

RISK DAY 2004

Mini-Conference on Risk Management in Finance and Insurance

organised by

RiskLab and Center of Competence Finance in Zurich

Location

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

Time

Friday, October 15, 2004, full day

Program

9.00–9.05 **Prof. Dr. Freddy Delbaen** (Department of Mathematics, ETH Zürich)
Welcome and Introduction

9.05–9.45 **Prof. Dr. Hans-Jakob Lüthi and Dr. Juri Hinz** (IFOR, Department of Mathematics, ETH Zürich)
Risk Management for Power Utilities

Abstract: Over the last decade, electric markets have been significantly restructured throughout the world by introduction of commercial interfaces between the functions of generation, transition, distribution and retailing of electrical energy. Thereby enforced competition requires reliable methods for estimation and managing risk resulting from energy production and trading. In the project 'Dispatch Management of Hydro Power Plants', we aim to provide reasonable approaches to power risk management, based on the fact that though electricity can not be stored, it can be produced, and hence the true underlying for electricity contracts is the physical ability to produce power. Consequently, the core problem in electricity risk management is to establish theoretically accounted concepts for valuation of operational flexibility. However, to obtain a correct contract pricing, we have to take into account at least two specialties. On one hand, the viewpoint of electricity retailers who are obliged to supply random electricity demand of their final consumers at fixed price. On the other hand, the fact that exchange trading of forward contracts converts physical production capacity into financial agreements, providing the toolkit of financial mathematics. First, we will give an overview on the project, the methodology employed and results obtained so far. In the second part, we elaborate on arbitrage-free valuation of financial agreements, illustrating how interest-rate methodology and change-of-numeraire are applied for pricing electricity swing options.

Project overview (9.05-9.20): Prof. Dr. H.-J. Lüthi
Arbitrage free valuation (9.20-9.45): Dr. Juri Hinz

9.45–10.30 **Prof. Dr. Claudia Klüppelberg** (Center for Mathematical Sciences, Munich University of Technology)
Modelling, Estimation and Visualization of Multivariate Dependence for Risk Management

Abstract: Dependence modelling and estimation is a key issue in the assessment of any portfolio risk. When measuring extreme risk in terms of the Value-at-Risk, the multivariate normal model with linear correlation as its natural dependence measure is by no means an ideal model. We suggest a large class of models and a dependence function which allows us to capture the complete extreme dependence structure of a portfolio. The dependence function is compared to other models for dependence, as e.g. the copula for uniform models and the spectral measure for regularly varying models. We also present a simple nonparametric estimation procedure and apply it to a financial data set to estimate the extreme dependence in the data.

References:

- Hsing, T., Klüppelberg, C. and Kuhn, G. (2003) Modelling, estimation and visualization in multivariate extremes with applications to financial data. *Extremes*. To appear
- Hsing, T., Klüppelberg, C. and Kuhn, G. (2003) Modelling, estimation and visualization of multivariate dependence for risk management. Submitted for publication
- Lindner, A. and Szimayer, A. (2004) Comparing dependence concepts in multivariate extreme value theory. In preparation

10.30–11.00 **Coffee Break** (Main Hall, F-Floor, «Uhrenhalle»)

11.00–11.30 **Prof. Dr. Markus Leippold** (Swiss Banking Institute, University of Zurich)
A Simple Model of Credit Contagion

Abstract: In this joint work with Daniel Egloff (ZKB) and Paolo Vanini (ZKB and University of Zurich) we propose a simple and implementable model of credit contagion where we include macro- and microstructural dependencies among the debtors within a credit portfolio. We show that, even for diversified portfolios, moderate microstructural dependencies have already a significant impact on the tails of the loss distribution. This impact increases dramatically for less diversified microstructures. Since the inclusion of microstructural dependencies acts on the tails, the choice of an appropriate risk measure for credit risk management is a delicate task. We also show possible ways to improve the numerical procedures to obtain better tail approximation.

11.30–12.00 **Philippe Ehlers** (Department of Mathematics, ETH Zürich)
Influence of FX Risk on Foreign Currency Denominated Bonds and CDSs

Abstract: Many non-US-based obligors issue debt in both domestic and foreign (usually US\$) currency. If FX and default risk (and interest rate risk) are nonindependent, domestic and foreign credit spreads will not be equal. We consider the following sources of this dependence: before default FX rate and default intensity may be correlated and at default there may be a jump in the FX rate, i.e. one of the currencies is devaluated. Our model is set in an affine jump diffusion framework. We derive bond and CDS price under various recovery assumptions and present an empirical analysis of JPY and US\$-denominated CDS rates on Japanese reference entities.

12.00–14.00 **Lunch Break**

14.00–14.30 **Dr. Peter Buomberger** (Director, Center for Corporate Responsibility and Sustainability, University of Zurich)
New Risks Springing from the Increased Responsibility of Transnational Corporations for Human Rights

Abstract: Under the combined pressure of civil society organisations, governmental authorities, international organisations as well as some corporations, a debate on the human rights responsibilities of transnational corporations (TNCs) is now well under way. This debate is fostered by the view that the respect and protection of human rights is not just a matter for states, but is in fact the responsibility of every organ of society, including corporations. A substantial number of companies have already started to address human rights issues, and strive to respect global human rights principles embedded in newly-established internal codes of conduct in their daily operations. By 1998, 57% of the largest UK companies had established such codes. The rationale for these corporate strategies is to mitigate scrutiny by pressure groups, raise corporate profile, protect and enhance brand value and improve supply chain management and employee productivity, among other social and commercial benefits. This evolution raises a new critical question: what are the responsibilities and risks with regard to human rights? As for any issue of corporate social responsibility, answering this question is crucial in harnessing the power of TNCs. Stakeholders must have a sense of where these boundaries lie to be effective and efficient in monitoring corporate behaviour; and corporate executives need an answer in order to set clear policy objectives in response to the expectations they face.

14.30–15.00 **Prof. Dr. Marc Chesney** (Swiss Banking Institute, University of Zurich)
Stock Options and Managers' Incentives to Cheat

Abstract: In this joint work with Rajna Gibson we use a continuous-time contingent claims framework to study managers' incentives to cheat in the presence of equitybased compensation policies. When we consider a fully predictable legal process, we observe that managers will always have incentives to engage in illicit activities. The exercise of the option to cheat will be postponed if the corruption costs or if the manager's reputational loss increases. We further show that managers incentives to cheat are delayed and can even be eliminated when the legal settlement date is nonpredictable. An important result is that managers will always cheat sooner with stock options than with a cash equivalent remuneration consisting of stocks. Finally, we propose a new remuneration package that consists of both long calls and short puts written on the firm's stocks in order to reduce managers incentives to cheat.

- 15.00–15.30 **Dr. Christian Bluhm** (Head of Credit Portfolio Management, Credit Suisse)
A Survey on Default Timing
- Abstract: In the "early times" of quantitative credit risk management people typically considered (cumulative) default distributions with respect to a given fixed time horizon. Some years ago people started to look at so-called correlated default times, focussing more on the exact timing of defaults instead of just counting the number of defaults occurring in a certain time period. Because correlated default times are based on a combination of a term structure of default probabilities with a copula function, the correlated default times framework is also called the copula approach. For structured credit transactions like basket credit derivatives and collateralized debt obligations, the copula approach is kind of a best practice today. It is the scope of the talk to consider different aspects of default timing in a survey-like style, giving special emphasis to examples and problems.
- 15.30–16.00 **Coffee Break** (Main Hall, F-Floor, «Uhrenhalle»)
- 16.00–16.30 **Abdel-Yazid Djaidja** (Quantitative Analyst, Swiss Union of Raiffeisen Banks)
Applying Survival Analysis under Extreme Censoring for Modeling Retail Default Risk
- Abstract: Modeling credit risk for retail clients by some traditional approaches, as for example the firm's value model of Merton, is not appropriate. The lack of idiosyncratic information about the counterparty has to be taken into account when modeling credit risk for retail clients. Another feature of credit default for retail client data is the extremely low level of default rates. In this talk we present a statistical model based on survival analysis under extreme censoring for the time-to-default variable. This model incorporates the stochastic nature of default via a reduced form approach. Estimation and asymptotic results are based on maximum likelihood techniques. Data examples on mortgage portfolios illustrate the method.
- 16.30–17.00 **Graduation Ceremony for the first cycle (2002/2004) of the Uni/ETH Zurich program Master of Advanced Studies in Finance**
- Talk: **Dr. Marcel Rohner** (CEO Wealth Management and Business Banking, UBS)
How to build a career in Finance – from the UNI/ETHZ Masters program to the financial services industry
 - Laudatio: **Prof. Dr. Rajna Gibson**
- 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: <http://zurichtourism.ch/>

Organizers:

PD Dr. Walter Farkas (Director CCFZ, ISB, Uni. Zürich and ETHZ)

Prof. Dr. Philipp Schönbucher (Department of Mathematics, ETH Zürich)

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