

A Dynamic Mechanism Design for Scheduling with Different Lengths of Use*

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Abstract

A dynamic allocation problem is considered. A number of identical perishable goods, such as time slots of a central facility or hotel rooms, are allocated at each period. A number of agents randomly come to a mechanism, and each agent wants to keep winning a good for more than one period to make profits. The seller offers simple long-term contracts that guarantee future allocations to agents. We characterize incentive compatible mechanisms in our domain of mechanisms, and provide a dynamic VCG mechanism that achieves efficient allocations. The seller's revenue is maximized by virtual valuation maximization under a monotone hazard rate condition. In the revenue-maximizing mechanism, long-stay agents tend to pay some premium per period compared to short-stay agents.

Keywords: dynamic mechanism, online mechanism, dynamic population, dynamic VCG mechanism, optimal auction

JEL classification: C73, D44, D82

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