The 48th Actuarial Research Conference 2013

PROGRAM and ABSTRACTS

Fox School of Business
TEMPLE UNIVERSITY®

July 31 – August 3, 2013
Philadelphia, PA

The 48th Actuarial Research Conference 2013 Temple University

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July 31 – August 3, 2013
Philadelphia, PA

Organized by

Department of Risk, Insurance and Healthcare Management
Fox School of Business

The 48th Actuarial Research Conference

2013

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The 48th Actuarial Research Conference
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The 48th Actuarial Research Conference

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48th Actuarial Research Conference

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

PROGRAM OVERVIEW

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 toTemple Dormitory** (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, 1st Floor, Ticker Area**
8:25-9:30	**Opening Session**, Auditorium, Alter Hall, Lower Level
9:30-10:20	**Plenary Session I**, Auditorium, Alter Hall, Lower Level Actuarial Education
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
	Concurrent Session 1B, Alter Hall 606 Mortality Modeling
	Concurrent Session 1C, Alter Hall 607 Financial Analysis
12:20-13:45	Lunch, Alter Hall, 1st 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
	Concurrent Session 2B, Alter Hall 606 Modeling and Pricing
	Concurrent Session 2C, Alter Hall 607 Financial Applications
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
	Concurrent Session 3B, Alter Hall 606 Insurer Operations
	Concurrent Session 3C, Alter Hall 607 Predictive Modeling & Fuzzy Logic
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, 1st Floor, Ticker Area**
8:30-9:30	**Concurrent Sessions 4**
	Concurrent Session 4A, Alter Hall 237 Copulas
	Concurrent Session 4B, Alter Hall 606 Healthcare Modeling

	Concurrent Session 4C, Alter Hall 607 Modeling Issues
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, 1st Floor, Ticker Area
10:40-12:20	**Concurrent Sessions 5**
	Concurrent Session 5A, Alter Hall 237 Longevity Risk
	Concurrent Session 5B, Alter Hall 606 Risk Theory & Insurance Economics
	Concurrent Session 5C, Alter Hall 607 Financial Analysis
12:20-13:50	Lunch, Alter Hall, 1st Floor, Ticker Area
14:00-14:50	**Plenary Session IV**, Auditorium, Alter Hall, Lower Level
	Predictive Modeling
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, 1st Floor, Ticker Area
16:00-17:20	**Concurrent Sessions 6**
	Concurrent Session 6A, Alter Hall 237
	An Open Forum on Actuarial Education
	Concurrent Session 6B, Alter Hall 606 Pricing & Capital Allocation
	Concurrent Session 6C, Alter Hall 607 Catastrophes and Reinsurance
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 3, Saturday

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, 1st Floor, Ticker Area**
8:30-10:10	**Concurrent Sessions 7**
	Concurrent Session 7A, Alter Hall 237 Mortality Modeling
	Concurrent Session 7B, Alter Hall 606 Estimation Techniques
	Concurrent Session 7C, Alter Hall 607 Risk Theory & Risk Measures
10:10-10:30	Refreshment Break, Alter Hall, 1st Floor, Ticker Area Taxi Signup
10:30-11:50	**Concurrent Sessions 8**
	Concurrent Session 8A, Alter Hall 237 Issues in Health Actuarial Science
	Concurrent Session 8B, Alter Hall 606 Annuities
	Concurrent Session 8C, Alter Hall 607 Modeling Issues
11:50-11:55	Closing Session
12:00	Box Lunch, Alter Hall, 1st Floor, Ticker Area

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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, 1st 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 Millossovich, 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, 1st 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

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August 2, Friday

7:30-7:50 **Bus Transportation: Marriott to Alter Hall**
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8:00-8:30 **Breakfast in Alter Hall, 1st 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, 1st 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 Drekic, University of Waterloo

On Two Methods Based on Martingales and Simulation to Compute Infinite-Time Ruin Probabilities
Hélène Cossette, Université Laval
Etienne Larrivée-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, 1st 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, 1st Floor, Ticker Area
16:00-17:20	**Concurrent Sessions 6** **Concurrent Session 6A**, Alter Hall 237 An Open Forum on Actuarial Education Moderator: *Ron Gebhardtsbauer, 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

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

17:30-17:50 Bus Transportation, Alter Hall to Marriott Hotel
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8:00-8:30 **Breakfast in Alter Hall, 1st 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

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

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, 1st 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

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

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

11:50-11:55 Closing Session

12:00 Box Lunch, Alter Hall, 1st Floor, Ticker Area