

Monday March 31, 2008
Stochastic Analysis Seminar

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Title:

In which Financial Markets do Mutual Fund Theorems hold true?
(joint work with Walter Schachermayer and Erik Taflin)

Abstract:

The Mutual Fund Theorem (MFT) is considered in a general semimartingale financial market \mathbb{S} with a finite time horizon T , where agents maximize expected utility of terminal wealth. The main results are:

1: Let N be the wealth process of the numeraire portfolio (i.e. the optimal portfolio for the log utility). If any path-independent option with maturity T written on the numeraire portfolio can be replicated by trading only in N , then the (MFT) holds true for general utility functions, and the numeraire portfolio may serve as mutual fund. This generalizes Merton's classical result on Black-Merton-Scholes markets.

Conversely, under a supplementary weak completeness assumption, we show that the validity of the (MFT) for general utility functions implies the replicability property for options on the numeraire portfolio described above.

2: If for a given class of utility functions (i.e. investors) the (MFT) holds true in all complete Brownian financial markets \mathbb{S} , then all investors use the same utility function U , which must be of HARA type. This is a result in the spirit of the classical work by Cass and Stiglitz.