



Article from

**The Modeling Platform**

November 2018

Issue 8

# 2017 SOA Modeling Sessions, Part 2: SOA Annual Meeting & Exhibit

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**R**ecorded webcasts and virtual sessions are available for a fee, but Society of Actuaries (SOA) members have free access to audio recordings synchronized with slide presentations of many of the major 2017 SOA meetings: Life & Annuity Symposium, Health Meeting, Valuation Actuary Symposium and the SOA Annual Meeting & Exhibit. Slides from meeting presentations are downloadable and free to all online.

In addition, Modeling Section members have free access to Modeling Section–sponsored webcast recordings one year after they were produced. Check them out!

## SESSION 20 WORKSHOP: MULTIVARIATE SCENARIO REDUCTION TOOL USING R

**Moderator:** Mark M. Yu, FSA, MAAA

**Presenters:** Chin-Mei Yvonne Chueh, ASA, Ph.D.; Donald Davendra, Ph.D.; Tobias Gummertsbach

“The technology to amass data exceeds our abilities to make use of it.” People all over the globe are turning to R, an open source coding language for statistical computing. The R studio



may be applied to actuarial research and implementation with immediate applications to the current company model testing, as well as auditing tasks by insurance regulators. One example is various multivariate scenario reduction techniques being coded in R and C++ in our project to support the project sponsor and actuarial community (to empower their tool building and integrating research). The performance of R packages was compared with equivalent software packages. (See session slides at <https://www.soa.org/pd/events/2017/annual-meeting/pd-2017-10-annual-session-020.pdf>)

## SESSION 26 INTERACTIVE FORUM: MODEL RISK MANAGEMENT

**Moderator:** Yimin Yang

**Presenters:** George Alvites; Charlie Anderson, Ph.D.; Gang Ma, FSA

One important lesson learned from the recent financial crisis was that overreliance on financial models could lead to unforeseen and harmful consequences. Model risk management (MRM) is becoming a core and mandatory component in enterprise risk management for many financial institutions, especially Federal Reserve/Office of the Comptroller of Currency (OCC) Comprehensive Capital Analysis and Review (CCAR)–compliant firms. In recent years, insurance companies are also being required to have model risk management programs by Solvency II, Own Risk and Solvency Assessment (ORSA) and other supervisory guidance. MRM is not just model validation. It consists of governance and policies regarding a model’s life cycle including data, model development, model test and implementation, model validation, model monitoring and documentation. It also provides guidelines and standards for risk assessment and model inventory management. The presenters discussed current and best practice MRM, approach for model validation and auditing, as well as topics for technical issues such as types of model risks. They also discussed the differences between Fed/OCC standards and Solvency II standards. (See session slides at <https://www.soa.org/pd/events/2017/annual-meeting/pd-2017-10-annual-session-026.pdf>)

## SESSION 31 PANEL DISCUSSION: HURRICANE HARVEY: FLOOD CATASTROPHE RISK FINANCING AND MODELING

**Moderator:** R. Dale Hall, FSA, CERA, MAAA

**Presenters:** John Elbl; Carolyn Kousky

Presenters provided an update on the impact of Hurricane Harvey on insurance markets and government programs, the management of flood catastrophe risk through the U.S. National Flood Insurance Program, and an overview of the modeling of

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catastrophic risk from industry researchers. With new reinsurance techniques and cat models evolving to manage this risk, the presenters described how modeling of the risk can be used in estimating loss costs and how public/private financing programs are evolving. (See session slides at <https://www.soa.org/pd/events/2017/annual-meeting/pd-2017-10-annual-session-031.pdf>)

#### SESSION 49 PANEL DISCUSSION: PREDICTIVE ANALYTICS ASOPS: MODELING AND SETTING ASSUMPTIONS

**Moderator:** David N. Karo, ASA, MAAA

**Presenters:** Jason Jeffrey Altieri, ASA, MAAA;  
Eileen Sheila Burns, FSA, MAAA;  
Christine Hofbeck, FSA, MAAA

Predictive analytics is increasingly used to select, design, build and modify models intended to be used to set assumptions. This is a new area of practice for actuaries, with guidance only starting to evolve, and always in tandem with more traditional actuarial applications. The proposed Assumption Setting Actuarial Standard of Practice (ASOP) will “apply to actuaries performing actuarial services which include setting and/or assessing the reasonableness of assumptions.” The proposed Modeling ASOP will “apply to actuaries in all practice areas performing actuarial services when selecting, designing, building, modifying, developing, using, reviewing, or evaluating all types of models that are not simple models.” The presenters discussed these two important ASOP exposure drafts and their implications for practitioners in predictive analytics. (See session slides at <https://www.soa.org/pd/events/2017/annual-meeting/pd-2017-10-annual-session-049.pdf>)

#### SESSION 58 PANEL DISCUSSION: VALIDATION OF ASSET MODELS

**Moderator:** Rebecca Margaret Emily Kovach, FSA, MAAA

**Presenters:** Daniel B. Finn, FCAS; Scott D. Houghton, FSA, MAAA; Thomas V. Reedy, FSA, FIA, MAAA

For applications like principle-based reserving (PBR) and cash-flow testing, actuaries often validate and review models that

contain projections of both the asset and liability sides of the balance sheet. Actuaries are often insurance product and liability experts, but experience levels with assets vary. The presenters discussed model validation techniques that an actuary can apply to the asset side of the balance sheet. Specific topics included:

- Validation of asset cash flows, market values, and statement values
- Review of common assumptions for modeling assets
- Common modeling issues and their prevention
- Validation techniques to ensure that primary risks of different types of assets are captured
- Validation of interaction of assets and related balance sheet items
- Validation of interaction of assets and liabilities, including dividends and portfolio crediting
- Case studies with input and output

(See session slides at <https://www.soa.org/pd/events/2017/annual-meeting/pd-2017-10-annual-session-058.pdf>)

#### SESSION 79 PANEL DISCUSSION: NAVIGATING ASSUMPTION SETTING ACROSS VALUATION BASES

**Moderator:** Lisa Marie Veldman Domonkos, FSA, CERA, MAAA

**Presenters:** Sebastian Joseph Kleber, FSA, MAAA;  
Leonard Mangini, FSA, MAAA; Kevin Piotrowski, FSA, CERA, MAAA

View this session recording to understand the convergence of assumption setting across different valuation bases, including statutory (PBR), GAAP and embedded value. The presenters provided an overview of the role of assumption setting within these bases while highlighting similarities and differences. The role of credibility was discussed, with a focus on considerations and trade-offs of the two measures for PBR mortality assumption setting (Buhlmann and limited fluctuation). Monitoring and unlocking of assumptions and how this fits into the management of the business were explored. Key governance considerations were also highlighted. (See session slides at <https://www.soa.org/pd/events/2017/annual-meeting/pd-2017-10-annual-session-079.pdf>)



### SESSION 82 LECTURE: THE ROAD TO NORMALIZATION

**Moderator:** Hal Warren Pedersen, ASA

**Presenters:** Hal Warren Pedersen, ASA; Liang Yin, FSA, MAAA

The financial crisis led to global market conditions with few parallels in the historical record. Ultra-low and negative long-term interest rates have placed tremendous stress on insurers' ability to generate yield on investments. It now seems that markets are primed to return to more normal conditions. What might this road to normalization look like, and over what time period? What are the probable events that will lead to a normalization of interest rates? What might happen if the normalization process stalls?

The presenters discussed what we can learn from the historical data about periods of normalization and what risk modeling strategies can be employed to explore the ways in which the timing and magnitude of future rate increases might affect an insurance business. Specific topics included historical experience during periods of normalization, developing views on what our current road to normalization might look like, creating robust economic scenarios for measuring the risk in the normalization process, and allowing for an economic scenario generator (ESG) to accommodate scenarios that correspond to an arrested normalization of interest rates. (See session slides at <https://www.soa.org/pd/events/2017/annual-meeting/pd-2017-10-annual-session-082.pdf>)

### SESSION 102 PANEL DISCUSSION: IMPACT OF VM-20 ON LIFE INSURANCE PRICING

**Moderator:** Trevor D. Huseman, FSA, MAAA

**Presenters:** Carrie Lee Kelley, FSA, MAAA;  
William Gus Mehilos, FSA, MAAA

VM-20 has created an array of new issues and challenges for companies in pricing life insurance products. The presenters covered considerations, challenges and benefits of pricing new products under VM-20. The development of prudent estimate assumptions, including when you have limited experience, was discussed. Other topics included modeling and projecting VM-20 reserves, changes to the pricing process, emerging best practices to pricing under VM-20, and ways to address additional reserve volatility under VM-20. (See session slides at <https://www.soa.org/pd/events/2017/annual-meeting/pd-2017-10-annual-session-102.pdf>)

### SESSION 117 BUZZ GROUP: PREDICTIVE ANALYTICS: TECHNICAL TOOLS

**Moderator:** Eileen Sheila Burns, FSA, MAAA

**Presenters:** Peter J. Horman, FSA, MAAA; Christian Klose;  
Benjamin Williams

Practitioners from health, life and annuity product areas gave short presentations on a range of technical tools used to perform predictive analytics. Tools covered mathematical models, data management and agile workflow. The presenters adopted an Open Spaces format for the remainder of the session, and broke out into discussion groups to allow attendees to ask questions and share knowledge about the tools in which they are most interested. This was an opportunity to share use cases, best practices, frustrations, ideas and interact with others facing similar situations. (See session slides at <https://www.soa.org/pd/events/2017/annual-meeting/pd-2017-10-annual-session-117.pdf>)

### SESSION 122 PANEL DISCUSSION: LIVING TO 100: MORTALITY MODELING

**Moderator:** R. Dale Hall, FSA, CERA, MAAA

**Presenters:** Andrew Cairns; Stephen C. Goss, ASA, MAAA

The presenters gave attendees an educational overview of mortality modeling and an update on new mortality modeling techniques being researched, developed and implemented. Highlights included results emerging from research projects using a variety of familiar population and insured mortality data from the United States and around the world. Specific focus was given to how these techniques and findings can be implemented in actuarial practice. (See session slides at <https://www.soa.org/pd/events/2017/annual-meeting/pd-2017-10-annual-session-122.pdf>)

### SESSION 131 PANEL DISCUSSION: TRANSFORMING MANAGEMENT INFORMATION

**Moderator:** Timothy P. Noble, FSA

**Presenters:** Hunt M. Blatz, CFA; Mustafa B. Dinani, FSA, MAAA; Gavin Lubbe

Insurance companies produce a wide variety of data on a continuous basis to support business decisions and produce required regulatory reports. The intense level of change in the financial management of insurers in recent years has led to a demand for intelligent interpretation of the large amount of data and reports available. The presenters explored value-added functionality (data visualization, drill-down capabilities, etc.) to aid in the review of results, highlight what is driving the movement of results, and enhance the ability to communicate and explain results. In addition, the presenters discussed best practices for the platform to control and store the underlying data. Actuaries who review or communicate results gained insight into available tools in the marketplace and how to determine what underlying data requirements may be necessary.

The session did not endorse a business intelligence tool but rather shed light on what is available and how companies have put these tools into practice. Many companies are performing transformative activities, and the goal of the presenters was to critically think about and discuss the architecture of the end reporting stage. (See session slides at <https://www.soa.org/pd/events/2017/annual-meeting/pd-2017-10-annual-session-131.pdf>)

### SESSION 157 PANEL DISCUSSION: “ONE MODEL CONCEPT”—END GOAL OR GUIDING PRINCIPLE?

**Moderator:** Dave Czernicki, FSA, MAAA

**Presenters:** Hunt M. Blatz, CFA; Dave Czernicki, FSA, MAAA; Joseph P. Peterson, ASA, MAAA; Stephen T. Verhagen, FSA, MAAA

The presenters renewed discussion on the prospect of the “one model concept,” or the ability of an insurer to consolidate their model set down to a single set, platform or even a single model. Presenters defined the one model concept and discussed industry trends in the space, including efforts that are making the vision a possibility (such as vendor-provided platform developments, the transformation agenda, operating model evolution), and challenges standing in the way of the vision (such as regulatory changes, expanding demands on financial models). The presenters shared lessons learned from industry participants. (See session slides at <https://www.soa.org/pd/events/2017/annual-meeting/pd-2017-10-annual-session-157.pdf>)

### SESSION 158 PANEL DISCUSSION: LIVING TO 100: MODELING OF MORTALITY IMPROVEMENT

**Moderator:** Andrew J. Peterson, FSA, EA, FCA, MAAA

**Presenters:** Elena V. Black, FSA, EA, FCA, MAAA; Marianne C. Purushotham, FSA, MAAA

The techniques used to project mortality improvement have changed dramatically over the past two decades, evolving from simplistic “age-only” scales to today’s complex multidimensional models. In addition to providing an overview of mortality improvement models currently used by actuaries in the United States, United Kingdom and Canada, the presenters discussed some of the challenges faced by those trying to assess the effectiveness of the most widely used models. As available, findings related to the most recent updates to the Retirement Plans Experience Committee (RPEC) 2014 model, and its successive iterations of corresponding mortality improvement scales were discussed. (See session slides at <https://www.soa.org/pd/events/2017/annual-meeting/pd-2017-10-annual-session-158.pdf>)

### SESSION 173 PANEL DISCUSSION: PENSION MODELING AND SCENARIO ANALYSIS

**Moderator:** Brett Brooks Dutton, FSA, EA, FCA

**Presenters:** Matthew W. McDaniel, FSA, EA, FCA, MAAA; Thomas William McNab, FSA, EA

Pension modeling, the development of potential future financial outcomes for pension plans and their sponsors, is a critical component of the value that actuaries provide to their pension clients. Pension modeling is used for many purposes, including budgeting, strategic planning and risk management. The presenters sought to survey the wide and evolving range of approaches to pension modeling, addressing such questions as:

- For what purposes should models be constructed? What range of modeling approaches exists, and what factors should be considered when selecting a modeling approach?
- What are key considerations in model construction (e.g., assumption setting, liability forecasting, and asset forecasting)?
- How can an actuary effectively communicate key model outcomes to a client?

Although the presenters’ primary work experience is with U.S. corporate defined-benefit plans, the content of the session was general in nature in order to offer relevant insight across multiple regulatory frameworks (private/public sector, U.S./Canada, etc.). (See session slides at <https://www.soa.org/pd/events/2017/annual-meeting/pd-2017-10-annual-session-173.pdf>)

### SESSION 174 PANEL DISCUSSION: NEWLY PROPOSED ASOPs: PRICING, MODELING AND SETTING ASSUMPTIONS

**Moderator:** David C. Armstrong, FSA, MAAA

**Presenters:** Nick Fiechter, FSA, MAAA; Maria Rose Itteilag;  
Donna Christine Megregian, FSA, MAAA

The panel discussion covered three important Actuarial Standard of Practice (ASOP) exposure drafts titled Pricing of Life Insurance and Annuity Products; Modeling; and Setting Assumptions; recently proposed by the Actuarial Standards Board. The draft Pricing of Life Insurance and Annuity Products ASOP “applies to actuaries when performing actuarial services with respect to the pricing of life insurance and annuity products, including riders, that will be sold in the future.” The proposed Assumption Setting ASOP will “apply to actuaries performing actuarial services which include setting and/or assessing the reasonableness of assumptions.” The proposed Modeling ASOP will “apply to actuaries in all practice areas performing actuarial services when selecting, designing, building, modifying, developing, using, reviewing, or evaluating all types of models that are not simple models.” Actuaries use numerous models that have various applications (e.g., economic capital, GAAP reporting, pricing, etc.). It’s important that the use of assumptions is appropriate in light of the model’s intended purpose. Focused topics of discussion addressed what these newly proposed ASOPs mean for the actuary. (See session slides at <https://www.soa.org/pd/events/2017/annual-meeting/pd-2017-10-annual-session-174.pdf>)

### SESSION 176 PANEL DISCUSSION: EMERGING TRENDS IN MODEL RISK MANAGEMENT FOR SMALL COMPANIES

**Moderator:** Vikas Sharan, FSA, FIA, MAAA

**Presenters:** Brody D. Lipperman, FSA, CERA, MAAA;  
Stefanie J. Porta, ASA, MAAA; Vikas Sharan, FSA, FIA, MAAA

The presenters discussed some of the latest trends in model risk management (MRM), with a focus on companies that are not required by regulators to validate their models. The session started with an overview of typical MRM approaches used by Fed-regulated organizations (which are required to undertake frequent validation exercises). The presenters then discussed constraints and challenges faced by small to mid-sized companies when it comes to MRM. The session offered perspectives on various aspects of MRM, such as resourcing, validation

approaches and independence of roles, that these companies can utilize in their organization to build upon a successful MRM function. (See session slides at <https://www.soa.org/pd/events/2017/annual-meeting/pd-2017-10-annual-session-176.pdf>)

### SESSION 178 PANEL DISCUSSION: INDIVIDUAL LIFE MORTALITY EXPERIENCE STUDY

**Moderator:** Mervyn Kopinsky, FSA, EA

**Presenters:** Brian D. Holland, FSA, MAAA; Kevin P. Larsen,  
ASA, MAAA; Tony R. Phipps, FSA, MAAA

The SOA Individual Life Experience Committee presented the results of its latest mortality experience study. This study covers experience between 2003 and 2013 on fully underwritten life insurance policies. The results included experience split along multiple dimensions including duration, face amount bands, smoking status and underwriting class. (See session slides at <https://www.soa.org/pd/events/2017/annual-meeting/pd-2017-10-annual-session-178.pdf>)

### SESSION 191 LECTURE: USE OF CATASTROPHE MODELS BY GENERAL INSURANCE COMPANIES

**Moderator:** Anthony E. Cappelletti, FSA, FCAS, FCIA

**Presenters:** Alan Frith, ARe, CCM, CPCU

There exist catastrophe models for a number of natural and man-made catastrophes. Primarily, the output produced by these models is used by general insurers to determine their exposure to catastrophic events and assist the insurer in managing this risk (e.g., optimizing reinsurance). Reinsurers use the output to price reinsurance that covers catastrophes. However, the output from catastrophe models can be used for other purposes. During this session presenters explored the use of catastrophe models by general insurance companies beyond their use as a tool for catastrophe reinsurance. (See session slides at <https://www.soa.org/pd/events/2017/annual-meeting/pd-2017-10-annual-session-191.pdf>) ■



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