Dynamic Revenue Maximization:
A Continuous Time Approach

Dirk Bergemann*    Philipp Strack †

April 30, 2014

Abstract

We characterize the profit-maximizing mechanism for repeatedly selling a non-durable good in continuous time. The valuation of each agent is private information and changes over time. At the time of contracting every agent privately observes his initial type which influences the evolution of his valuation process. In the profit-maximizing mechanism the allocation is distorted in favor of agents with high initial types.

We derive the optimal mechanism in closed form, which enables us to compare the distortion in various examples. The case where the valuation of the agents follows an arithmetic/geometric Brownian motion, Ornstein-Uhlenbeck process, or is derived from a Bayesian learning model are discussed. We show that depending on the nature of the private information and the valuation process the distortion might increases or decreases over time.

JEL Classification: D44, D82, D83.

*Department of Economics, Yale University, New Haven, CT 06511, dirk.bergemann@yale.edu
†Microsoft Research and University of California, Berkeley, One Memorial Drive Cambridge, MA 02142, pstrack@microsoft.com