Risk Management, Solvency II and Swiss Solvency Test

Dr Gerhard Stahl

10th September (6h)

Jolanta Tubis

11th September (6h)

Abstract (Day 1):

- Myth and truth of the standard formula of Solvency II

This talk provides an analysis of the mathematical structure of the standard formula. The axiomatic aspects of the SCR based on the standard formula will be analyzed in depth. Furthermore, the stochastic model related to the standard formula is analyzed. Furthermore, the changes of the standard formula related to the various stages of the QIS-Studies is analyzed.

The talk will provide practical insights that are necessary to deal with the ORSA and related regulatory requirements. It also sheds critical light to the EIOPA paper on the assumptions of the standard formula.

- Building an internal model for operational risks based on elicitation techniques

The operational risk model is based on subjective probabilities. The talk will give an overview of the structure of the oprisk model, the underpinning processes and experiences with the regulatory authority.

- Model Uncertainty

With this talk, an overview of the structure and amount of model uncertainties for internal models is given. We will differentiate between epistemic, aleatory and numerical uncertainties. A special emphasis is given on the impact of the number of Monte-Carlo-Simulations in the context of an internal model.

Prof. Dr. Gerhard Stahl holds the position of the Chief Risk Officer and heads the Group Risk Management of the Talanx Group. He has studied mathematics at the TU Karlsruhe. From 1995 to 2007 he was with the Federal Financial Supervisory Authority (BaFin). Until 2007 he headed the Risk Modelling Group (QRM), the unit of the BaFin that is in charge for on-site inspections of risk management models. He was assigned to represent the BaFin in several working groups in Basel and CEBS, the Committee of European Banking Supervisors. Prior to joining the BaFin he had been a research fellow at the Economic Faculty of Heidelberg. He was a member of the Advisory Board of the CASE Institute at Humboldt and the Fellow of the Centre for Financial Studies, Frankfurt. He holds an honorary doctor (Dr. rer. pol. h. c.) from the University of Bamberg for his scientific contributions to financial risk management. Since 2008 he is adjunct professor at the University of Ulm and since 2010 at the University of Hanover.

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Jolanta Tubis

11th September (6h)

Abstract (Day 2):

The SST was developed by the Swiss Financial Market Authority FINMA and applies an economic, risk-based view to determine how much capital is required vs. how much is available for an insurance/reinsurance company.

The course offers an introduction on the Swiss Solvency Test (SST) including its role in the regulatory framework, it's external and internal uses, and provides guidance on how to interpret the SST ratio and its drivers.

The course explains the principles of SST established by FINMA, shows how to determine capital requirements using standard or internal models and provides a comparison with the SII framework.

Jolanta Tubis holds a master's degree in mathematics from University of Warsaw, Poland. She has more than 20 years of industry experience in various actuarial and risk management positions. She has a high degree of knowledge of the economic capital regulatory frameworks (Swiss Solvency Test and Solvency II), including experience in risk modelling, aggregation and reporting. In her current role as a Head of Risk Governance & Assurance at Swiss Re she is responsible for setting standards for the risk aggregation process, quality assurance for the risk and capital reporting and continuous improvement or risk governance.

Generatory scenariuszy ekonomicznych – koncepcja, modele i zastosowania

Dr Grzegorz Darkiewicz-Moniuszko

12th September (6h)

Streszczenie:

1. Wprowadzenie do generatorów scenariuszy ekonomicznych

2. Porównanie scenariuszy *risk neutral* do scenariuszy *real world*

3. Walidacja scenariuszy ekonomicznych

4. Podstawy metod Monte-Carlo i ich zastosowania w finansach

5. Modele stosowane przy generowaniu scenariuszy

a) Modele stopy procentowej

b) Modele indeksów (na przykład akcji)

c) Inne czynniki ryzyka: ryzyko kredytowe, inflacja, ryzyko kursu walutowego

d) Modelowanie zależności między czynnikami ryzyka

6. Zastosowania scenariuszy ekonomicznych

a) Wycena kosztu opcji i gwarancji

b) Solvency II: wyliczanie BEL i wymogów kapitałowych za pomocy formuły standardowej

c) Asset-Liability Management

d) Modele wewnętrzne / metody *proxy*: portfele replikujące, *Least-Squares Mote-Carlo* oraz *curve fitting*

Grzegorz Darkiewicz-Moniuszko jest absolwentem Wydziału Matematyki, Informatyki i Mechaniki Uniwersytetu Warszawskiego, a w 2005 roku obronił doktorat z ekonomii stosowanej na Katolickim Uniwersytecie w Leuven (Belgia). Obecnie pracuje jako Starszy Konsultant w Milliman, gdzie jest odpowiedzialny za Research and Development we Włoszech i Europie Środkowo-Wschodniej. Posiada licencję aktuarialną i jest członkiem Polskiego Stowarzyszenia Aktuariuszy. Przed dołączeniem do Milliman w 2011 roku Grzegorz pracował w Belgii w grupie KBC w działach zarządzania ryzykiem oraz zarządzania aktywami. Grzegorz specjalizuje się w zagadnieniach związanych z Solvency II, ryzykiem finansowym oraz ALM, głównie w ubezpieczeniach życiowych. Posiada bogate doświadczenie w implementowaniu modeli generujących scenariusze ekonomiczne, modelowaniu stóp procentowych oraz wycenie rynkowej zarówno ubezpieczeniowych opcji i gwarancji jak i produktów strukturyzowanych. Grzegorz jest autorem bądź współautorem kilku publikacji naukowych, które ukazały się w międzynarodowych czasopismach takich jak „*Insurance: Mathematics and Economics*" oraz „Journal of Risk and Insurance". Wygłaszał również wiele wykładów aktuarialnych (między innymi dla Polskiego Stowarzyszenia Aktuariuszy oraz w ramach seminariów EAA).

Statistical Techniques in Non-life Insurance Pricing

Xavier Maréchal

13th-14th September (12h)

Abstract:

The aim of this course is to present some actuarial/statistical/data science techniques used in non-life pricing, competition analysis and profitability analysis.

Attendees are encouraged to bring a laptop computer with R installed as well as some useful packages (all the information will be provided after subscription). A basic knowledge of the R software is useful.

The agenda of this 2-days course is the following

- Basics of Non-Life Pricing (GLM for frequency and severity modelling, GAM for continuous variables and geographical ratemaking)
- Machine learning techniques in non-life pricing (regression trees, boosting, etc.): methodology and examples
- Machine learning techniques in non-life pricing: case study performed by the participants
- Penalized regression techniques (Lasso, Ridge, interaction detection,…): methodology and examples
- Competition analysis: reverse engineering of competitors prices and positioning assessment with regression trees
- Client behavior and elasticity
- Profitability analysis with regression trees and heatmaps.

Xavier Maréchal is founder and CEO of Reacfin, a spin-off from the University of Louvain (Louvain-la-Neuve, Belgium) active in actuarial, financial and data science consulting, tool development and training. Xavier is one of the co-authors of "Actuarial Modeling of Claim Counts: Risk Classification, Credibility and Bonus-Malus Systems" (Wiley, 2007). Xavier has obtained different academic degrees as Master in Engineering (Applied Mathematics), MSc. Actuarial Sciences and MSc. Management. Xavier is a qualified actuary of the Institute of Actuaries in Belgium (IA|BE). Xavier has extensive experience in the actuarial field obtained during his 14 years as a principal consultant for many national and multinational insurance companies. He has gained a complementary experience in various fields going from Non-Life ratemaking and provisioning to life modeling and ALM but has specialized in Non-Life over the past few years