Dynamic Matching Market Design

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We introduce a simple benchmark model of dynamic matching in networked markets, where agents arrive and depart stochastically and the network of acceptable transactions between agents forms a random graph. We analyze our model from three perspectives: waiting time, optimization, and information. The main insight of our analysis is that waiting to thicken the market can be substantially more important than increasing the speed of transactions, and this is quite robust to the presence of waiting costs. From an optimization perspective, naïve local algorithms, that choose the right time to match agents but do not exploit global network structure, can perform very close to optimal algorithms. From an information perspective, algorithms that employ even partial information on agents' departure times perform substantially better than those that lack such information. Information and waiting are complements; information about departure times is necessary for waiting to yield large gains. To elicit agents' departure times, we design an incentive-compatible continuous-time dynamic mechanism without transfers. LINK: www.ssrn.com/abstract=2394319

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