**2018 Financial Risk Analytics Day**

**Invited Talks**

**Speaker**: Chen Zhou, Erasmus University and de Nederlandsche Bank

**Talk title**: Why risk is so hard to measure

**Abstract**: This paper analyzes the reliability of standard approaches for financial risk analysis. We focus on the difference between Value-at-Risk and expected shortfall, their small sample properties, the scope for

underreporting risk and how estimation can be improved. Overall, we find that risk forecasts are extremely uncertain at low sample sizes, with Value-at-Risk more accurate than expected shortfall. Value-at-Risk is easily deliberately underreported without violating regulations and control mechanisms. Finally, we discuss the implications for academic research, practitioners and regulators, along with best practice suggestions.

**Speaker**: Johanna Neslehova, McGill University

**Talk title:** Modeling dependence between extreme risks

**Abstract:**Rare events such as large financial losses, insurance claims, and environmental catastrophes are of prime concern in risk management. In this talk, I will discuss how the dependence between extreme risks can be assessed and modelled using copula-based techniques. To guard against the underestimation of dependence at extreme levels, extreme-value copula models are often used. Thanks to much recent progress, this class of models is quite well understood and various techniques for model simulation, fitting and validation are available. However, extreme-value copulas are asymptotic dependence structures and as such not always adequate for observed data.  In such pre-asymptotic settings, the recently proposed Archimax copula class may be a viable alternative. As I will explain, Archimax copulas are not necessarily extreme-value, but designed to be in the domain of attraction of the latter as to avoid risk underestimation. Inference techniques for Archimax copula models are becoming available and I will report on recent progress.

Speaker: Marius Hofert, University of Waterloo

**Talk title**: The Adaptive Rearrangement Algorithm: Numerics and implementation in 'qrmtools'

**Abstract**: Computing worst Value-at-Risk for the sum of homogeneous risks can already be numerically challenging. For sums of not necessarily homogeneous risks, the Rearrangement Algorithm (RA) is a popular algorithm to provide (bounds on) worst Value-at-Risk. The more recently suggested Adaptive Rearrangement Algorithm (ARA) addresses conceptual and computational improvements to the RA for computing worst Value-at-Risk. In this talk, we have a closer look at the ARA and its implementation in the R package 'qrmtools'.

**Speaker**: Matt Davison, Western University

**Talk title**: The Credit Fraud Game

**Abstract**: In this talk I present a stylized model of the credit granting decision, in which it is modelled as a three part "game" between fraudsters, honest borrowers, and financial institutions.   I draw financial and operational insights

from this model. This is a joint work with Dr. Mimi Chong, US Bank, Charlotte NC and Professor Cristian Bravo, University of Southampton, UK.

**Speaker**: Hansheng Sun, Scotiabank

**Talk title**: Challenges and opportunities in data-driven credit risk rating for corporate entities

**Speaker**: Qiming Wang, Scotibank

**Talk title**: Challenges in probability of default (PD) estimation: data analysis and probabilistic programming