RiskLab® Switzerland

Center of Competence Finance in Zurich

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RISK DAY 2007

Risk Management in Financial and Energy Markets
Industry Day at the International Congress on Industrial and Applied Mathematics, ICIAM 2007

July 19, 2007

Organizers
For the Center of Competence Finance in Zurich
Walter Farkas, farkas@math.ethz.ch
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Location and Time
ETH Zürich, Main Building, Rämistrasse 101, 8092 Zürich, Lecture Theatre HG F5
Thursday, July 19, 2007, full day

Important information concerning registration:
This Industry Day within ICIAM 2007 is sponsored by the Chair of Financial Mathematics from ETH Zurich, Prof. Freddy Delbaen, and is therefore free of charge for those who register before July 17, 2007. electronic registration: www.ccfz.ch/register2007_riskday

Interested participants who are already registered participants at the ICIAM 2007 do not need to register for this Industry Day!

Unregistered participants at the ICIAM 2007 and unregistered participants at the Risk Day 2007 are also welcome to attend, but they will need to pay CHF 100 in cash. This cash payment has to be done at the ICIAM 2007 Congress Office located that day in the main building of the University of Zurich, room KOL-F-103, Rämistrasse 71. This is due to the fact that the ICIAM 2007 will have about 3,000 participants and there are security reasons that require a registration of the people.

Program

08.00-08.40 Registration: at ICIAM 2007 Congress Office located that day in the main building of the University of Zurich, room KOL-F-103, Rämistrasse 71.

08.45-09.30 *Prof. Dr. Nicole El Karoui* (Ecole Polytechnique, Palaisseau)

Dynamic risk measures and optimal risk transfer in financial markets

Prof. Nicole El Karoui is ICIAM Invited Speaker. Her lecture is closely related to mathematical aspects of risk management and will provide an excellent start of the Risk Day 2007.

The program of this Industry Day is as follows:

09.45-10.30 ***Dr. Simone Farinelli,*** Credit & Country Risk Control, UBS, Zurich, Switzerland
simone.farinelli@ubs.com

Generation of Consistent Market and Credit Scenarios: The Calibration of a Geometric Model

Abstract: A scenario generator for both market and credit risk drivers is developed. On the basis of historical data, financial time series are projected into the future. The foundations were given in 1998 by Andrew Smith, who developed a coherent mathematical framework applicable to all stochastic investment models, allowing for features commonly believed to be essential and/or desirable: positive interest rates, mean reversion (where appropriate), full term structures, efficient markets, absence of arbitrage.

The model consists in two parts:

- a geometrical part, where the concepts of gauge, deflator and term structure for every quantity modelled is introduced, and
- a stochastic part, where a stochastic model is applied to a minimal set of gauges (called principal gauges) to generate the scenario simulations. The stochastic part is calibrated for the special choice of a VARMA model.

10.30-11.15 **Coffee break**

11.15-11.55 *Dr. Jens Wiedmann,* LGT Capital Management, Pfäffikon, Switzerland
jens.wiedmann@lgt.com

Tests of Covariance Matrices

Abstract: How can be decided, which kind of estimator of covariance matrices is more suitable to reflect the expected portfolio risk. A kind of Maximum-Likelihood-test is introduced for solving this problem. Some concrete test results concerning different bond portfolios are shown. For these bond portfolios the simple historic covariance matrix and covariance matrices of two-factor- and three-factor-models have been tested.

11.55-12.35 *Prof. Dr. Hans-Jürgen Wolter,* CRO and Chief Actuary, Swiss Life, Switzerland
HansJuergen.Wolter@swisslife.ch

Risk-based Capital Models in Life Insurance

Abstract: A number of recent initiatives such as the preparation for Solvency II for instance have led to an increase in the extent to which insurance companies manage their risk and capital. Until now, economic capital models have been developed by the best part of the global insurance industry; it is no longer the domain of the sophisticated insurance undertakings. And yet the design of economic capital models is still under way. The aim of this talk is to discuss the characteristics of proper capital models. Often, the requirements are controversial. A model that is impeccable from a conceptual point of view might be hard to implement. We conclude with some remarks on risk measurement, motivated by the fact that some European insurance regulators have begun to demand for multi-period risk measures.

12.35-13.15 *Dr. Jörg Behrens,* Partner, Head of Financial Risk Management Central Europe, Ernst & Young
joerg.behrens@ch.ey.com

Strategic Risk Management: Ideas and Questions

Abstract: While risk management is highly sophisticated and forms an integral part of the financial services industry, most firms still struggle to benefit from their analytical know-how when it comes to strategic planning. We discuss problems and ideas to bridge the gap between the two worlds.

13.15-14.30 **Lunch Break**

14.30-15.15 *Dr. Oleg Zakharov,* General Manager Europe, Lacima Group, U.K.
oleg@lacimagroup.com

In Full Swing: Optimizing Portfolios of Flexible Gas Contracts

Abstract: After presenting a brief history of gas markets and the origin of swing contracts we discuss realistic examples of swing contracts and Stochastic Dynamic Programming approaches in optimizing a single swing contract.
Further topics treated are the importance of hedging in forward markets and liquidity considerations and the value optimization conditional on limited risk.

15.15-15.45	*Dr. Alexander Boogert,* Essent Trading BV, The Netherlands Alexander.Boogert@essent.nl

Gas Portfolio and Transport Optimization

Abstract: The transport of natural gas has received significant attention in the last months with the large price spikes in the UK facing sudden cold weather and the flow stop from Russia to Ukraine. Transport is a necessity in a world where gas sources are far removed from the gas demand, and in which a gas portfolio easily spans several countries. Meanwhile, the range of options within a gas portfolio is growing with an increasing number of instruments and increasing international gas trading. This has led to a situation where decisions have become non-trivial. The objective of this article is to describe the construction of an integrated approach for gas portfolio and transport optimization.

15.45-16.30 **Coffee break**

16.30-17.15 *Prof. Dr. Yves Smeers,* Universite Catholique de Louvain & Electrabel, Belgium
smeers@core.ucl.ac.be

Investment models in restructured electricity markets subject to risk

Abstract: Capacity expansion optimization models dominated the area of investment in generation during the former days of the regulated electricity sector. These models have lost some of their appeal today and other tools , some inspired by the theory of real options, have replaced them. We reconsider the old capacity expansion model that we expand into equilibrium models in a risky environment. For the sake of tractability and robustness we assume no market power. We first model risk by assuming firms with different cost of capital; this equilibrium model deviates minimally from the usual capacity expansion model (which assumes a single cost of capital). Alternatively we also consider that the risk attitude of firms is represented through risk functions; this forces one to consider a stochastic equilibrium model. We compare the approach to equilibrium (not optimization) models of the real option type.

20.00-21.00 *Prof. Ivar Ekeland,* ICIAM Public Lecture

The best of all possible worlds: the idea of optimization

Prof. Ivar Ekeland is ICIAM Invited Speaker. His lecture will provide an excellent finish of the Risk Day 2007.

The Speakers:

Simone Farinelli holds a PhD in Mathematics from the Swiss Institute of Technology in Zurich (ETHZ) and works for UBS Credit & Country Risk Control. His main research interests include asset liability management, portfolio optimization, fixed income modelling and credit risk.

Jens Wiedmann works in the Quantitative Research at LGT Capital Management. He is also responsible for the optimisation of global bond portfolios and for the bond risk models. He holds a Ph.D. in mathematics and started at LGT nine years ago.

Hans-Jürgen Wolter is Chief Risk Officer and Chief Actuary at SwissLife and Professor for Financial Markets at the University of St. Gall in Switzerland.

Jörg Behrens is a partner of Ernst & Young in Switzerland and leads their Financial Risk Management practice in Central Europe. Prior to joining Ernst & Young, Jörg has led the Quantitative Risk Team of Andersen in Zürich, a position he assumed after 7 years with UBS in investment banking and risk management based in London and Zürich. He received his Ph.D. for his research in particle physics at ETH Zurich/CERN.

At Lacima Group, ***Oleg Zakharov*** is responsible for developing new business opportunities and for supporting existing clients. He has over 17 years academic and industry experience, 8 of those in the energy and financial industry advising on risk management and pricing methods to developing and implementing risk management and trading systems. Before joining Lacima he was VP, Financial Engineering at KWI where he advised gas and power market players on risk management issues and was responsible for the analytical content of a multi-commodity trading and risk management system. Prior to that, he held positions with a number of banks and commercial organisations developing and commercialising market and credit risk systems. Oleg has an MSc in Computer Science and a PhD in Physics from the University of California at Berkeley.

Alexander Boogert works as a quantitative analyst at Essent Energy Trading BV in the Netherlands. In this role he provides quantitative support to the Risk Management department, while performing long-term research. Previous research includes the modelling of short-term electricity prices from the stochastic (mean-reverting jump diffusion) and economic (supply-demand) perspective. Currently his attention is focussed on the valuation of physical storage and the modelling of forward curve movements.

Yves Smeers is Professor of Industrial Engineering at the faculty of Applied Sciences of the Universite Catholique de Louvain, in Belgium. He is also Scientific Adviser to the Belgian power company Electrabel. An engineer and an economist by background Yves Smeers has been working in energy modelling now for more than 25 years. His initial interests in the field dealt with global multi-energy models. In the last ten year he has been concentrating on problems related to restructuring. He currently works on models of market power, transmission pricing, and risk management in the gas and electricity industriesHe currently works on models of market power, transmission pricing, and risk management in the gas and electricity industries.

Center of Competence Finance in Zurich (CCFZ):

The Center of Competence Finance in Zurich (CCFZ) is an internationally oriented, interdisciplinary competence center jointly run by the University of Zurich and Swiss Federal Institute of Technology in Zurich (ETH) and can draw on the expertise of more than 45 academic chairs from the two institutions, mainly in the areas of finance, financial mathematics, insurance, economics, law and computer sciences.

The objective of the Center of Competence Finance in Zurich is to support and to coordinate the relevant research and teaching activities of the University and ETH. It is the knowledge transfer platform of the two universities and supports cooperation with other partners in academia and the financial industry. In addition, the CCFZ serves as an information platform and a hub for the financial service sector, regulatory authorities and the public at large. See http://www.ccfz.ch

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Please send comments and suggestions to Walter Farkas, email: farkas@math.ethz.ch.