

## D03: Working Parties in the CAS

### 33<sup>rd</sup> ANNUAL GIRO CONVENTION

Hilton Vienna Hotel, Am Stadtpark

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## Session Outline

- Working Parties in the CAS?
- Completed CAS Working Parties
- CAS Working Parties in Progress
- Areas for Future Joint Research?

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## Working Parties in the CAS?

- Plagiarism or Envy?
- CAS Started Working Party Concept in 2003
- How CAS Working Parties Differ from GIRO
- [www.casact.org/research/index.cfm?fa=workingparty](http://www.casact.org/research/index.cfm?fa=workingparty)  
for work products

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## Completed CAS Working Parties

- Correlations and Dependencies Among All Risk Sources
- Executive Level Decision Making Using Dynamic Risk Modeling
- Elicitation and Elucidation of Risk Preferences
- Quantifying Variability in Reserve Estimates
- Data Quality (With GIRO)
- Risk Transfer Testing



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## Correlations and Dependencies Among All Risk Sources Working Party

- Sponsored by Enterprise Risk Management Committee
- Completed: four-part report
- Goal: begin laying the theoretical and experimental foundation for quantifying variability when data is limited, estimating the nature and magnitude of dependence relationships, and generating aggregate distributions that integrate these disparate risk sources.
- [www.casact.org/members/committees/index.cfm?fa=corr\\_wp](http://www.casact.org/members/committees/index.cfm?fa=corr_wp)



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## Correlations and Dependencies Among All Risk Sources Working Party

- Part 1—Correlation and Aggregate Loss Distributions With an Emphasis on the Iman-Conover Method
  - By Stephen J. Mildenhall
- Part 2—Aggregating Bivariate Claim Severities With Numerical Fourier Inversion
  - By David L. Homer, FCAS
- Part 3—The Common Shock Model for Correlated Insurance Losses
  - By Glenn Meyers, FCAS, MAAA, Ph.D
- Part 4—Serial Correlations of Interest and Inflation Rates
  - By Hans E. Waszink AAG, MSc.



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### Executive Level Decision Making Using Dynamic Risk Modeling Working Party

- Sponsored by Dynamic Risk Modeling Committee
- Completed: July, 2004
- Goal: Assist actuaries who communicate the results of a DRM analysis to senior management by providing examples of effective presentations



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### Executive Level Decision Making Using Dynamic Risk Modeling Working Party

- Identified most effective uses of DRM in the property/casualty insurance industry
- For each use, developed a template for presenting the conclusions
- Including a written description of how the analysis was summarized



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### Executive Level Decision Making Using Dynamic Risk Modeling Working Party

- Work Products:
  - Written Report
  - PowerPoint Template
  - Paper describing template and presentation issues
  - Three sample presentations
  - Collection of guidelines
- Updates / enhancements can be submitted to the Dynamic Risk Modeling Committee



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### Elicitation and Elucidation of Risk Preferences Working Party

- Sponsored by CAS
- Completed: 2005
- Goal: Implicit in ERM policy is some statement of acceptable and unacceptable tradeoffs, or risk preferences. Since risk preferences will be a central part of the ERM policy, they should be explicitly determined. This would be accomplished through a process of eliciting and elucidating the risk preferences that management may already have in mind for operating the company.
- [www.casact.org/pubs/forum/05fforum/05f01.pdf](http://www.casact.org/pubs/forum/05fforum/05f01.pdf)



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### Elicitation and Elucidation of Risk Preferences Working Party

- Defining risk unambiguously.
- Necessity to define the risk measures to be evaluated.
- Several approaches to ascertain risk preferences.
- Discussion and research in behavioral finance and the natural human biases present when assessing risk.
- Conclusion of the risk preference discussion
- Bibliography for additional reference.



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### Quantifying Variability in Reserve Estimates Working Party

- Sponsored by CAS
- Completed: 2005
- Goal: Over the years many people (actuaries and others) have made significant contributions to the literature and overall discussion of how to estimate the potential variability of ultimate losses, but there is no clear preferred method within the actuarial community.
- This research paper is an attempt to bring all of the historical research together in one cohesive document.
- [www.casact.org/pubs/forum/05fforum/05f29.pdf](http://www.casact.org/pubs/forum/05fforum/05f29.pdf)



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## Quantifying Variability in Reserve Estimates Working Party

- Section 2 discusses the scope of what we are attempting as well as provides a uniform glossary that we will use to communicate our results.
- Section 3 discusses criteria for reviewing models.
- Section 4 gives a broad taxonomy of models currently in use.
- Section 5 discusses results of various models.
- Section 6 points out some areas of future research.
- Section 7 finishes with a list of caveats and limitations to this work.

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## Data Quality Working Party

- Sponsored by GIRO
- Joint GIRO/CAS Working Party
- Completed: 2006
- Goal: Increase visibility of data quality as a critical issue for the actuarial profession. Conduct original research and literature review to provide management with motivation and tools for remediating data quality problems
- The research paper is available on the GIRO web site
  - Paper will be presented in workshop at this conference

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## Data Quality Working Party Report

- Literature Review
- Data Quality Horror Stories
- Data Quality Survey
- Data Quality Experiment
- Conclusions and Actions

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## Risk Transfer Testing Working Party

- Sponsored by Committee on Reinsurance
- Completed: July 2005
- Goal: The American Academy of Actuaries Committee on Property and Liability Financial Reporting (COPLFR) Risk Transfer Subgroup sought suggestions from property-casualty actuaries on how to define and test for "risk transfer" in reinsurance transactions.
- This was in response to a request from the Casualty Actuarial Task Force (CATF) of the National Association of Insurance Commissioners (NAIC).
- In order to ensure a response to the AAA's request for suggestions, the CAS formed a Research Working Party on Risk Transfer Testing to identify and recommend at least one risk transfer testing method to the AAA by the July 15, 2005 deadline.
- [www.casact.org/research/risk-transfer-wp-report.pdf](http://www.casact.org/research/risk-transfer-wp-report.pdf)



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## Risk Transfer Testing Working Party

- U.S. accounting standards (such as FAS 113 and SSAP 62) require that a reinsurance contract must satisfy one of two conditions in order to qualify for reinsurance accounting treatment:
  1. The contract must transfer "substantially all" of the underlying insurance risk, or failing that,
  2. It must at least transfer "significant" insurance risk.
- The paper presents methods to test for both conditions, but the main focus is on testing for "significant" risk transfer.
- The shortcomings of the commonly used "10-10" test are discussed and two alternative testing frameworks are presented as significant improvements over "10-10".
- The first of these, which is presented in detail, is based on the expected reinsurer deficit (ERD). Conceptually, that approach is a refinement and generalization of "10-10" that addresses its major shortcomings.
- The second framework, based on the right tail deviation (RTD), is presented more briefly. It has certain desirable properties but at the cost of greater complexity



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## CAS Working Parties in Progress

- Data Management and Information Educational Materials
- Loss Simulation Model
- Bornhuetter-Ferguson-Initial Expected Losses
- Dynamic Risk Modeling Handbook
- Public-Access DFA Model
- Tail Factors



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### Data Management and Information Educational Materials Working Party

- Sponsored by Committee on Data Management and Information
- Completion: Early 2007
- Goal: Identify key educational resources on data issues for actuaries by reviewing the literature on the topic and publishing findings



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### Data Management and Information Educational Materials Working Party

- Work Products:
  - Book Reviews for *Actuarial Review*
  - Data Quality White Paper (possible new Exam material)
  - Concatenation of Book Review for Forum
  - Presentations on Data Quality
  - Identify Areas for Future Research



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### Data Management and Information Educational Materials Working Party

- Book reviews completed in 2006
  - Every relevant book on the subject has been reviewed
- Next step – white paper
  - Summarize the most important information from the books into one document
  - Possibly replace current syllabus material with white paper
- Seminars and conferences
  - Working party will present its findings in March at Ratemaking seminar
  - Results of GIRO Data Quality Working Party will also be presented



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## Loss Simulation Model Working Party

- Sponsored by the Dynamic Risk Modeling Committee
- Completion: Early 2007
- Goal: Creation of a simulation model that will generate claims that can be summarized into loss development triangles and complete rectangles



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## Loss Simulation Model Working Party

- Work Products:
  - Paper documenting work
  - Open source programs
  - CAS seminar
- Triangles by layer, by different type of claim information (e.g., paid, incurred, Sal. & Sub., claim counts, etc.), by hazard, by line of business, etc.



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## Loss Simulation Model Working Party

- A primary purpose will be to test various loss development methods and models
- Not focusing on actual testing, but on creating the simulated data sets for future research
- A criterion for judging the quality of this model will be to evaluate the simulated data to make sure that it is realistic - i.e., it cannot be distinguished statistically from real data sets



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### Loss Simulation Model Working Party

- Develop criteria for using simulated data for evaluating different reserving methods
- Program model in languages widely familiar & relatively inexpensive
- Establish procedure to review and test modifications to the LSMWP version of the model proposed by its users



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### Loss Simulation Model Working Party

- Group A: Literature & Test Criteria
- Group B: Data, Parameters & Testing
- Group C: Model Development
- Modeling individual losses and transactions rather than aggregate triangles and statistics
- Use intervals of one day in measuring time for simulated lags and waiting periods



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### Loss Simulation Model Working Party

- Simulating each event normally captured by claim systems (accident date, report date, initial reserve, subsequent valuation dates and reserves, payment date, payment amount, recovery date, and recovery amount)
- Output may be in full detail of the simulation itself, or it may be at some higher level of aggregation, such as loss triangles



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## Loss Simulation Model Working Party

### Some Key Model Features:

- Observation period
- Time intervals
- Exposures
- Events
- Distributions
- Frequency
- Report lag
- Payment lag
- Inter-valuation waiting times
- Adjustment lag
- Size of loss
- Case reserve factor
- Fast-track reserve
- Second-level distributions
- Monthly vectors of parameters
- Trend and seasonality
- Lines and Loss Types
- Correlations
- Clustering
- Output

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## Bornhuetter-Ferguson-Initial Expected Losses Working Party

- Sponsored by Committee on Reserves
- Completion: Late 2006
- Goal: To publish a paper to provide guidance for practitioners and education for students
- Initial expected losses can be applicable to methods beyond BF

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## Bornhuetter-Ferguson-Initial Expected Losses Working Party

- BF can be thought of as a credibility weighted estimate of chain-ladder indication and initial expected losses
- Much written about chain-ladder method, relatively little about initial expected losses
- BF paper simply says that if the “expected loss ratio cannot be selected with much accuracy, a high ratio should be used.”

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### Bornhuetter-Ferguson-Initial Expected Losses Working Party

- Working Party Tasks:
  - Survey workplaces
  - Identify and summarize relevant published literature
  - Groundwork for evaluating various options for IEL development
  - Not engaged in primary research



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### Bornhuetter-Ferguson-Initial Expected Losses Working Party

- Survey identified methods grouped into:
  - IEL obtained from information in the triangle
  - IEL obtained from outside source
  - Other



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### Bornhuetter-Ferguson-Initial Expected Losses Working Party

- IEL Obtained from Triangle:
  - Price (or exposure) / Trend Roll Forward
  - Stanard-Buhlmann / Cape Cod
  - Average of LDF methods
  - Historical average of ultimates/loss costs
  - Frequency/Severity
  - Least Squares Regression/Simulation



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### Bornhuetter-Ferguson-Initial Expected Losses Working Party

- IEL Obtained from Outside Source:
  - Pricing Indication
  - Industry loss ratio/loss costs
  - Corporate Plan
  - Underwriter loss ratio
  - Competitor loss ratio



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### Bornhuetter-Ferguson-Initial Expected Losses Working Party

- IEL Other:
  - Prior Selected Ultimate
  - Benktander
  - Experience Rating Results



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### Bornhuetter-Ferguson-Initial Expected Losses Working Party

- Proposed BFIEL Principles:
  - The purpose of estimating initial expected losses is to provide a (better?) predictor of future loss development that is not based directly on the current paid and outstanding losses.
  - If the estimate of initial expected losses is developed from past loss history and pricing and loss trend assumptions, then the estimate should be revised as the loss history develops and changes and/or the pricing and loss trend assumptions change.
  - The reliance to be placed on a loss projection based on an estimate of initial expected losses, relative to the reliance on loss projections based on other approaches, depends on the level of confidence in the estimate.



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### Bornhuetter-Ferguson-Initial Expected Losses Working Party

- Key Issues:
  - Many methods seem to use the link-ratio method to “improve” the IEL. Is this a good thing to do?
  - There seems to be a lot of actuaries that use their prior selected ultimate as their IEL for periods more than a year or two old. Is this really your “expected” loss ratio?



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### Dynamic Risk Modeling Handbook Working Party

- Sponsored by the Dynamic Risk Modeling Committee
- Completion: Late 2006
- Goal: Update, expand and revise the (renamed) “Dynamic Risk Modeling Handbook”
- Provide basic understanding and practical guidelines



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### Dynamic Risk Modeling Handbook Working Party

- Basic reference source
- Restructure and edit for consistency
- Add new “Introduction” and “Coherent Risk Measures” chapters
- Bibliography relating Investment concepts to Dynamic Risk Modeling



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## Dynamic Risk Modeling Handbook Working Party

- Chapters:
  - 1 – Introduction
  - 2 – Overview of DRM Process
  - 3 – Strategies
  - 4 – Scenarios
  - 5 – Asset Modeling

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## Dynamic Risk Modeling Handbook Working Party

- Chapters:
  - 6 – Liability Modeling
  - 7 – Pricing Models
  - 8 – Performance & Risk Measures
  - 9 – Coherent Measures of Risk
  - 10 – Presentation of DRM Results

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## Dynamic Risk Modeling Handbook Working Party

- Appendices:
  - A – Bibliography
  - B – Checklist of Considerations for DRM Modeling Process
  - C – Glossary to Terms

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## Public-Access DFA Model Working Party

- Sponsored by the Dynamic Risk Modeling Committee
- Completion: Late 2006
- Goals:
  - Phase I: Increase documentation – Post model and documentation on CAS Web Site
  - Phase II: Create a process to add to and improve the model components and processes
    - Open source, available to all

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## Public-Access DFA Model Working Party

- Current Model Includes:
  - Interest rate and inflation generator
  - Investment module
  - Pricing
    - Underwriting cycle
    - Jurisdictional Risk
  - Loss development and payment patterns.
  - Catastrophe module
  - Taxation
  - Financial statement development
  - Output

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## Public-Access DFA Model Working Party

- Documentation Process
  - Brief description of the module
    - (a) What it does
    - (b) How it interrelates with other components
  - Strengths of the module as it currently exists
  - Weaknesses of the current version of the module
  - Potential enhancements to the module
    - (a) Possible additions
    - (b) Possible deletions
    - (c) Possible changes to interrelationships within the module
    - (d) A personal assessment (High, Medium, Low) of the importance of each suggested enhancement

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## Tail Factors Working Party

- Sponsored by Committee on Reserves
- Completion: Late 2006
- Goal: Survey existing literature and identify additional methods in use, to educate students and help practitioners

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## Tail Factors Working Party

- Organized by “Type” of Method
- Sections Describe:
  - Mechanics of each method,
  - Examples for most methods,
  - Results of our Testing, and
  - Results of our Surveys

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## Tail Factors Working Party

- Standard Notation:
  - Consistency,
  - Started with Notation from Reserve Variability Working Party
  - Added new notation where lacking
- Summarize Areas for Future Research

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## Tail Factors Working Party

- Bondy-Type Methods
- Algebraic Methods
- Benchmark Methods
- Open Claim Methods
- Curve Fitting Methods
- Lifespan Methods
- Miscellaneous Methods

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## Areas for Future Joint Research?

- Topics of Interest to GIRO and the CAS?
  - Software Use
  - ERM Guidance Notes for General Insurance
- What about Canada, Australia and the Rest of the World?
- Questions / Discussion?

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