Dynamic Mechanism Design without Transfers

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Abstract

This thesis consists of three chapters.

In chapter 1, titled "Design of Committee Search," I apply a mechanism design approach to committee search problems, such as hiring by a department or a couple's search for a house. A special class of simple dynamic decisions rules have agents submit in each period one of three votes: veto, approve, or recommend; the current option is adopted whenever no agent vetoes and at least one agent recommends. I show that every implementable payoff can be attained by randomizing among these simple rules. This result dramatically simplifies the design problem.

In chapter 2, titled "School Choice with Observable Characteristics," I study a school choice problem where students have observable characteristics that are correlated with their preferences. For example, one such characteristic may be the location of a student's home, which is correlated with preferences if students tend to prefer nearby schools. I consider mechanisms that are envy-free, efficient, and treat students with the same observable characteristics equally. I show that the welfare-maximizing mechanism in this class is a modified probabilistic serial mechanism with capacities. These capacities specify the maximum number of students with given characteristics that can be admitted into each school.

In chapter 3, titled "Mechanism Design for Stopping Problems with Two Actions," I analyse a class of dynamic mechanism design problems in which a single agent privately observes a time-varying state, chooses a stopping time, and upon stopping, chooses between two actions. The principal designs transfers that depend only on the time the agent stops and on the alternative the agent chooses. The analysis provides necessary and sufficient conditions for implementability in this environment. In particular, I show that any stopping rule in which the agent stops the first time the state falls outside of an interval in the state space can be implemented if and only if a pair of monotonicity conditions is satisfied.