



16 March - Sergio Pulido (ENSIIE)

Density of probability measures with the martingale representation property

Using the theory of analytic maps, we prove density results for measures satisfying

a backward formulation of the martingale representation property. These results are useful to study

24 February - Agostino Capponi (Columbia)

Bail-ins

For high order approximation schemes (where "high" stands for greater than one), the inevitable loss of monotonicity prevents the use of the classical theoretical results for convergence to viscosity solutions.

The work introduces a suitable local modification of these schemes by "filtering" them with a monotone scheme, such that they can be proven convergent and still show an overall high order behaviour for smooth enough solutions.

We give theoretical proofs of these claims and illustrate the behavior with numerical tests from mathematical finance, focusing also on the use of backward differencing formulae for constructing the high order schemes.

24 November - Aditi Dandapani (ETH Zurich)

Strict Local Martingales and Initial Expansions of Filtrations

Beginning with a non negative model following a stochastic differential equation with stochastic volatility, we show how a strict local martingale might arise from a true martingale as a result of an enlargement of the underlying filtration. More precisely, we implement a particular type of enlargement, an "initial expansion" of the filtration, for various kinds of stochastic differential equation models, and we provide sufficient conditions such that this expansion can turn a martingale into a strict local martingale. Applications of our work include the modeling and detection of financial bubbles. For example, one might postulate that a bubble arises as a result of the arrival of new information, which we can model via an enlargement of the filtration.

17 November - Martin Larsson (ETH Zurich)

Conditional infimum and recovery of monotone processes

Monotone processes, just like martingales, can often be reconstructed from their final values. Examples include the running maximum of supermartingales, of fractional Brownian motion, and more generally, running maxima and local times of sticky processes. An interesting corollary is that any positive local martingale can be reconstructed from its final value and its global maximum. These results are derived from a simple no-arbitrage principle for monotone processes on certain complete lattices, analogous to the fundamental theorem of asset pricing in mathematical finance. The framework of comp 0 Td 76 on

and the process of sites visited by a random walk. The notion of conditional infimum is at the center of all of these results.

10 November -

13 October - Frank Seifried (Trier)

Epstein-Zin Stochastic Differential Utility: Foundations, Properties, and Portfolio Optimization

This talk presents some recent contributions to the theory and applications of Epstein-Zin (EZ) stochastic differential utility.

First, we provide novel results on existence, uniqueness and concavity as well as a utility gradient inequality for EZ utility in a general semimartingale setting. In the second part, I would like to address consumption-portfolio choice with EZ utility.

We develop a new approach to solve such problems in a large class of incomplete market models, based on fixed point arguments and the associated FBSDE system. Finally, using an asymptotic analysis we show how small proportional transaction costs influence optimal consumption and investment decisions of an agent with EZ utility.