SEMINAR

"Illiquid financial markets and nonlinear stochastic integrals"

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Abstract:

In the standard models in mathematical finance markets are assumed to be totally liquid. This means that the securities can be traded at any time and transactions of an individual investor have no impact on the market price. This idealization is significantly violated if investors become large or asset positions have to be liquidated quickly -- espectially during some financial crisis. Then, large sales let the market price fall significantly. Whereas in the standard liquid market model trading gains are modelled by linear stochastic integrals, in the more general illiquid case nonlinear stochastic integrals are required. We discuss the construction of nonlinear stochastic Itô-integrals w.r.t. a family of semimartingales which depend on a /spatial/ parameter. In particularly, we are interested in the case that the dependency on the spatial parameter may be discontinuous. We investigate under which conditions a nonlinear integral can be approximated by nonlinear integrals with piecewise constant integrands. Furthermore, we discuss the utility maximization problem in illiquid market models and compare its solution with the optimal strategy in the liquid model.