic properties (unavailable-type-invariance, individual-rationality, weak non-wastefulness, or truncation-invariance). In the house allocation problem, where at most one copy of each object is available, deferred acceptance (DA)-mechanisms allocate objects based on exogenously fixed objects' priorities over agents and the agent-proposing deferred-acceptance-algorithm. For house allocation we show that DA-mechanisms are characterized by our basic properties and (i) strategy-proofness and population-monotonicity or (ii) strategy-proofness and resource-monotonicity. Once we allow for multiple identical copies of objects, on the one hand the first characterization breaks down and there are unstable mechanisms satisfying our basic properties and (i) strategy-proofness and population-monotonicity. On the other hand, our basic properties and (ii) strategy-proofness and resource-monotonicity characterize (the most general) class of DA-mechanisms based on objects' fixed choice functions that are acceptant, monotonic, substitutable, and consistent. These choice functions are used by objects to reject agents in the agent-proposing deferred-acceptance-algorithm. Therefore, in the general model resource-monotonicity is the "stronger" comparative statics requirement because it characterizes (together with our basic requirements and strategy-proofness) choice-based DA-mechanisms whereas population-monotonicity (together with our basic properties and strategy-proofness) does not.