

Announcement WiSe 2019/2020

Advanced Seminar

Univariate and multivariate extreme value theory

Prof. Dr. Scherer, PD Dr. Min

Area/ Module ID: Mathematical Finance/ MA6015

Content: We discuss univariate and multivariate extreme-value theory on both a theoretical and applied level. Univariate theory encompasses classical limit results for order statistics, the peaks-over-threshold method and estimation. Multivariate theory focuses on the dependence among extreme events. Applications are considered from the insurance industry, mostly from non-life and operational risk. Each participant presents one of the selected papers and discusses subsequent developments in the respective field. This provides a broad overview to all participants on the different topics, recent aspects, and historical development of the topics.

Continued next Semester: No

Audience: max. 8 master students

Prerequisite: “Stochastic Analysis”, “Continuous Time Finance”

Literature:

1. **Embrechts, P., Klüppelberg, C., Mikosch, T. (1997):** Modelling Extremal Events for Insurance and Finance.
2. **Gumbel, E. (1958):** Statistics of Extremes.
3. **Gudendorf, G. and Segers, J. (2009):** Extreme-Value Copulas. In “Copula Theory and Its Applications”, Chapter 6.
4. **Chavez-Demoulin, V., Embrechts, P., Nešlehova, J. (2005):** Quantitative Models for Operational Risk: Extremes, Dependence and Aggregation. (Link: ftp://ftp.math.ethz.ch/hg/users/embrecht/manuscript_cen.pdf)
5. **Hosking, J.R., Wallis, J.R., Wood, E.F. (1985):** Estimation of the Generalized Extreme-Value Distribution by the Method of Probability-Weighted Moments. *Technometrics*, 27, pp. 251-261.
6. **Weissman, I. (1978):** Estimation of Parameters and Larger Quantiles Based on the k Largest Observations. *Journal of the American Statistical Association*, 73, pp.812-815.
7. **Mielniczuk, J., Wojdylo, P. (2007):** Estimation of Hurst Exponent Revisited. *Computational Statistics and Data Analysis*, 51, pp. 4510-4525.
8. **Heffrenan, J.E., Tawn, J.A. (2004):** A Conditional Approach for Multivariate Extreme Values. *J. R. Statist. Soc. B*, 66, pp. 497-546.

Certificate: 3 CP

Seminar information: Preliminary meeting on July 18th at 14:00 in Seminar Room 2.01.11