

Friday **2.1.2009**

Chairman

9:30 - 10:00 registration

J. Hannig↓

10:00 - 10:50 Jan Večeř · Columbia University, New York, USA

Exploring Symmetry in Contingent Pricing

In this talk I will show how to use symmetry arguments in order to derive simple and often model independent formulas for prices and hedges of typical contingent claims. The methods used here are extensions of numeraire techniques used in option pricing. We will show that this approach leads to model independent formulas for European Options; and simple methods for pricing Barrier, Lookback and Asian Options when some dynamics of the underlying asset price is specified.

11:00 - 11:50 Bohdan Maslowski · Math. Institute, AS CR (AV ČR), Prague, CZ

Stochastic Ergodic Control in Infinite Dimensions

12:00 - 14:00 lunch time

J. Večeř↓

14:00 - 14:50 Karel Janeček · RSJ Invest, a.s., Prague, CZ

High-frequency black-box trading of short-term interest rate futures contracts

We will provide an introduction to short-term trading strategies on liquid financial markets. Various trading strategies evaluate the incoming information and use analytical results for active trading. The trading algorithms need to work with as low latency as possible, often within milliseconds. We will provide more details for interest rate futures contracts trading with several different expirations.

15:00 - 15:50 Jan Swart · ÚTIA AS CR (AV ČR), Prague, CZ

Tightness of voter model interfaces

In this talk we consider long-range, one-dimensional voter models started with all zeros on the negative integers and all ones on the positive integers. Assuming that the infection rates have a finite second moment, it can be shown that the area where the two types meet does not grow unboundedly, but reaches a finite equilibrium size. I will discuss a new, short proof of this fact. This is joint work with Anja Sturm (Delaware).

16:00 - 16:30 coffee break

K. Janeček↓

16:30 - 17:20 Jan Hannig · The University of North Carolina at Chapel Hill, USA

Detecting Jumps from Lévy Jump Diffusion Processes

Recent asset pricing models incorporate jump risk through Lévy processes in addition to diffusive risk. This paper studies how to detect stochastic arrivals of small and big Lévy jumps with new nonparametric tests. They allow for robust analysis on their separate characteristics and facilitate better estimation of return dynamics. Empirical evidence based on our tests suggests that models for both individual equities and overall market indices require Lévy-type jumps due to our finding of many small jumps as well as big jumps. This evidence of small jumps also offers a resolution for the puzzle: why jumps in the index are uncorrelated with jumps in its component equities. Joined work with Suzanne S Lee

17:30 - 18:20 Tomáš Tichý · Technical University of Ostrava, CZ

The risk of FX sensitive portfolio - the choice of copula function

For financial institutions, foreign exchange (FX rates commonly constitute the most important part of the market risk. In order to assess the risk of opened position various models can be used. However, since real FX returns exhibit higher than normal kurtosis and since the very far tails of the distribution should be measured too, the Monte Carlo simulation of multidimensional Lévy processes seems to be the most efficient approach. In this paper we focus on two approaches to modeling of multidimensional Lévy processes. First, we show how a simplifying multidimensional Lévy model of a unique subordinator can be used to obtain the risk measures of portfolio. Second, we study the more complex models of joining the independent processes by means of copula functions. Special attention is paid to the choice of proper copula function.

19:00 - 22:00 dinner

9:00 - 9:30 tea

T. Tichý↓

9:30 - 10:20 Jan Pospíšil · University of West Bohemia, Plzeň, CZ

Random graininess in stochastic difference equations

We study a simple extension of the linear first-order difference equations. Our generalization is based on variable, and random lengths of time steps. Our interest is devoted to magnitudes of solutions of these equations. We illustrate our approach and results by couple of economic models. In economics, both discrete time and infrequent decisions are widely accepted. We study the dependence of micro- or macroeconomic outcomes on different lengths of tenures and institutional algorithms that determines them. We focus on situations when the goal is the stabilization of a certain variable (inflation, price of a certain goods, etc.) Interestingly, our analysis reveals one unexpected trade-off. The more free rules are (i) the higher is the probability of stabilization, but also (ii) the higher is the probability of extreme outcomes in the short-term prospect.

10:30 - 11:00 Petr Dostál · KPMS MFF UK, Prague, CZ

Futures trading with proportional transaction costs

We consider an investor, who takes positions in the futures contracts, pays proportional transaction costs, do not consume and is interested in his/her wealth far in the future. We assume that the futures price is an arithmetic Brownian motion and this assumption together with the restriction to utility function with hyperbolic absolute risk aversion (HARA) enable us to evaluate interval investment strategies. It is shown that the optimal interval strategy is also optimal among a wide class of admissible strategies.

11:00 - 11:15 tea

J. Pospíšil↓

11:15 - 11:45 Jakub Staněk · KPMS MFF UK, Prague, CZ

Stochastic epidemic model with multiple pathogen

Multiple pathogens are involved in the spread of many human diseases including influenza, malaria, etc. Very general model, which is described by SDE, will be presented. We investigated properties of solutions to the SDE and its existence and uniqueness. Finally, some less general models will be shown.

11:50 - 12:20 Jana Šnupárková · KPMS MFF UK + MI AS CR (AV ČR), Prague, CZ

Existence slabého řešení stochastické diferenciální rovnice řízené frakcionálním Brownovým pohybem

Ukážeme existenci slabého řešení n -rozměrné stochastické diferenciální rovnice řízené frakcionálním Brownovým pohybem s Hurstovým parametrem $H \in (0, 1) \setminus \{\frac{1}{2}\}$, kde difuze je závislá na čase, avšak nikoli na řešení, a drift může být rozdělen na regulární a singulární část. Musí ovšem splňovat předpoklady Girsanovovy věty. Na závěr uvedeme rovnici stochastického oscilátoru řízenou frakcionálním Brownovým pohybem.

12:25 - 12:55 Andrea Karlová · KPMS MFF UK + ÚTIA AS CR (AV ČR), Prague, CZ

Kalibrace úrokových derivátů