Gordan Žitković: *Utility Maximization with a Stochastic Clock*

Abstract: We use the notion of a utility functional with a stochastic clock to model the discrepancy between the speed of the physical (stock-market) time and the time at which an agent accrues utility. The problems of maximization of utility of terminal wealth, the utility of consumption over deterministic or random time horizons, as well as the problems with random prohibition of consumption all fall within our framework. In order to deal successfully with the stochastic clock problems, we introduce a new functional-analytic setup and show that it is general enough to deal with non-bounded random endowments. Finally, we give explicit solution of a stochastic-clock problem in an Itô process financial market.