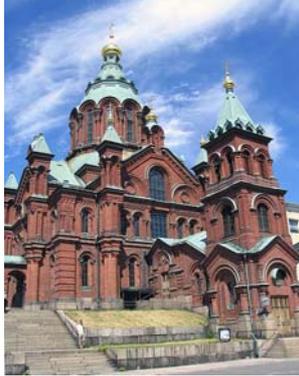




Seminar  
**“Stochastic Modeling – Theory and Reality from an Actuarial Perspective”**

27-29 November 2012 | Helsinki / Finland



organised by the EAA - European Actuarial Academy GmbH in cooperation with the Suomen Aktuaariyhdistys

### 1. Introduction

As recently as the mid-1990s, most models used in financial analysis of insurance were deterministic. Based on sets of static parameters and assumptions, these models largely ignored random fluctuations that were likely to occur. Sensitivity analyses were performed but were generally limited to a fixed number of defined scenarios. This deterministic approach is rapidly being replaced by stochastic modeling that can better inform insurers on pricing, financial planning, and capital assessment strategies. Huge advancements in computing power have made it possible for actuaries and financial planners to better understand the increasingly complex risk profiles of insurers' evolving product design.

This seminar is based on the book “Stochastic Modeling – Theory and Reality from an Actuarial Perspective (copyright © 2010 International Actuarial Association) which intends to provide actuaries with a comprehensive resource that details current stochastic methods, provides background on the stochastic technique as well as their advantages and disadvantages.

### 2. Participants

The seminar is suited for actuaries, actuarial students and other professionals involved and interested in actuarial modeling in life and non-life.

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### 3. Purpose and Nature

The seminar will cover a wide range of topics presented in the book “Stochastic Modeling – Theory and Reality from an Actuarial Perspective”. The first day of the seminar will focus on risk management and actuarial modeling issues. The day will start with an introduction to stochastic modeling, including a practical discussion of when stochastic models are appropriate or necessary and when they may not be. The day continues with an in-depth discussion of the various techniques and models that are commonly used in stochastic projections.

The second day (and the morning of the third day) of the seminar will be split into two separate sessions, one that will focus on life actuarial issues and the other will focus on non-life actuarial issues. In the life session, the lecturers will present stochastic models for interest rates, mortality, and morbidity, among other risk factors, and will demonstrate how these models can be developed, calibrated, implemented and reviewed. This will also involve a detailed case study (or case studies) illustrating the use of stochastic models in life and health business.

In the non-life sessions, the lecturers will present an overview of stochastic models, including triangle based, frequency / severity, catastrophe financial and dynamic risk models, and will demonstrate how these models can be developed, calibrated, implemented and reviewed. Building on this overview, the lecturers will then take you through a deeper look at the Mack and ODP Bootstrap models and discuss the calculation of one-year reserving risk. As with the life session, the early sessions will focus on the technical aspects of stochastic models and the later sessions will be a case study format intended to demonstrate the practical application of these models.

The third day will continue the separate life and non-life sessions in the first session. In the later sessions we will again have a joint session to discuss a concluding case study.

All participants will receive a copy of the book “Stochastic Modeling – Theory and Reality from an Actuarial Perspective” which is presented by the International Actuarial Association (IAA) in collaboration with Milliman. A guide for practitioners interested in understanding this important emerging field, this book presents the mathematical and statistical framework necessary to develop stochastic models in any setting (insurance or otherwise). Sufficient mathematical detail is presented but no advanced background in mathematics or statistics is required.



### 4. Lecturers

#### Andrew H. Dalton

Is an Actuary in Milliman’s Philadelphia office and a primary author contributing to Life sections of the book “Stochastic Modeling – Theory and Reality from an Actuarial Perspective”. Andrew’s professional experience includes work on actuarial appraisals for mergers and acquisitions, asset and liability analysis, cash flow testing, and economic capital for life and health companies. Andrew is a Fellow of the Society of Actuaries and a Member of the American Academy of Actuaries. He holds a Masters

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Degree in Business Administration, concentrating in Finance and Statistics, from the Leonard N. Stern School of Business of New York University.

### **Mark R. Shapland**

Is a Consulting Actuary in Milliman's Atlanta office and a primary author contributing to Non-Life sections of the book. Mark's area of expertise is non-life insurance, particularly pricing (personal and commercial lines), reserving (including reserve variability and asbestos liabilities), individual risk and association-type dividend plans and premium rates for large accounts, reinsurance, data management, and dynamic risk modeling. Mark has international experience, having worked in Europe for four years, as well as shorter assignments in many other countries. He also has extensive experience in the development of actuarial software tools and is the lead actuary for the Milliman Reserve Variability software development team. Mark is a Fellow of the Casualty Actuarial Society, an Associate of the Society of Actuaries and a Member of the American Academy of Actuaries.

### **Jeffrey A. Courchene**

Jeff's area of expertise is international property and casualty insurance: particularly reserving, reinsurance analysis, mergers and acquisitions (M&A) activity, advanced pricing techniques, and dynamic financial modeling. Jeff has extensive experience in matters related to both personal and commercial lines of business in the United States, United Kingdom, Middle East, and continental Europe. His experience includes leading the review of reserves of various European (re)insurers as part of due diligence assignments, leading dynamic financial modeling projects both in the United States and Europe, and contributing to Milliman internal Solvency II working party as an author and presenter. Jeff is a Fellow of the Casualty Actuarial Society and a Member of the American Academy of Actuaries.

### **Dr. Michael Leitschkis**

Michael specializes in modelling financial and insurance risks of life insurance. He advises his clients on various aspects of risk modelling and risk management in the context of Solvency II. Michael has several years of experience in the German market, with his work involving Solvency II implementation, industrialization and model change processes, calculation and review of MCEV, and risk aggregation. Michael has presented several talks to German actuarial conventions, and acts as a lecturer on risk modelling within the German CERA syllabus.

### **Dr. Mario Hoerig**

Mario specializes in modelling financial and insurance risks of life insurance. He advises his clients on risk aggregation, asset modelling, Solvency II implementation, and calculation of MCEV. Mario has given several talks on risk aggregation techniques such as Least Squares Monte Carlo at actuarial seminars.

## **5. Language**

The language of the seminar will be English.

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## 6. Preliminary Programme

### Tuesday, 27 November 2012

	<b>Joint Session (Andrew Dalton)</b>
08.45 – 09.00	Registration
09.00 – 09.20	Welcome and opening of day 1
09.20 – 10.30	Introduction to Stochastic Modeling – when should it be used? Technical Background for Stochastic Modeling: Stochastic Techniques Monte Carlo Simulation Binomial Models Introduction to Interest Rate Models
10.30 – 10.45	Coffee break
10.45 – 12.30	Technical Background for Stochastic Modeling – Continued: Mortality models Lapse Rate Models Claim continuance and termination models Practical Application of Stochastic Models: Financial Projections Valuation
12.30 – 13.30	Lunch
13.30 – 15.00	Applications of Stochastic Modeling (Applicable to All Practice Areas) Interest Rate Case Study Selection of interest rate generator Calibrating the model Generating scenarios Demonstrate use of model with option pricing example Participants will work on Excel-based examples
15.00 – 15.15	Coffee break
15.15 – 17.00	Applications of Stochastic Modeling (Applicable to All Practice Areas) Credit Risk Case Study Selection of the model Calibrating the model Projection of default costs Participants will work on Excel-based examples
approx. 18.00	Dinner

### Wednesday, 28 November 2012

#### Life Session (Mario Hoerig / Michael Leitschkis)

09.00	Opening of day 2
09.00 – 11.00	Theoretical background of Mortality models and Lapse models Mortality models Lapse Rate Models
11.00 – 11.15	Coffee Break
11.15 – 13.00	Case Studies: Mortality and Lapse

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Case Study 1: Mortality  
Case Study 2: Dynamic Policyholder Behavior  
Policyholder Behavior for Traditional and Unit-Linked Policies  
Policyholder Behavior and Economic Balance Sheet

13.00 – 14.00	Lunch
14.00 – 15.15	Introduction to Risk Aggregation Techniques in the Solvency II Context Modern Approach: Least Squares Monte Carlo (LSMC) General Introduction Fitting of Polynomial Liability Function Validation of Results
15.15 – 15.30	Coffee break
15.30 – 17.00	Case Study: Economic Capital via Least Squares Monte Carlo Application of LSMC to a Stochastic Model Choice of Risk Drivers Interpretation of Risk Dependencies: Interest Rates vs. Lapses Evaluation of Probability Distributions Comparison to Standard Formula

### **Non-Life Session (Jeff Courchene / Mark Shapland)**

09.00	Opening of day 2
09.00 – 11.00	Introduction to Non-Life Stochastic Models Non-Life Claims Models Triangle-based Models Frequency/Severity Models Catastrophe Models Non-Life Financial Models Non-Life Dynamic Risk Models
11.00 – 11.15	Coffee break
11.15 – 13.00	A Deeper Look / Hands On Approach (ODP Bootstrap)
13.00 – 14.00	Lunch
14.00 – 15.15	Applications of Stochastic Modeling (Non-Life Insurance) Case Study 1 (Reserve Variability)
15.15 – 15.30	Coffee break
15.30 – 17.00	Applications of Stochastic Modeling (Non-Life Insurance) Case Study 2 (GLM Bootstrap) Case Study 3 (Solvency II)
approx. 18.00	Social Event

### **Thursday, 29 November 2012**

#### **Life Session (Andrew Dalton)**

09.00	Opening of day 3
09.00 – 10.30	Applications of Stochastic Modeling (Life Insurance) Case Study – Long-tailed health insurance

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	Case Study – Economic Capital for Multi-Line Life Insurance Company
10.30 – 10.45	Coffee Break
	<b>Non-Life Session (Jeff Courchene / Mark Shapland)</b>
09.00	Opening of day 3
09.00 – 10.30	Applications of Stochastic Modeling (Non-Life Insurance) Case Study 4 (Back-testing and Validation) Case Study 5 (Predictive Modeling & Pricing)
10.30 – 10.45	Coffee Break
	<b>Joint Session (TBD)</b>
10.45 – 12.30	Joint Life/Non-Life Case Study focusing on senior management perspective
12.30 – 12.45	Concluding remarks
12.45 – 13.45	Lunch

Attendees are encouraged to bring a laptop computer with Microsoft Excel installed.

## 7. Fees & Registration

Please register for the seminar as soon as possible because of the expected demand. If there are more persons interested in this seminar than places available we will give priority to the registrations received first. Please send your registration as soon as possible by using our online registration form at [www.actuarial-academy.com](http://www.actuarial-academy.com).

Your registration is binding. Cancellation is only possible up to 4 weeks before the first day of seminar. If you cancel at a later date, the full seminar fee is due. You may appoint someone to take your place, but must notify us in advance. EAA has the right to cancel the event if the minimum number of participants is not reached.

Please always give your invoice number when you effect payment. Bank charges are to be borne by the participant. We will send you an invoice, please allow a few days for handling.

**Your early-bird registration fee is €870.00 plus 23 % VAT until 12 October 2012. After this date the fee will be €970.00 plus 23 % VAT.**

## 8. Accommodation / Venue

The seminar will take place at  
The Finnish Centre for Pensions  
Kirjurinkatu 3 (Itä-Pasila)  
Helsinki, Finland



**Finnish Centre for Pensions**  
ELÄKETURVAKESKUS

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ASSOCIATION ACTUARIELLE INTERNATIONALE

European Actuarial Academy  
developing actuaries



Hotel in walking distance:

Holiday Inn Helsinki Exhibition and Convention Centre Messukeskus  
Messuaukio 1  
00520 Helsinki, Finland

Tel: + 358 9 150 900

Fax: + 358 9 150 901

Email: helsinki.holidayinn@restel.fi

We arranged an allotment at the Holiday Inn Messukeskus. The price for a single room is 130 € per night, including breakfast, morning- and evening sauna, use of gym and all taxes. This price is valid for bookings before 1 November 2012 out of our allotment (reference "European Actuarial Academy Allotment"). Kindly book your accommodation as soon as possible directly with the hotel, as our allotment includes only a limited number of rooms, and note the hotel's cancellation policy.

## 9. CPD

For this seminar, the following CPD points are available under the CPD scheme of the relevant national actuarial association:

Austria: 16 points

Bulgaria: 12 points

Belgium: 16 points

Czechia: 2-3 points (individual accreditation)

Estonia: 16 hours

Germany: 16 hours

Italy: approx. 4 credits (GdLA individual accreditation)

Netherlands: approx. 14 PE-Points (individual accreditation)

Russia: 40 points

Slovakia: 8 points

Slovenia: 50 points

Switzerland: 15 points

No responsibility is taken for the accuracy of this information.

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