Symposium on the Measurement of Low Probability Events in the context of Financial Risk Management

April 16th – 17th, 2009
The Wharton School, Philadelphia, PA

Organized by: S. S. Huebner Foundation
Sponsored by: CRA International
Insurance Studies Institute

Purpose:

The accuracy in the measurement of low probability event is increasingly becoming important for the purpose of portfolio management, calculating economic capital for the regulatory purpose, and for pricing insurance products among others. However, the research in this area is at a very early stage and need directions in the context of new application areas. The purpose of the symposium is to bring together academics, policy makers, and the practitioners to discuss the fundamental issues in the measurement of rare events. The symposium will devote in discussing the state of the art and their short comings in the understanding of the problem. Various application areas such as: market risk, credit risk, operational risk, and catastrophic risk in insurance will be of interest.

Topics:

Speaker: Gary Venter, Columbia University

Short Bio: Gary Venter, FCAS, CERA, ASA, MAAA is a consulting actuary and teaches graduate courses in actuarial science at Columbia University.

Presentation title: Low Frequency Shocks in the Nonlife Insurance Sector

Abstract: Modeling, hedging, and pricing of risks of natural catastrophes. Mr. Venter presented on issues such as liabilities estimation, causes and management of risk cycles.

Speaker: Kabir Dutta, CRA International

Short Bio: Kabir Dutta is a principal in the Finance practice of CRA International. Dr. Dutta has more than 15 years of experience in financial risk management of market (equity, commodity, and foreign exchange), interest rate, and operational risk.

Presentation title: Low Frequency Shocks in the Nonlife Insurance Sector

Abstract: Operational risk modeling is a new challenge for which a scientific research is needed. A poor operational risk modeling can have severe impact. Model should not be judged by capital but by its statistical validity, sensitivity, and stability with respect to different data. Any research that is not supported by sensitivity analysis and stress tested with respect to variety of data should not be taken seriously. Scenario data is more well-suited for institutions' risk analyses than direct use of the external data.

Speaker: David Babbel, Vice President CRA International and Professor, Wharton School

Short Bio: Prior to joining CRA as a senior advisor and director of the insurance economics practice, Dr. Babbel was a senior financial economist in the Financial Sector Development Department of the World Bank, and a vice president in the Pension and Insurance Department and senior advisor to Goldman Sachs. In addition, Dr. Babbel is Professor of Insurance and Risk Management, and also Professor of Finance at the Wharton School of the University of Pennsylvania, having previously served on the faculty at the Haas School in the University of California at Berkeley.

Presentation title: Measurement of Low Probability Risks

Abstract: Jarque-Bera (JB) Test on Monthly S&P 500 Returns, Distribution of Historical and Simulated Monthly S&P 500 Returns, 14-yr Annuity: Historical and Simulated Crediting Rates, 9-yr Annuity v. Alternative Investments, Canadian Insurance Merger

Speaker: Dave Sandberg, VP & Corporate Actuary, Allianz Life of North America

Short Bio: Prior to his current position at Allianz Life, Mr. Sandberg was the appointed actuary for LifeUSA Insurance Company, a major writer of deferred and equity indexed annuities. Mr. Sandberg graduated from Brigham Young University with a degree in Economics.

Presentation title: Clarifying the Shortcoming of the Measurement of Low Probability Events with Appropriate Focus

Abstract: What is the Shortcoming & Its Causes, Review Risk Architecture on Which to Base Sound Solutions, What Enterprise Risk Management (ERM) Processes Can Be Used to Address the Shortcoming(s), Outstanding Issues

Speaker: Helen MacGillivray, Professor, Queensland University of Technology, Australia

Short Bio: Helen MacGillivray is currently a Professor in the School of Mathematical Sciences at QUT, having previously worked at the University of Queensland and the Australian National University. Helen is President-elect of the International Association for Statistical Education, chair of Statistics Education for the 2009 Session of the International Statistical Institute, and scientific coordinator of the 8th International Conference on Teaching Statistics, 2010. Helen was the first female President, and is the only female Honorary Life Member, of the Statistical Society of Australia. She has also been President of the Australian Mathematical Sciences Council, Board member of the Federation of Australian Scientific and Technological Sciences and a member of the Institutional Grants Committee of the Australian Research Council.

Presentation title: Tukey-type distributions in measuring skewness Queensland University of Technology and kurtosis

Abstract: What are skewness & kurtosis – concepts & Coherence, Transformations & applying above to multiplier Concept, g-and-k & adapted g-and-h: examples & approxs, Fitting & simulations & examples: -Quick median, -NMLE, -Iteratively weighted linear combinations, -Bayesian, Diagnostic plots: -Skew t, -Application to datasets, including g-and-h

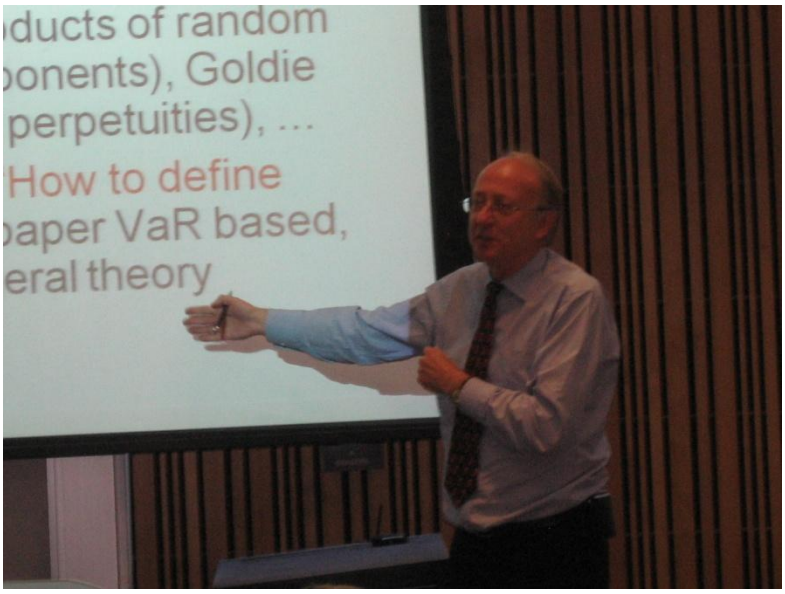
Speaker: David C. Hoaglin, Principal Statistician, Abt Bio-Pharma Solutions, Inc.

Short Bio: David C. Hoaglin, Ph.D., is Principal Statistician at Abt Bio-Pharma Solutions, Inc., a global provider of integrated clinical, health economic, and commercialization solutions for the pharmaceutical, biotech, and medical device and diagnostics industries. Earlier he held faculty and research positions in statistics at Harvard University and was also associated for 30 years with Abt Associates Inc. He is a recognized authority on exploratory data analysis and has co-authored or co-edited four books on the subject. In addition, he has made major contributions to the study of procedures for detecting outliers; he is co-author of a book on this topic. Dr. Hoaglin has applied statistical methods in the design and analysis of studies and experiments in a variety of fields, including housing, income security, education, health services, public health, and medicine. He received his Ph.D. in statistics from Princeton University in 1971.

Presentation title: Discussion (Distribution Shape and g-and-h)

Abstract: Vague concepts, Distribution shape, Summarizing a distribution, Exploratory Data Analysis, g-and-h distributions, How much data do we need?

Speaker: Paul Embrechts, Professor of Mathematics and Director of RiskLab, ETH Zurich



Short Bio: Paul Embrechts is Professor of Mathematics at the ETH Zurich specialising in actuarial mathematics and quantitative risk management. Previous academic positions include the Universities of Leuven, Limburg and London (Imperial College). Dr. Embrechts has held visiting professorships at the University of Strasbourg, ESSEC Paris, the Scuola Normale in Pisa (Cattedra Galileiana), the London School of Economics (Centennial Professor of Finance), the University of Vienna, Paris 1 (Panthéon-Sorbonne), and has an Honorary Doctorate from the University of Waterloo. He is an Elected Fellow of the Institute of Mathematical Statistics, Actuary-SAA, Honorary Fellow of the Institute and the Faculty of Actuaries, Corresponding Member of the Italian Institute of Actuaries and is on the editorial board of numerous scientific journals. He belongs to various national and international research and academic advisory committees. He co-authored the influential books "Modelling of Extremal Events for Insurance and Finance", Springer, 1997 and "Quantitative Risk Management: Concepts, Techniques and Tools", Princeton UP, 2005. Dr. Embrechts consults on issues in quantitative risk management for financial institutions, insurance companies and international regulatory authorities. For full details of his CV, see http://www.math.ethz.ch/~embrechts/CV-PE.html

Presentation title: QRM, Extremes, Mathematics and the Financial Crisis

Abstract: There exists a statistical theory for the analysis of rare events, It does not offer a panacea, It does offer the right pair of glasses to look at such events, hence important, Besides statistical techniques: judgment!, “Managing such risks” is becoming crucial, EVT should be standard RM teaching at all levels, The theory offers guidance on what is not possible to measure or price

Speaker: Francis X. Diebold, Professor, Wharton School and Department of Economics, University of Pennsylvania

Short Bio: Francis X. Diebold is J.M. Cohen Professor of Economics, Professor of Finance and Statistics, and Co-Director of the Financial Institutions Center at the University of Pennsylvania and its Wharton School, and Faculty Research Associate at the National Bureau of Economic Research in Cambridge, Mass. Diebold works in econometrics, forecasting, finance and macroeconomics. He has published extensively and has served on the editorial boards of numerous journals, including Econometrica and Review of Economics and Statistics. He is an elected Fellow of the Econometric Society and the American Statistical Association, and the recipient of Sloan, Guggenheim, and Humboldt fellowships. A prize-winning teacher and popular lecturer, Diebold has also held visiting appointments in Economics and Finance at Princeton University, the University of Chicago, Cambridge University, Johns Hopkins University, and New York University. From 1986-1989 he served as an economist under Paul Volcker and

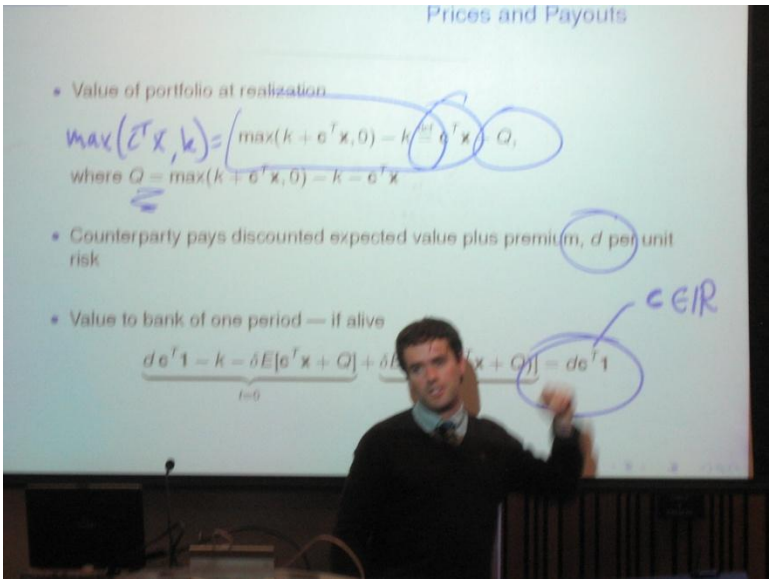
Alan Greenspan at the Board of Governors of the Federal Reserve System in Washington DC. He received his B.S. from the Wharton School in 1981 and his Ph.D. in 1986, also from the University of Pennsylvania. He is married with three children and lives in suburban Philadelphia.

Presentation title: Learning from the Financial Crisis (To Avoid the Next, or at Least Lessen its Impact)

Abstract: Investors seek high absolute returns. Regulators create a strong safety net for distressed financial institutions. Regulatory Implications: More emphasis on incentives, less on rules, Promote privatization of losses, Consider bankruptcy

Speaker: Johan Walden, Professor, University of California Berkeley

Short Bio: Johan Walden is an Assistant Professor at the Haas School of Business, UC Berkeley. He received his Ph.D. in financial economics from the Yale School of Management. Professor Walden's research is focused on theoretical asset pricing, and on financial and insurance markets when risks are heavy-tailed. Previously, Professor Walden worked as a management consultant at McKinsey & Company, and as a Postdoctoral research associate at Yale Department of Mathematics. He also has a Ph.D. and Docentship in applied mathematics from Uppsala University, Sweden.



Presentation title: Diversification Disasters

Abstract: The recent financial crisis has revealed highly significant externalities through which the actions of individual banks may create enormous systemic risks. It is therefore extremely important to understand the differences between risks faced by individual banks versus the societal level. We develop a model in which the negative externality arises because actions to diversify that are optimal for individual banks may prove to be suboptimal for society. We show that the distributional properties of the risks are crucial: most importantly, with moderately heavy-tailed risks, the diversification actions of individual banks may be suboptimal for society. Moreover, when there is uncertainty about correlations between a large number of thin-tailed risks and banks face value at risk constraints, they invest in such moderately heavy-tailed portfolios. The optimal outcome from society's perspective involves less risk sharing, but also creates a lower probability for massive bank collapses. We derive the exact conditions under which the risk-sharing outcome is socially suboptimal. Our analysis has implications for policy decision makers and for bank risk management.

Speaker: Christian Genest, Professor, University of Laval

Short Bio: Christian Genest studied mathematics in Chicoutimi, Montreal and Vancouver, Canada. Since 1984, he held teaching positions at the University of Waterloo (Ontario) and at Universite Laval (Quebec). He is the author of some 90 peer-reviewed research articles in multivariate analysis, nonparametric statistics, actuarial science, finance and hydrology. He is a former President of the Statistical Society of Canada and has served on the Editorial Board of various journals, most notably "The Canadian Journal of Statistics." He is a fellow of the American Statistical Association and the Institute of Mathematical Statistics.

Presentation title: Copula modeling in finance

Abstract: Copulas, Copula models in finance, Inference for copula models, Detecting and estimating extreme behavior