

RISK DAY 2005

Mini-Conference on Risk Management in Finance and Insurance

organised by

RiskLab (www.risklab.ch) and Center of Competence Finance in Zurich (www.ccfz.ch)

Location

ETH Zürich, Main Building, Rämistrasse 101, 8092 Zürich Lecture Theatre HG F5.
Refreshments in the «Uhrenhalle» (main hall, F-floor)

Time

Friday, October 21, 2005, full day

Program

8.30–8.45

Prof. Dr. Paul Embrechts (Department of Mathematics, ETH Zürich)

Quantitative Risk Management: Concepts, Techniques and Tools

Abstract: Together with Alexander McNeil and Rüdiger Frey we just finished a book with the same title, Princeton University Press (2005), for details follow this link. In my talk I will present some examples from the book which show how interesting methodological research and relevant practical applications often go hand in hand in the field of QRM.

8.45–9.15

Prof. Dr. Peter Zweifel (Socioeconomic Institute, University of Zurich)

How Much Internalization of Nuclear Risks Through Liability Insurance?

Abstract: An important source of conflict surrounding nuclear energy is that with a very small probability, a large-scale nuclear accident may occur. One way to internalize the associated financial risk is through mandating nuclear operators to have liability insurance. This paper presents estimates of consumers' willingness to pay for increased financial security provided by an extension of coverage, based on the 'stated choice' approach. A Swiss citizen with median characteristics may be willing to pay 0.2 Swiss cents per kWh to increase coverage beyond the current 0.7 billion (bn.) CHF. Marginal willingness to pay declines with higher coverage but exceeds marginal cost at least up to CHF 4 bn. An extension of nuclear liability insurance coverage therefore may be efficiency-enhancing.

9.15–9.45

Dr. Christoph Schmidhuber (Head of Risk Management, Alternative Investments and Mutual Funds, Credit Suisse)

Hedge Fund Market Risk Management

Abstract: Following the rapid recent growth of the hedge fund industry, it has become necessary to extend traditional methods of market risk management to make them suitable for hedge funds. In this talk, we identify the critical market risk factors affecting the major hedge fund strategies, and demonstrate how exposures to these factors can be estimated. We show how to compute the value-at-risk of a hedge fund portfolio, and how to attribute it to equity markets, interest rates, currencies, and commodities at a given point in time. We also discuss critical stress scenarios for the various hedge fund strategies and suggest simple stress tests, paying special attention to credit- and liquidity crises and their impact on various arbitrage strategies. Finally, we summarize the impact of different hedge fund strategies on the market risk profiles of traditional investments. This talk focuses on research and methodology that can be replicated based on public information, including daily hedge fund indices and hedge fund databases.

9.45–10.15

Coffee Break (Main Hall, F-Floor, «Uhrenhalle»)

10.15–10.45

Prof. Dr. Martin Schweizer (Department of Mathematics, ETH Zürich)

Option pricing and large investors

Abstract: We give a short overview of some problems and issues in models of financial markets with a large investor. We also present some recent results that illustrate hidden subtleties in this topic. The main focus will be on pricing by replication.

- 10.45–11.15 **Dr. Enrico De Giorgi** (Institute for Empirical Research in Economics, University of Zurich and Institute of Finance, University of Lugano)
Beta Regimes for the Yield Curve
- Abstract: We propose an affine term structure model which accommodates non-linearities in the drift and volatility function of the short-term interest rate. Such non-linearities are a consequence of discrete beta-distributed regime shifts constructed on multiple thresholds. We derive iterative closed-form formula for the whole yield curve dynamics that can be estimated using a linearized Kalman filter. Fitting the model on US data, we collect empirical evidence of its potential in estimating conditional volatility and correlation across yields.
- 11.15–11.45 **Prof. Dr. Rüdiger Frey** (Mathematical Institute, University of Leipzig, Germany)
Pricing portfolio credit derivatives in a model with interacting intensities
- Abstract: In this talk we discuss the pricing of portfolio credit derivatives such as basket swaps and CDOs in a Markovian model for default contagion, which can be viewed as alternative to the standard Gaussian copula model. In particular, we show that base correlation skews can be explained naturally in the Markov model.
- 11.45–12.15 **Dr. Rosario Dell'Aquila** (RiskLab, ETH Zürich)
Robust Data Analysis for Risk Management: Where do we stand?
- Abstract: Stochastic models play an important role in the analysis of data in many different fields, including finance and insurance. In this talk, we first briefly discuss the main robustness problems of classical statistics and the basic ideas and techniques of robust statistics and econometrics. In the second part, we will discuss the robustness issues arising in estimation, testing and model selection of some critical and complex applications in risk management, such as extreme value theory, estimation of risk models and determination of risk premia, estimation of scoring models, parametric and nonparametric yield curve modelling and fitting implied volatility surfaces. Using real data, we show how robust methods improve the data analysis process and discuss some open research issues. Finally, as a consequence, we will discuss some implications for teaching data analysis and statistics, and for the communication of research results in finance and insurance.
- 12.15–14.00 **Lunch Break**
- 14.00–14.30 **Dr. Johanna Neslehova** (RiskLab, ETH Zürich)
Modeling of dependent non-continuous random variables with applications to Poisson point processes
- Abstract: For continuous random variables, many dependence concepts and measures of association can be expressed in terms of the corresponding copula only and are thus independent of the marginal distributions. This interrelationship generally fails as soon as discontinuities are allowed. In this talk, we investigate the class of all possible copulas in the general case and show that one of its members -- the standard extension copula introduced by Schweizer and Sklar -- captures the dependence structures in an analogous way the unique copula does in the continuous case. In particular, we focus on measures of concordance and derive Kendall's tau and Spearman's rho for non-continuous random variables. We also discuss modeling of multivariate discrete distributions using copulas as well as modeling of dependent Poisson point processes with applications in operational risk.
- 14.30–15.00 **Prof. Paolo Vanini** (Swiss Banking Institute, University of Zurich and Zürcher Kantonalbank)
Aligning Capital to Risk
- Abstract: Economic capital and its allocation to business units are expected to be a major steering mechanism in modern banking. The near past showed that to simplistic approaches to capital allocation fail to be successful in reality. Two main shortcomings are unrealistic time scaling of loss figures and inappropriate risk modeling. Hence, capital turns out to be associated to risk in a non acceptable way to the risk managers. We propose two models, one for credit risk and one for market risk, which describe how capital can be aligned to risk. The models are based on the definition of risk events and a probabilistic risk budgeting procedure. Using these models, economic capital for different risk factors are unambiguously comparable for performance purposes.

- 15.00–15.30 **Coffee Break** (Main Hall, F-Floor, «Uhrenhalle»)
- 15.30–16.00 **Prof. Dr. Alexander McNeil** (Department of Mathematics, ETH Zürich)
Self-Exciting Processes for Extremes in Financial Time Series
- Abstract: The application of extreme value theory (EVT) methods to time series of financial returns has been a subject of interest in recent years. Most studies have focussed on applying static tail estimation techniques under assumptions of stationarity, such as the Hill estimator or the generalized Pareto tail approximation method. The aim of this talk is to propose a new dynamic model for the occurrence of extremes above some high threshold in a financial time series. The model attempts to describe both the temporal occurrence and the magnitude of threshold exceedances and does so by employing a point process formulation with self-exciting structure and a parameterization inspired by standard EVT models. The model is applied to financial data and used to estimate a stylized Value-at-Risk (i.e. an extreme quantile of a conditional return distribution for the next time period).
- 16.00–16.30 **Dr. Joerg Behrens** (Partner, Global Financial Services Risk Management, Ernst & Young)
Validation of Rating Models
- Abstract: With the implementation deadline of the new Basel II rules coming closer, banks now focus on the validation of their rating and scoring models. In our presentation we provide an overview of the approach to Model Validation and provide an example of measuring the accuracy of estimated default probabilities and the discriminatory power of a rating model.
- 16.30–17.00 **Graduation Ceremony** for the second cycle (2003/2005) of the Uni/ETH Zurich program Master of Advanced Studies in Finance
- Talk: **Raymond J. Bär**, Chairman of the Board, Julius Bär Holding Ltd.
From the UNI/ETH Zuerich Masters program to the financial services industry
- Laudatio: **Prof. Dr. Rajna Gibson**
- 17.00–17.15 **Official launch of the book**
Quantitative Methods for Risk Management, authors **Prof. Dr. Paul Embrechts**, **Prof. Dr. Rüdiger Frey**, **Prof. Dr. Alexander McNeil**.
- 17.15–18.15 **Apero** (Main Hall, F-Floor, «Uhrenhalle»)

General Information

Participation is free, and there is no official registration. Everyone is welcome, practitioners are especially encouraged to attend. We have not made any special arrangements for lunch since there are sufficient possibilities nearby, in particular at ETH and the University. There is also the Dozentenfoyer.

For hotel accommodation, please check the Zürich Tourism home page.

Organizers:

PD Dr. Walter Farkas (Managing Director CCFZ, ISB/Uni. Zürich and ETH Zürich)
Prof. Dr. Philipp Schönbucher (Department of Mathematics, ETH Zürich)

Conference Secretary:

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