

Nash Implementation in Production Economies with Unequal Skills: A Complete Characterization

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Abstract

In production economies with unequal labor skills, one of the intrinsic features for Nash implementation problems is the lack of information about individual skills, which makes the planner ignorant to the set of feasible allocations in advance of production. Given this intrinsic feature, the paper firstly introduces a new axiom, *Non-manipulability of Irrelevant Skills (NIS)*, which together with *Maskin Monotonicity* constitute the necessary and sufficient conditions for Nash implementation. Secondly, the paper defines four conditions of natural mechanisms which seem relevant, and then shows that any efficient allocation rule is Nash-implementable by the natural mechanisms if and only if it satisfies a slightly stronger variation of **NIS** and *Supporting Price Independence*. Following these characterizations, it is shown that there is a Maskin monotonic allocation rule which is not implementable when information about individual skills is absent. In contrast, there are many fair allocation rules which are known to be non-implementable in the present literature, but are implementable by the natural mechanisms given in this paper.

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