
Friday**3.1.2014****Chairman**

9:40 - 10:10 registration

J. Pospíšil↓

10:10 - 11:00 Jan Večeř · Frankfurt School of Fin. & Manag., Frankfurt, Germany

*Crossing in soccer has a strong negative impact on scoring:**Evidence from the English Premier League and the German Bundesliga*

Crossing in soccer plays a significant role in scoring, about 15% of all goals scored in the recent seasons of the English Premier League are the result of open play crosses. However, crossing from an open play is hugely inefficient, only 1 open cross out of 91.92 leads to a goal on average. When we estimate the impact of open crossing on scoring of the individual teams using multilevel Poisson regression, we conclude that the net effect of crossing is typically negative or neutral at best. An average team can score up to additional 0.656 goals per game if it reduced open crossing. The quality of the team is the major explanatory factor on the number of such missed scoring opportunities, stronger teams miss more goal opportunities in general when crossing than weaker teams. Stronger teams have more options how to score and open play crossing seems as one of the suboptimal ways of a goal creation. Teams such as Arsenal, Chelsea, Liverpool, Manchester City or Tottenham have a potential of scoring an extra goal per match if they reduced open crossing. A reversed picture is seen in the defense analysis, more goal opportunities are missed in general when crossing against weak teams than crossing against strong teams. Interestingly, the actual conversion of open crosses to goals plays only a minor role for explaining the impact of open crossing on goals.

11:10 - 12:00 Tomáš Tichý · Technical University of Ostrava, CZ

Law of Large Numbers for Random LU-Fuzzy Numbers: Theoretical and Empirical Proves

Financial problems can be analyzed by several ways. In the standard case, we assume that a given financial quantity in question is a stochastic (or random) variable, ie. it follows some probability distribution and its possible states can get prescribed particular probabilities. However, in financial modeling it can appear that the estimation of parameters of such models (e.g. volatility) does not lead to reliable results, so that it can be fruitful to incorporate some kind of impreciseness. One can recognize an unnatural simplification of parameters that can lead to a loss of important information hidden in data. If one wants to apply Monte Carlo simulation to analyze a financial problem with values expressed by imprecisely defined numbers, it is important to show that random variables with imprecisely defined numbers satisfy the (strong) law of large numbers, as well. Otherwise such approach would have no sense. The aim of the paper is to provide a justification to this novel approach. Besides theoretical proves we show also via empirical example that the law holds for a given type of imprecise number.

12:00 - 14:00 lunch time

T. Tichý↓

14:00 - 14:50 Jan Pospíšil · University of West Bohemia, Plzeň, CZ

A comparison of three different stochastic population models with regard to persistence time

In this talk, we introduce and compare three different stochastic population models with regard to persistence time, or time to extinction. We study the discrete and continuous-time Markov chain models (DTMC and CTMC) as well as the model described by the stochastic differential equation (SDE). In particular, the SIS epidemic model in all three variants will be studied and compared to the deterministic model.

Friday **3.1.2014**

Chairman

14:50-15:00 *break*

T. Tichý↓

15:00 - 15:50 Tomáš Sobotka · University of West Bohemia, Plzeň, CZ

On Fractional Stochastic Volatility Model

We study a new option pricing model with a jump-diffusion process for stock price evolution and with stochastic volatility that follows a fractional CIR stochastic differential equation (SDE). As a driving process in the SDE we consider a fractional Gaussian noise with Hurst parameter $H \in (1/2, 1)$. In this case the volatility process exhibits a long-memory property which has been observed on several financial markets.

16:00 - 16:50 Milan Mrázek · University of West Bohemia, Plzeň, CZ

Calibration and Simulation of Heston Model

We show how to calibrate Heston stochastic volatility model to real market data using several optimization techniques. We compare both global (GA, ASA) and local (MATLAB lsqnonlin - trust region reflective, Excel - generalized reduced gradient) optimizers for different weights showing remarkable differences even for data (DAX options) from two consecutive days. Further we present several simulation schemes that are tested using the parameters obtained by calibration to real market data. Next to the known schemes (log-Euler, Milstein, QE, Exact scheme, IJK) we introduce also a new method combining the Exact approach and Milstein (E+M) scheme. Test is carried out by pricing European call options by Monte Carlo method.

16:50 - 17:20 *coffee break*

J. Večeř↓

17:20 - 18:10 František Žák · Imperial College London, UK

Diffusion processes on Heisenberg group

We introduce the concept of Heisenberg group and then investigate the diffusion naturally associated with Lie Algebra of Heisenberg group. Using the theory of Meyn - Tweedie we show that exponential ergodicity holds for our diffusion. Furthermore, we notice that the result is easily extended to any finite dimension. Finally, we give a few remarks about the infinite dimensional case.

18:20 - 19:10 Karel Janeček · RSJ a.s., Prague, CZ

The effect of multiple votes: revolution in democracy ?

19:15 - 22:00 *dinner*

Saturday **4.1.2014**

Chairman

9:20 - 9:50 *tea*

P. Dostál↓

9:50 - 10:40 Lenka Slámová · KPMS MFF UK, Prague, CZ

Discrete stable GARCH models and option pricing

10:50 - 11:20 Petr Čoupek · KPMS MFF UK, Prague, CZ

Law of Large Numbers for Random LU-Fuzzy Numbers: Theoretical and Empirical Proves

11:30 - 12:20 Petr Dostál · KPMS MFF UK, Prague, CZ

From optimal investment to reality

12:20 - 14:00 *lunch time*