Singles monotonicity and stability in one-to-one matching problems*

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Abstract

We consider two-sided one-to-one matching problems and study a new requirement called “own-side singles monotonicity.” Suppose that there is an agent who is not matched with any agent in a problem. Let us call her a “single-agent.” Now in a new problem (with the same set of agents), we improve (or unchange) the single-agent’s ranking of each agent on the opposite side of her. Own-side singles monotonicity requires that each agent on the same side of the single-agent should not be made better off (except for the single-agent). Unfortunately, there is no single-valued solution that satisfies own-side singles monotonicity and stability. However, there is a (multi-valued) solution, the stable solution, that satisfies it. We provide two characterizations of the stable solution based on own-side singles monotonicity. It is the unique solution satisfying weak unanimity, null player invariance, own-side singles monotonicity and consistency. The uniqueness also holds by replacing consistency with Maskin invariance. In addition, we study an impact of improving a single-agent to agents on the opposite side of her.

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Key-words: one-to-one matching; own-side singles monotonicity; other-side singles monotonicity; stability; consistency; Maskin invariance.

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