

# 48<sup>th</sup> Actuarial Research Conference

**Temple University  
Alter Hall  
1801 Liacouras Walk  
(Between Broad and Montgomery and 13<sup>th</sup> Streets)  
Philadelphia, PA  
July 31-August 3, 2013**

## DETAILED PROGRAM

### July 31, Wednesday

- 17:00-19:30** **Welcome Reception**  
Courtyard Marriott Hotel  
21 N. Juniper Street, Philadelphia, PA
- 20:00-20:20** **Bus Transportation: Marriott to Temple Dormitory,  
1300 Residence Hall, 1300 Cecil B. Moore Avenue**  
(You must be on the bus by 20:00.)

### August 1, Thursday

- 7:30-7:50** **Bus Transportation: Marriott to Alter Hall**  
(You must be on the bus by 7:30.)
- 8:00-8:25** **Breakfast in Alter Hall, 1<sup>st</sup> Floor, Ticker Area**
- 8:25-9:30** **Opening Session, Auditorium, Alter Hall, Lower Level**
- Introduction
- Dean Moshe Porat  
Fox School of Business, Temple University*
- Dr. R.B. Drennan, Chair  
Department of Risk, Insurance, and Healthcare Management  
Temple University*
- Keynote Presentation
- Longevity Risk  
*Steven Haberman  
Cass Business School*

9:30-10:20 **Plenary Session I**, Auditorium, Alter Hall, Lower Level

Actuarial Education

Moderator:

*Stuart Klugman, The Society of Actuaries*

Panelists:

*Ron Gebhardtsbauer, Penn State University*

*Richard W. Gorvett, University of Illinois at Urbana-Champaign*

*Mary Hardy, University of Waterloo*

*Arlie Proctor, Casualty Actuarial Society Executive Council*

10:20-10:40 Refreshment Break, Alter Hall, 1st Floor, Ticker Area

10:40-12:20 **Concurrent Sessions 1**

**Concurrent Session 1A**, Alter Hall 237

Rating/Ratemaking

Moderator:

*Margie Rosenberg, University of WI-Madison*

Comparison of the Standard Rating Methods and the New  
General Rating Formula

*Muhamed Borogovac, Boston Mutual Life Insurance Company*

The Use of Annual Mileage as a Rating Variable

*Jean Lemaire, The Wharton School*

*Sojung Park, Seoul National University*

*Kili Wang, Tamkang University*

Ratemaking Using the Tweedie Model

*Peng Shi, University of Wisconsin-Madison*

A Statistical Bonus-Malus System for Panel Data

*Jean-Philippe Boucher, UQAM*

*Rofick Inoussa, UQAM*

A Risk Modeling Framework for Autonomous Vehicle  
Technology

*David Varodayan, University of Illinois at Urbana-Champaign*

*Richard W. Gorvett, University of Illinois at Urbana-Champaign*

*Grace Xingxin Gao, University of Illinois at Urbana-Champaign*

**Concurrent Session 1B**, Alter Hall 606  
Mortality Modeling

Moderator:

*James G. Bridgeman, University of Connecticut*

The Financial Impact of Subjective Mortality Risk

*Thorsten Moenig, University of St. Thomas*

*Clement Foltz, University of St. Thomas*

*Nathan Kent, University of St. Thomas*

*Yabing Yang, University of St. Thomas*

Modeling Mortality by Cause of Death and Socio-Economic Stratification: An Analysis of Mortality Differentials in England

*Andres Villegas, Cass Business School*

*Steven Haberman, Cass Business School*

Forecasting Mortality in Related Populations Using Lee-Carter Type Models: A Comparison

*Ivan Danesi, University of Padova*

*Pietro Millosovich, Cass Business School*

*Steven Haberman, Cass Business School*

Re-fitting Phase-Type Mortality Model

*Matt Bartley, University of Western Ontario*

*Xin Huang, University of Western Ontario*

*Xiaoming Liu, University of Western Ontario*

**Concurrent Session 1C**, Alter Hall 607

Financial Analysis

Moderator:

*Benjamin Avanzi, University of New South Wales*

External Monitor Quality and Managerial Discretion

*Martin F. Grace, Georgia State University*

*Tyler Leverty, University of Iowa*

Executive Compensation and Risk Taking

*Yu-Luen Ma, Illinois State University*

*Ping Wang, St. John's University*

Portfolio Management with the Critical Event Cost Method

*John Major, Guy Carpenter*

*Sherry L. Thomas, Guy Carpenter*

Economic Capital Model Validation  
*Markus Stricker, Georgia State University*  
*David Simmons, Willis Re*  
*Dave Ingram, Willis Re*  
*Alice Underwood, Willis Re*  
*Juan England, Willis Re*

12:20-13:45 Lunch, Alter Hall, 1<sup>st</sup> Floor, Ticker Area

13:50-14:40 **Plenary Session II**, Auditorium, Alter Hall, Lower Level

Lessons from Hurricane Sandy  
*Mark Bove, Munich Re*

14:40-15:40 **Concurrent Sessions 2**

**Concurrent Session 2A**, Alter Hall 237  
Issues in Actuarial Education

Moderator:  
*Ping Wang, St. John's University*

SOA Education Update  
*Stuart Klugman, Society of Actuaries*

Diversity in the Actuarial Profession - Next Steps  
*Barry McKeown, CAS/SOA Committee on Actuarial Diversity;*  
*Towers Watson*

Actuarial Job Market: Overcoming the Matthew Effect  
*Natalia Humphreys, University of Texas at Dallas*

Assessment of a University-Based Actuarial Program: A Case  
Study of UW-Madison  
*Edward (Jed) Frees, University of Wisconsin-Madison*  
*Margie Rosenberg, University of Wisconsin-Madison*

**Concurrent Session 2B**, Alter Hall 606  
Modeling and Pricing

Moderator:  
*Hua Chen, Temple University*

Stochastic Economic Models for Actuarial Use: An Evidence of  
China  
*Fei Huang, Australian National University*

Smoothed Quantiles, Value-at-Risk, and the Method of Percentile-Matching for Claim Count Data  
*Ponmalar Ratnam, University of Wisconsin-Milwaukee*  
*Vytaras Brazauskas, University of Wisconsin-Milwaukee*

Model Uncertainty, Ambiguity Aversion and Implications for Catastrophe Insurance Market  
*Hua Chen, Temple University*  
*Tao Sun, Temple University*

**Concurrent Session 2C**, Alter Hall 607  
Financial Applications

Moderator  
*Richard W. Gorvett, University of Illinois at Urbana-Champaign*

A Mixture Model Approach to Operational Risk Management  
*Andrei Badescu, University of Toronto*  
*Lan Gong, University of Toronto*  
*X. Sheldon Lin, University of Toronto*

Mixed Erlang Moment-Based Approximation: Applications in Actuarial Science and Quantitative Risk Management  
*Hélène Cossette, Université Laval*  
*David Landriault, University of Waterloo*  
*Etienne Marceau, Université Laval*  
*Khouzeima Moutanabbir, University of Waterloo*

Interplay of Insurance and Financial Risks in a Discrete-time Model with Strong Regular Variation  
*Qihe Tang, University of Iowa*

15:40-16:00 Refreshment Break, Alter Hall, 1st Floor, Ticker Area

16:00-17:20 **Concurrent Sessions 3**

**Concurrent Session 3A**, Alter Hall 237  
Valuation

Moderator:  
*Eric Ulm, Georgia State University*

Hyperbolic Discounting: Implications for Actuarial Science and Financial Risk Management  
*Rick Gorvett, University of Illinois at Urbana-Champaign*

Have It Both Ways? A Tale of the Speed-Accuracy Trade-Off in the Valuation of Guaranteed Minimum Withdrawal Benefit  
*Runhuan Feng, University of Illinois at Urbana-Champaign*  
*Hans W. Volkmer, University of Wisconsin-Milwaukee*

Option Pricing Without Tears: Valuing Equity-Linked Death Benefits  
*Elias Shiu, University of Iowa*

Pricing Weather Derivatives Using Maximum Entropy Principle  
*Jeffrey Pai, University of Manitoba*  
*Johnny Li, University of Waterloo*  
*Rui Zhou, University of Manitoba*

**Concurrent Session 3B**, Alter Hall 606  
Insurer Operations

Moderator:  
*Jean Lemaire, The Wharton School*

Pitfalls in Implementation of Non-Discriminatory Premiums: the Case of Unisex Tariffs in the German Auto Insurance Market  
*Vijay Aseervatham, Ludwig-Maximilians-University Munich*  
*Christoph Lex, Ludwig-Maximilians-University Munich*  
*Martin Spindler, Max-Planck-Institute for Social Law and Policy*

Micro-Level Loss Reserving Models for Insurance  
*Xiaoli Jin, University of Wisconsin-Madison*

The Managerial Role of Actuarial Professionals on Insurer's Risk Taking  
*Shinichi Kamiya, Nanyang Technological University*  
*Ang Zie Sen, Nanyang Technological University*  
*Goh Choon Yung, Nanyang Technological University*  
*Lim Wei Thong, Nanyang Technological University*

Property Casualty Insurance and the Next Industrial Revolution: Nanotechnology-Opportunities and Uncertainties  
*Mahmoud Shehadeh, Northern Illinois University*

**Concurrent Session 3C**, Alter Hall 607  
Predictive Modeling & Fuzzy Logic

Moderator:  
*Natalia Humphreys, University of Texas at Dallas*

Predictive Modeling of Storm Damage to Overhead Power Lines  
*Brian Hartman, University of Connecticut*

Predictive Modeling of Healthcare Costs Using Regression Trees  
*Daniel Mena, UC Santa Barbara*  
*Alexandra Moat, UC Santa Barbara*  
*Jessie Wang, UC Santa Barbara*  
*Ian Duncan, UC Santa Barbara*  
*Michael Ludkovski, UC Santa Barbara*

Fuzzy Logic Modifications of the Analytic Hierarchy Process - A Risk Assessment Context  
*Arnold F. Shapiro, Penn State University*  
*Marie-Claire Koissi-Kouassi, Western Illinois University*

Applying Fuzzy Optimization to Risk Assessment  
*Marie-Claire Koissi, Western Illinois University*  
*Arnold F. Shapiro, Penn State University*

- 17:30-17:50 Bus Transportation, Alter Hall to Marriott Hotel  
(You must be on the bus by 17:30.)
- 18:00-22:00 Reception and Dinner, Courtyard Marriott Hotel
- 22:00-22:20 Bus Transportation, Marriott to Temple Dormitory  
(You must be on the bus by 22:00.)

## **August 2, Friday**

- 7:30-7:50** **Bus Transportation: Marriott to Alter Hall**  
(You must be on the bus by 7:30.)
- 8:00-8:30** **Breakfast in Alter Hall, 1<sup>st</sup> Floor, Ticker Area**
- 8:30-9:30** **Concurrent Sessions 4**

**Concurrent Session 4A**, Alter Hall 237  
Copulas

Moderator:  
*Qihe Tang, University of Iowa*

Copula-Dependent Collateral Default Intensity and Its Applications to CDS Rate  
*Jiwook Jang, Macquarie University*  
*Siti Norafidah Mohd Ramli, Macquarie University*

Assessing High-Risk Scenarios by Full-Range Tail Dependence Copula  
*Lei Hua, Northern Illinois University*

A Transformed Linear Approximation to Copula Regression  
*Rahul Parsa, Drake University*  
*Paul Ferrara*

**Concurrent Session 4B**, Alter Hall 606  
Healthcare Modeling

Moderator:  
*Elias Shiu, University of Iowa*

Trend Analysis Algorithms and Applications to Health Rate  
Review

*Ye Ye, Middle Tennessee State University*  
*Le Yin, Middle Tennessee State University*  
*Don Hong, Middle Tennessee State University*  
*Qiang Wu, Middle Tennessee State University*

Predictive Healthcare Cost Modeling Using Regression Splines  
*Andrew Mackenzie, University of California at Santa Barbara*  
*Tiffany Sun, University of California at Santa Barbara*  
*Roger Wu, University of California at Santa Barbara*  
*Ian Duncan, University of California at Santa Barbara*  
*Michael Ludkovski, University of California at Santa Barbara*

Risk Assessment in Group Health Claims  
*Shujuan Huang, University of Connecticut*  
*Brian Hartman, University of Connecticut*

**Concurrent Session 4C**, Alter Hall 607  
Modeling Issues

Moderator:  
*Mathieu Boudreault, University of Quebec Montreal*

Log-Folded-t Models for Insurance Loss Data: Revisited  
*Vytaras Brazauskas, University of Wisconsin-Milwaukee*  
*Andreas Kleefeld, Branderburgische Technische Universitat  
Cottbus*

Bayesian Foundations of Insurance  
*Liang Hong, Robert Morris University*  
*Ryan Martin, University of Illinois Chicago*  
*Zhiqiang Yan, Western Illinois University*

Pairwise Markov Chains Model Applied to Default Data Analysis  
*Selwa Rafi, University of Quebec Montreal*  
*Jean-Philippe Boucher, University of Quebec Montreal*  
*Mathieu Boudreault, University of Quebec Montreal*



9:30-10:20 **Plenary Session III**, Auditorium, Alter Hall, Lower Level

Systemic Risk and the Insurance Industry  
*J. David Cummins and Mary A. Weiss*  
*Temple University*

10:20-10:40 Refreshment Break, Alter Hall, 1<sup>st</sup> Floor, Ticker Area

10:40-12:20 **Concurrent Sessions 5**

**Concurrent Session 5A**, Alter Hall 237  
Longevity Risk

Moderator:

*Steven Haberman, Cass Business School*

Systematic Mortality Risk: An Analysis of Guaranteed Lifetime  
Withdrawal Benefits in Variable Annuities  
*Man Chung Fung, University of New South Wales*  
*Katja Ignatieva, University of New South Wales*  
*Michael Sherris, University of New South Wales*

Personal Care Savings Bonds - A New Way of Saving Towards  
Social Care in Later Life  
*Les Mayhew, Cass Business School*  
*David Smith, Cass Business School*

Intergenerational Equity and Sustainability in A Collective  
Defined Contribution Plan  
*Barbara Sanders, Simon Fraser University*

Credibility for Periodic Payments Such As Pension Plans  
*Charles Fuhrer, The Segal Company*

**Concurrent Session 5B**, Alter Hall 606  
Risk Theory & Insurance Economics

Moderator:

*Liang Hong, Robert Morris University*

On A Ruin Model with Both Interclaim Times and Premiums  
Depending on Claim Sizes  
*Zhong Li, University of Western Ontario*  
*Kristina P. Sendova, University of Western Ontario*

Discounted Moments of Surplus after the Last Innovation before Ruin under the Dual Risk Model

*Chen Yang, University of Western Ontario*

*Kristina P. Sendova, University of Western Ontario*

Ruin Analysis in a Discrete-time Sparre Andersen Model with External Financial Activities and Random Dividends

*Sungsoo Kim, University of Waterloo*

*Steve Drekić, University of Waterloo*

On Two Methods Based on Martingales and Simulation to Compute Infinite-Time Ruin Probabilities

*Hélène Cossette, Université Laval*

*Etienne Larrivé-Hardy, Université Laval*

*Etienne Marceau, Université Laval*

*Julien Trufin, Université Laval*

Risk Reducers in Convex Order

*Junnan He, University of Iowa*

*Qihe Tang, University of Iowa*

*Huan Zhang, University of Iowa*

**Concurrent Session 5C**, Alter Hall 607

Financial Analysis

Moderator:

*Vytaras Brazauskas, University of Wisconsin-Milwaukee*

Calibration of a Regime-Switching Interest Rate Model

*James G. Bridgeman, University of Connecticut*

*Zepeng Xie, University of Connecticut*

*Xuezhi Zhang, University of Connecticut*

On Optimal Periodic Dividend Strategies in the Dual Model with Diffusion

*Benjamin Avanzi, University of New South Wales*

*Vincent Tu, University of New South Wales*

*Bernard Wong, University of New South Wales*

An Actuarial Model of Excess of Policy Limits Losses

*Neil Bodoff, Willis Re*

Application of Actuarial Science to Systemic Risk in the Housing Sector

*Shaun Wang, Geneva Association*

12:20-13:50

Lunch, Alter Hall, 1<sup>st</sup> Floor, Ticker Area

14:00-14:50 **Plenary Session IV**, Auditorium, Alter Hall, Lower Level  
Predictive Modeling

Moderator:

*Alice Underwood, Willis Re*

Panelists:

*Louise Francis, Francis Analytics*

*Kevin Pledge, Insight Decision Research*

*Dan Tevet, Insurance Services Office*

14:50-15:40 **Plenary Session V**, Auditorium, Alter Hall, Lower Level

State of the Insurance Industry

*John Andre, A.M. Best Company*

15:40-16:00 Refreshment Break, Alter Hall, 1<sup>st</sup> Floor, Ticker Area

16:00-17:20 **Concurrent Sessions 6**

**Concurrent Session 6A**, Alter Hall 237

An Open Forum on Actuarial Education

Moderator:

*Ron Gebhardtshauer, Penn State University*

Participants:

*Mark Maxwell, University of Texas at Austin*

*Brian Hartman, University of Connecticut*

The objective of the session is to facilitate an open audience discussion where educators share their ideas about teaching and student development. Examples include innovative ideas in class projects, motivating students, grading schemes, technical writing projects, etc. We seek new techniques to motivate students, develop effective thinking skills, and improve student creativity, curiosity, and communication skills. We hope everyone leaves the discussion excited to try something new. Suggested reading: "Student Projects," *Expanding Horizons* (Society of Actuaries, April 2013).

**Concurrent Session 6B**, Alter Hall 606

Pricing & Capital Allocation

Moderator:

*Rui Zhou, University of Manitoba*

Investors' Perspective Risk Analysis of Catastrophe Bonds  
*Thomas Nowak, University of the Federal Armed Forces in Munich*

Participating Life Insurance Contracts under Risk Based Solvency Frameworks: Increasing Capital Efficiency by Product Design

*Andreas Reuss, Institut für Finanz-und Aktuarwissenschaften*  
*Jochen Russ, Institut für Finanz-und Aktuarwissenschaften and Ulm University*  
*Jochen Wieland, Ulm University*

Pricing Risk through Simulation: Revisiting Tilley Bundling and Least Squares Monte Carlo Methods

*Rickard Brannvall, Citigroup London*  
*Dominic Cortis, University of Leicester*  
*Juxi Li, University of Leicester*

On Bivariate Distributions Defined with Exponential Marginals: Aggregation and Capital Allocation

*Hélène Cossette, Université Laval*  
*Etienne Marceau, Université Laval*  
*Samuel Perreault, Université Laval*

Improving Pension Product Design

*Agnieszka Konicz, Technical University of Denmark*  
*John M. Mulvey, Princeton University*

**Concurrent Session 6C**, Alter Hall 607  
Catastrophes and Reinsurance

Moderator:

*Mary A. Weiss, Temple University*

Catastrophe Reinsurance and Bonds:  
Valuation and Optimum Mix

*Carolyn Chang, California State University Fullerton*  
*Jack S.K. Chang, California State University Los Angeles*  
*Min-The Yu, National Chiao Tung University*

Capital Tranching: A RAROC Approach to Assessing Reinsurance Cost Effectiveness

*Donald Mango, Guy Carpenter*  
*John Major, Guy Carpenter*

Hidden Risks of a Credit Portfolio with Stochastic Recovery  
*Zhongyi Yuan, Pennsylvania State University*

Estimation of Models for Time Series of Counts With Stochastic Autoregressive Mean: An Application To Tropical Cyclones  
*Mathieu Boudreault, Universite du Quebec a Montreal*  
*Jean-Philippe Boucher, Universite du Quebec a Montreal*  
*Louis-Philippe Caron, Stockholm University*

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### **August 3, Saturday**

- 7:30-7:50 Bus Transportation: Marriott to Alter Hall**  
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- 8:00-8:30 Breakfast in Alter Hall, 1<sup>st</sup> Floor, Ticker Area**
- 8:30-10:10 Concurrent Sessions 7**

**Concurrent Session 7A, Alter Hall 237**  
Mortality Modeling

Moderator:  
*Michael Ludkovski, UC Santa Barbara*

Canadian Pensioners Mortality Improvement Rates by Data Source and Income: Life Expectancy and Present Value of Annuity  
*Louis Adam, Université Laval*

Multi-State Actuarial Models of Functional Disability  
*Joelle H. Fong, University of New South Wales*  
*Adam W. Shao, University of New South Wales*  
*Michael Sherris, University of New South Wales*

Comparison of Stochastic Mortality Models: Application to Turkish Mortality Data  
*Funda Kul, Hacettepe University*  
*Meral Sucu, Hacettepe University*

Successive Logistic Trend: An Alternative Model for Mortality Improvement in the US Population  
*Andrew L. Dicus, Ge Han, and Ohoe Kim*  
*Towson University*

On Basis Risk in Extreme Mortality CAT Bonds  
*Rosena Chan, University of Manitoba*  
*Xuemiao Hao, University of Manitoba*

**Concurrent Session 7B**, Alter Hall 606  
Estimation Techniques

Moderator:  
*Ron Gebhardtsbauer, Penn State University*

DFA with Dependency between Motor Own Damage Insurance  
and Compulsory Motor Insurance - The Case of Turkey  
*Betül Karagül, Hacettepe University*  
*Murat Büyükyazıcı, Hacettepe University*

Computing Semiparametric Bounds on the Expected Payments  
of Insurance Instruments via Column Generation  
*Robert Howley, Lehigh University*  
*Robert Storer, Lehigh University*  
*Luis Zuluaga, Lehigh University*  
*Juan Vera, Tillburg University*

Generalized Linear Models for a Dependent Aggregate Claims  
Model  
*Juliana Schulz, Concordia University*

Modeling Dependence between Loss Triangles Using  
Hierarchical Archimedean Copulas  
*Anas Abdallah, Université Laval*  
*Jean-Philippe Boucher, UQAM*  
*Hélène Cossette, Université Laval*

The Distribution of Aggregate Life Insurance Claims: The  
Gamma-Exponential Mix Model  
*Tom Edwalds, Munich Re*  
*Ross Hilton*

**Concurrent Session 7C**, Alter Hall 607  
Risk Theory & Risk Measures

Moderator:  
*Runhuan Feng, University of Illinois at Urbana-Champaign*

Asymptotic Expressions for the Haezendonck--Goovaerts Risk  
Measure with General Young Function  
*Fan Yang, Drake University*  
*Qihe Tang, University of Iowa*

Scoring Rules for Subjective Probability Distributions  
*Glenn W. Harrison, Georgia State University*  
*Jimmy Martínez-Correa, Copenhagen Business School*  
*J. Todd Swarthout, Georgia State University*  
*Eric Ulm, Georgia State University*

On a Risk Measure Inspired from the Ruin Probability  
*Ilie Mitric, Université Laval*  
*Julien Trufin, Université Laval*

Asymptotic Confidence Intervals for the Haezendonck Risk Measure  
*Nariankadu Shyamalkumar, University of Iowa*

Ruin Probabilities in Multivariate Risk Models with Periodic Common Shock  
*Ionica Groparu-Cojocaru, Concordia University*  
*Jose Garrido, Concordia University*

10:10-10:30 Refreshment Break, Alter Hall, 1<sup>st</sup> Floor, Ticker Area  
Taxi Signup

10:30-11:50 **Concurrent Sessions 8**

**Concurrent Session 8A**, Alter Hall 237  
Issues in Health Actuarial Science

Moderator:  
*Robert Lieberthal, Thomas Jefferson University*

Evaluating Approaches for Health Economics and Outcomes Research  
*Robert Lieberthal, Thomas Jefferson University*  
*Jessica Lopatto, Thomas Jefferson University*  
*Kate Cecil, Thomas Jefferson University*  
*Joseph Jackson, Thomas Jefferson University*

TIPS, the Triple Duration, and the OPEB Liability: Hedging Medical Care Inflation in OPEB Plans  
*Michael Ashton, Enduring Investments LLC*

Risk Adjustment and the Patient Protection and Affordable Care Act  
*Marjorie Rosenberg, University of Wisconsin-Madison*  
*Michael Wurm, University of Wisconsin-Madison*

Health Care Costs--From Birth to Death  
*Dale Yamamoto, Red Quill Consulting*

**Concurrent Session 8B**, Alter Hall 606  
Annuities

Moderator:

*Louis Adam, Université Laval*

A Regime-Switching Framework for the Valuation of a  
Guaranteed Annuity Option

*Huan Gao, University of Western Ontario*

*Rogemar Mamon, University of Western Ontario*

*Anton Tenyakov, University of Western Ontario*

*Xiaoming Liu, University of Western Ontario*

Pricing Guaranteed Minimum Death Benefits under Stochastic  
Volatility and Stochastic Interest Rate

*Xiao Wei, Central University of Finance and Economics*

*Sha Li, Central University of Finance and Economics*

Portfolio Choice with Life Annuities under Probability Distortion

*Wenyuan Zheng, University of Connecticut*

*James G. Bridgeman, University of Connecticut*

A Generalized Modeling Framework for Guaranteed Annuity  
Options

*Milos Miljanovic, University of Western Ontario*

*Huan Gao, University of Western Ontario*

*Xiaoming Liu, University of Western Ontario*

*Rogemar Mamon, University of Western Ontario*

**Concurrent Session 8C**, Alter Hall 607

Modeling Issues

Moderator:

*Krupa Viswanathan, Temple University*

On Negative Option Values in Personal Savings Products

*Thorsten Moenig, University of St. Thomas*

*Daniel Bauer, Georgia State University*

Livestock Mortality Insurance Framework Using Beta Mixture  
Model: Frequency of Losses of Crop Insurance in Canada

*Jon Lim, University of Waterloo*

*Lysa Porth, University of Manitoba*

*Milton Boyd, University of Manitoba*

*Brock Porth, University of Manitoba*



Valuation of Some Contracts to Hedge Relative Maximum  
Drawdown  
*Bin Li, University of Waterloo*

- 11:50-11:55 Closing Session
- 12:00 Box Lunch, Alter Hall, 1<sup>st</sup> Floor, Ticker Area