

Kolloquium  
**Finanz- und Versicherungsmathematik**

08.05.2015

**Thorsten Rheinländer** (TU Wien)

**Financial markets with a large trader**

Abstract:

We consider a financial agent whose trading strategies might influence the price processes of financial assets. This puts some constraints on the set of admissible strategies the agent has at her disposal, typically they will have to be continuous and of finite variation. On the other hand, the large trader often has an information advantage, and can at least anticipate her own strategies which will have a price impact; this information will not be available to small traders. In this context we study absence of arbitrage as well as exponential utility maximization. Depending on the strength of the price impact, some new phenomena may show up.

**Gunther Leobacher** (JKU Linz)

**A numerical method for SDEs with discontinuous drift**

Abstract:

Many stochastic control problems from mathematical finance or insurance lead to stochastic differential equations (SDEs) with discontinuous drift coefficient. For this kind of SDE the classical existence and uniqueness result by K. Itô as well as G. Maruyamas proof of convergence of the Euler method breaks down. We introduce a transformation technique, which can on the one hand be used to prove existence and uniqueness for a class of SDEs with discontinuous drift coefficient. On the other hand we present a numerical method based on transforming the Euler-Maruyama scheme for such a class of SDEs. We prove convergence of order  $1/2$  for 1-dimensional autonomous SDEs with piece-wise Lipschitz drift coefficient and non-degenerate diffusion coefficient. We present numerical examples with applications to a problem from insurance and we discuss the computational cost of the algorithm. Next we sketch the idea of how to generalize the method to  $d$  dimensions. One problem here is to find a suitable  $d$ -dimensional notion of "piece-wise Lipschitz".

**Arian Cani** (Université de Lausanne)

**Maximizing the expected discounted surplus**

Abstract:

In this talk, we consider the surplus process of an insurance company within the Cramér-Lundberg framework with the intention of controlling its performance by means of dynamic reinsurance. Our aim is to find a general dynamic reinsurance strategy that maximizes the expected discounted surplus level integrated over time. Using analytical methods we identify the value function as a particular solution to the associated Hamilton-Jacobi-Bellman equation. This approach leads to an implementable numerical method for approximating the value function and optimal reinsurance strategy. Furthermore we give some examples illustrating the applicability of this method for proportional and XL-reinsurance treaties.

**Markus Hofer** (ING Amsterdam)

**Wrong way risk in credit valuation adjustments**

Abstract:

Seit der letzten großen Finanzkrise ist es Industriestandard den Wert von Finanzgeschäften mit dem Ausfallsrisiko einer der Vertragsparteien zu bereinigen (credit valuation adjustments oder CVA). Dies führt zu extrem aufwändigen Berechnungen, so wohl in Bezug auf Berechnungszeit als auch bezüglich der Komplexität der mathematischen Modelle. Insbesondere wenn eine starke Abhängigkeit zwischen dem Wert des zugrundeliegenden Vertrages und der Ausfallswahrscheinlichkeit einer Vertragspartei herrscht (Wrong/Right way risk), ist Modellierung und Kalibrierung äußerst kompliziert.