2020 VIRTUAL ANNUAL MEETING & EXHIBIT

OCTOBER 26-29, 2020
Driving Actuarial Innovation

Industry Panel Discussion

October 26th, 2020
SOCIETY OF ACTUARIES
Antitrust Compliance Guidelines

Active participation in the Society of Actuaries is an important aspect of membership. While the positive contributions of professional societies and associations are well-recognized and encouraged, association activities are vulnerable to close antitrust scrutiny. By their very nature, associations bring together industry competitors and other market participants.

The United States antitrust laws aim to protect consumers by preserving the free economy and prohibiting anti-competitive business practices; they promote competition. There are both state and federal antitrust laws, although state antitrust laws closely follow federal law. The Sherman Act, is the primary U.S. antitrust law pertaining to association activities. The Sherman Act prohibits every contract, combination or conspiracy that places an unreasonable restraint on trade. There are, however, some activities that are illegal under all circumstances, such as price fixing, market allocation and collusive bidding.

There is no safe harbor under the antitrust law for professional association activities. Therefore, association meeting participants should refrain from discussing any activity that could potentially be construed as having an anti-competitive effect. Discussions relating to product or service pricing, market allocations, membership restrictions, product standardization or other conditions on trade could arguably be perceived as a restraint on trade and may expose the SOA and its members to antitrust enforcement procedures.

While participating in all SOA in person meetings, webinars, teleconferences or side discussions, you should avoid discussing competitively sensitive information with competitors and follow these guidelines:

• Do not discuss prices for services or products or anything else that might affect prices
• Do not discuss what you or other entities plan to do in a particular geographic or product markets or with particular customers.
• Do not speak on behalf of the SOA or any of its committees unless specifically authorized to do so.
• Do leave a meeting where any anticompetitive pricing or market allocation discussion occurs.
• Do alert SOA staff and/or legal counsel to any concerning discussions
• Do consult with legal counsel before raising any matter or making a statement that may involve competitively sensitive information.

Adherence to these guidelines involves not only avoidance of antitrust violations, but avoidance of behavior which might be so construed. These guidelines only provide an overview of prohibited activities. SOA legal counsel reviews meeting agenda and materials as deemed appropriate and any discussion that departs from the formal agenda should be scrutinized carefully. Antitrust compliance is everyone’s responsibility; however, please seek legal counsel if you have any questions or concerns.
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Meet Our Panelists:

Moderator

Henry Chen  
FSA, FCIA, MAAA  
Manager  
Ernst & Young LLP

Max Maughan  
FSA, MAAA  
Senior Actuary, Actuarial Modernization  
Nationwide

Doug Kraft  
FSA, MAAA  
Head of US Actuarial Management LH  
Swiss Re

Jamie Warner  
MS in Statistics, CPCU, AIDA  
Director, Advanced Analytics and Data Science  
Swiss Re

Eric Pahl  
FSA, MAAA  
Actuary, Retirement  
Lincoln Financial Group
The Winds of Change
The insurance industry, like many, is rapidly evolving and innovating in response to persistent growth challenges and key global megatrends

<table>
<thead>
<tr>
<th>Low interest rates</th>
<th>Rising expectations</th>
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<tr>
<td>Changing demographics</td>
<td>Technology innovation</td>
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Emerging Challenges
COVID-19 is one example of external forces that can force industries to change quickly and address new challenges

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<thead>
<tr>
<th>Customer centricity and financial well-being</th>
<th>Digitalizing distribution</th>
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<tbody>
<tr>
<td>Winning the war for talent</td>
<td>Achieving cost efficiency</td>
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The Future of Actuarial: strategic, agile, and lean

Actuarial Mission, Purpose, and Vision

- The engineers and stewards of financial well-being
- Creative problem-solvers, thought leaders, and innovators
- Strategic advisors requiring financial and risk decision support
- Agile business partners and change agents

Flip from Process to the Strategy

- Support company strategy
- Performance monitoring and steward financial well-being
- Process-driven, computational, and repetitive tasks

Past
Future

Lack of focus
Area of importance
Base key focus

Non-key focus
Area of importance
Base key focus

Past
Future

- Support company strategy
- Performance monitoring and steward financial well-being
- Process-driven, computational, and repetitive tasks

Lack of focus
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Non-key focus
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Strategic focus: what’s new and different?

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<tr>
<th>Product Innovation</th>
<th>Accelerated innovation of products to address changing customer needs and preferences</th>
<th>New and simplified solutions will emerge in the digital world</th>
<th>New products for hyper-low interest rates are needed</th>
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<tr>
<td>Financial reporting and analysis</td>
<td>End-to-end automation of actuarial valuation processes to increase efficiency</td>
<td>Emphasis on designing, managing, controlling, and leveraging complex systems, processes, and data</td>
<td>Emphasis on analyzing results and providing actionable business insights</td>
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<td>Financial projections</td>
<td>Critical to provide forward-thinking decision support</td>
<td>Increased business demands of visibility into diverse scenarios</td>
<td>Nimble processes and rapid turnaround times</td>
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<td>Risk management, ALM, and hedging</td>
<td>Continued risk management on capital and hedging</td>
<td>Increased emphasis on general account asset/liability management</td>
<td>Complex combinations of risks and the critical nature of risk management programs</td>
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<td>Experience Analytics and Modeling</td>
<td>Innovated experience study through big data technology</td>
<td>Integration of AI, machine learning, and analytics with traditional actuarial modeling</td>
<td>Opportunities to partner with data scientists to create additional values</td>
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<tr>
<td>Customer value</td>
<td>More emphasis on development of customer-centric business</td>
<td>Generating value from customer and distributor relationships</td>
<td>Strategies to generate greatest impact on enterprise value</td>
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Model Output Visualization

Max Maughan, FSA, MAAA
Use of data visualization tools to analyze actuarial results

Modernization thoughts

• Traditional Actuarial analysis
  • Siloed
  • End-to-End process ownership

• Ideas for improvement
  • More similarities than differences
  • Opportunity for efficiency
MOAT (Model Output Analysis Tool) aka “Mother Of All Tools”

What
• Centralized tool that visualizes model output

Why
• Consistency in report structure, hierarchy, and terminology across products, modeling platforms and teams

How
• Start with the data!
• Technical aspects
MOAT - Live Demo

Demo - Part 1

Demo - Part 2
Monitoring Experience with Modern Tools

Doug Kraft, FSA, MAAA
Improvemements in Monitoring

• Interconnected data from disparate sources via Palantir Foundry
  • data lineages can still be traced

• Data can be manipulated separately without impacting the data sources themselves
  • millions of rows can be efficiently filtered, connected or adjusted
  • reports and processes can be refreshed quickly
Improvements in Monitoring

- Strong visualization capabilities within the software

Customized Quarterly AvsE Report – ties variances to data/inforce changes, mortality, persistency, model or assumption updates, etc.

Mortality AvsE – sourced from both seriatim and bulk reported claims, changes in IBNR, and live Expected from actuarial models updated with current inforce and assumptions
Swiss Re Atelier Program
Innovation exercised by local teams, facilitated by a central team

**Upskilling on Programming, Data Science, Communication**

- **Atelier Workshops** tailored to tackle business-as-usual problems – 316 participants in 30 workshops since Oct 2018. Any region, L&H or P&C, often reserve review & validation or experience-based assumption setting.

- **Atelier Masterclass**: Customized classes to prepare participants for workshops – 2 topics developed (data manipulation and generalized linear models in R), 4 planned

- Access to additional online training platform

**Community**

- **Atelier Meetups** build a collaborative community on data analytics topics – 180+ participants each month

- MS Teams as a platform for active knowledge exchange – 270+ members

- Develop and share guidelines for best practice programming, statistical modelling, data science and communication

- Provide advice and support on modelling and analytics projects

- **A rotation hub** – colleagues rotate-in and develop data analytics and consultation skills

- **A skills incubator** - Graduates develop domain expertise and data science skills before moving on to other roles

**Infrastructure**

- **Atelier Workbench** provides access to analytical tools to business users such as access to R from a server, publishing of interactive dashboards created using R and Git version control. 250+ business users across the Group

![Screenshot from output from a recent workshop with a L&H Actuarial Team](image)

A step-by-step approach focuses first on communication and efficiency, then reinforcing traditional statistical modelling knowledge which is often under-used and extends to techniques suited to larger and more complex data.
Talent Upskilling for Actuaries

Jamie Warner, MS in Statistics, CPCU, AIDA
Eric Pahl, FSA, MAAA
The actuarial function needs to adapt to take on new challenges.

Predictive analytics provides actuaries with additional ways to evaluate and model data, which will yield improved results.
New techniques help answer five key types of questions...

1. **CLASSIFICATION**
   - **ACTUARIAL:** Will this policy surrender in the next 12 months?

2. **ANOMALY DETECTION**
   - **UNDERWRITING:** Are these prescriptions typical for reported health?

3. **COUNTING**
   - **PRODUCT:** What are our total expected sales?

4. **CLUSTERING**
   - **MARKETING:** Which potential customers respond to the same way?

5. **REINFORCEMENT LEARNING**
   - **RETENTION:** What action should we take given the likelihood this policy will lapse?
Lincoln targeted seven key upskilling areas

1. When to use predictive analytics
2. How to ask the right questions
3. Data sources and structure
4. Exploratory data analysis
5. Tool and programming knowledge
6. Data visualization
7. Data ethics
Lincoln’s approach included innovative partnerships with the SOA and Udemy.

- **Actuarial Leadership**: 45 Senior Leaders
- **Credentialed Actuaries**: 180+ Actuaries and IT partners
- **Actuarial Development Program**: 95+ Actuarial students
- **Internal partners drove Lincoln relevance**:
  - IT leaders
  - Analytics and data science experts
  - HR leaders with change management expertise
  - Senior actuarial leaders
Lincoln created targeted training for actuaries at different levels of experience.

**Phase 1 Data & Analytics**

- **Actuarial Leadership**
  - Data Analytics for Leaders
  - Length: 2 day seminar

- **Credentialed Actuaries**
  - Data Analytics Foundations
  - Length: 2 day seminar & 60 hours e-learning

- **Actuarial Students**
  - Data Analytics Beginnings
  - Length: 1 day seminar & 20 hours e-learning

**Phase 2 Predictive Analytics**

- **Credentialed Actuaries**
  - Predictive Analytics Foundations
  - Length: 2 day seminar & 60 hours e-learning
Upskilling participants are already applying new skills to their work

Lessons learned

• Balancing day job with upskilling is difficult, particularly for senior levels
  • In the future, approach AVPs and senior managers with less technical training
• Manager support at all levels is crucial
• **Try not to schedule during a global pandemic**

Example Application

One employee applied some R data wrangling skills learned from the modules to manipulate U.S. census data for COVID-19 analysis.

• Employees that would normally attempt to transpose and clean data in Excel used R on large datasets, allowing for rapid data cleaning and processing that can be replicated and automated
• Tableau visualizations allowed for digestible graphics for senior management
Panel Discussion