FAKULTÄT FÜR MATHEMATIK
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Einladung zur öffentlichen Defensio von

Dipl.-Math.Oec. Lingqi GU

Thema der Dissertation:

Portfolio Optimization: the Dual Optimizer and Stability

Abstract:

We consider the dual problem of portfolio optimization problems in markets with/without transaction costs, especially the property of optimal dual processes which produce the unique dual optimizer (solution) to the dual problem.

Even in an incomplete semimartingale market, in general, the unique optimal dual process is not a local martingale but a supermartingale. However, if the stock price is a continuous semimartingale, then the optimal dual process is a local martingale. This result can be extended to the case with bounded random endowment. Precisely, the countable additive part of the dual optimizer obtained by Cvitanić, Schachermayer, Wang in 2001 can be attained by a local martingale $\widehat{Y}$, which is a supermartingale deflator, defined by Kramkov and Schachermayer in 1999, when the underlying filtration is generated by Brownian motion.

Then we discuss such problem in markets with transaction costs, where the stock price process is continuous. Under sufficient conditions, all optimal dual processes (may not be unique) are local martingales. Then, we consider the convergence of optimal dual processes and shadow price processes, after having acquired static stability of the utility maximization problem.

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Zeit: Montag, 24. April 2017, 11:30 Uhr

Ort: Fakultät für Mathematik, Besprechungszimmer 03.Stock, Oskar-Morgenstern-Platz 1