

THE

VOLUME 13 ISSUE 4

Actuary

AUG
16
SEP

20

EXPAND. EVOLVE.

A discussion of insurance regulation around the globe

28 HARNESSING NEW CHANGES

Introducing the SOA's web-based regulatory resource

32 PREPARE FOR LANDING

What actuaries need to know about the new fiduciary conflict rule

36 ASA: REIMAGINED

Announcing exciting changes to the ASA pathway

40 THE INSIDE TRACK

Q&A with Predictive Resources LLC
CEO Vince Granieri



SOCIETY OF
ACTUARIES



Back row (l to r): Steven Frost, Jennifer Hart, Jill Grayson, Claudine Cox, Lauren Lee, Jesse West,
Front row (l to r): Bonnie Ten-Pow, Barbara Roman, Aimee Kaye, Ted Jackness, Robyn Taylor, Patty Kent.

We're at the Front

**We are at the forefront of the market,
on the frontline with industry trends and exclusive listings,
and always upfront with our clients and candidates.**



ACTUARIAL CAREERS, INC.®

Westchester Financial Center / 11 Martine Avenue, 9th Floor, White Plains, NY 10606

Tel: 914-285-5100 / Toll Free: 800-766-0070 / Fax: 914-285-9375

E-mail: jobs@actuarialcareers.com

www.actuarialcareers.com



THE Actuary

VOLUME 13 ISSUE 4

AUG 16 SEP



WE ARE PLEASED TO ANNOUNCE THAT *THE ACTUARY* WON AN APEX AWARD OF EXCELLENCE FOR BEST REDESIGN, AND SILVER AND BRONZE EXCEL AWARDS FOR DESIGN EXCELLENCE.



20

28

32

20

EXPAND. EVOLVE.

Larry Bruning, Gaetano Geretto, Klaas Stijnen and Ling Ling Wang discuss insurance regulation around the globe

Moderated by Albert Moore

28

HARNESSING NEW CHANGES

Introducing the SOA's new web-based regulatory resource

By Joe Wurzburger

32

PREPARE FOR LANDING

What actuaries and employers need to know about the new fiduciary conflict rule

By Jason M. Levy

36

ASA: REIMAGINED

Announcing exciting changes to the ASA pathway

By Jeremy J. Brown

40

THE INSIDE TRACK

Q&A with Vince Granieri, CEO of Predictive Resources LLC

FEATURES



ONLINE!

Be sure to visit our digital edition at theactuarymagazine.org.



36

40

SOA PRESIDENT

Craig W. Reynolds
FSA, MAAA
craig.reynolds@soa.org

SOA STAFF CONTACTS

Patrick Gould
Managing Director of
Marketing & Communications
pgould@soa.org

Cheré LaRose
Director of Member &
Candidate Communications
clarose@soa.org

Julia Anderson Bauer
Publications Manager
jandersonbauer@soa.org

Jacque Kirkwood
Magazine Staff Editor
jkirkwood@soa.org

CREATIVE SERVICES



The Actuary is published bimonthly (February, April, June, August, October, December) by the Society of Actuaries, 475 N. Martingale Rd., Suite 600, Schaumburg, IL 60173-2226. Periodicals postage paid at Schaumburg, IL, and additional mailing offices. USPS #022-627.

This publication is provided for informational and educational purposes only. Neither the Society of Actuaries nor the respective authors' employers make any endorsement, representation or guarantee with regard to any content, and disclaim any liability in connection with the use or misuse of any information provided herein. This publication should not be construed as professional or financial advice. Statements of fact and opinions expressed herein are those of the individual authors and are not necessarily those of the Society of Actuaries or the respective authors' employers.

The Actuary is free to members of the Society of Actuaries. Nonmember subscriptions: students \$22; North American \$43; Int'l \$64.50. Please send subscription requests to: Society of Actuaries, P.O. Box 95600, Chicago, IL 60694-5600.

CONTRIBUTING EDITORS

Richard Berger, FSA, EA, MAAA
rberger5@ptd.net

Mark Birdsall, FSA, FCA, MAAA
mbirdsall@ksinsurance.org

Alan Cooke, FSA, FCIA, MAAA
alancookebc@gmail.com

Carl Hansen, FSA, EA, FCA, MAAA
chansen@bwcigroup.com

Christine Hofbeck, FSA, MAAA
christine.hofbeck@prudential.com

Albert Moore, ASA, MAAA
albert_moore@ohionational.com

Jeffrey Schuman, FSA, MAAA
jrschuman@outlook.com

Achille Sime, FSA, CERA, MAAA, FIAF
asime@sl-financial.com

Ksenia Whittal, FSA, MAAA
ksenia.whittal@milliman.com

Larry Zhao, FSA, CERA
larry.zhao@axa.us.com

DEPARTMENTS

- 6 **EDITORIAL** *Regulation and Risk Are Opportunities*
- 10 **FROM THE PRESIDENT** *Predictive Analytics and New Opportunities*
- 14 **AROUND THE GLOBE** *Looking East: A roundup of news from the global community*
- 16 **NEW & NOTEWORTHY** *Shooting for the Moon: Your source for industry briefings and SOA news*
- 46 **TOOLBOX** *Fast and Free: Useful tools and resources for actuaries*
- 48 **INNOVATE** *Constructing the Framework: Developing a concept map for predictive analytics*
- 52 **RESEARCH** *Social Impact*
- 54 **TAKE CHARGE** *Information on Professional Development Opportunities*

ADVERTISING INFORMATION

Inquiries about advertising should be directed to:

M.J. Mrvica Associates Inc.
2 West Taunton Avenue
Berlin, NJ 08009
Phone: (856) 768-9360
Fax: (856) 753-0064
Email: dmather@mrvica.com

POSTMASTER: Send address changes to the SOA, c/o Communications Department, 475 N. Martingale Rd., Suite 600, Schaumburg, IL 60173-2226.

ACTUARIAL RECRUITMENT YOU CAN COUNT ON

actuaries@EzraPenland.com

BERMUDA – LIFE REINSURANCE ACTUARY

For Position 71651, a Bermuda client now seeks a life reinsurance actuary. Financial reinsurance experience preferred. FSA or FCIA or FIA or FIAA ideal. Requires a strong understanding of Solvency II, IFRS and Economic Capital. This is a high profile financial reporting role.

MIDWEST USA – LIFE CONSULTING ACTUARY

For Position 71158, a Midwest USA consulting firm plans to hire a Life Consulting Actuary. Fellow of the Society of Actuaries (FSA) required. Must have 10+ years of life and annuities actuarial experience. Mentor staff. Work on asset/liability modeling, cash flow testing, valuation, mergers and acquisitions, pricing, product development, ORSA support and other assignments. You must be exceptional at your work.

CHINA – DEPUTY CHIEF LIFE ACTUARY

Shanghai, China life insurer seeks a Deputy Chief Actuary for Position 70701. Native Chinese-born actuaries who are working in the US and who would like to return to China are the ideal candidates. 15+ years of life actuarial experience preferred, with a well-rounded background of pricing, financial reporting, valuation and modeling. FSA required. Management experience a must.

NEW YORK – LIFE ASA/FSA

Software company seeks life actuary with broad exposure to universal life, variable universal life and term life insurance for Position 71474 in New York. FSA or ASA preferred.

MINNESOTA – LIFE VALUATION ACTUARY

For Position 70149, a Minnesota insurer has asked us to find a life insurance valuation actuary. ASA or recent FSA sought. Requires 3 to 10 years of life actuarial experience.

MASSACHUSETTS – LEAD HEALTH ACTUARY

Massachusetts health insurer has asked Ezra Penland, the Leader in Actuarial Recruitment, to find a Lead Health Actuary for Position 71384. Requires ASA or FSA with 10+ years of health actuarial experience. Manage pricing, product development, rate filings, cost trends studies, reserve analysis, contract analysis and special projects. Compensation up to \$200K.

MICHIGAN – HEALTH CONSULTING ACTUARY

For Position 71532, our Michigan client seeks a health consulting actuary to work on retiree medical valuations and plan design. ASA or FSA with 5 to 15 years of actuarial experience preferred.

ILLINOIS – HEALTH LEADERSHIP ROLE

For Position 70878, an FSA health actuary is sought for a leadership role by an Illinois health insurer. Must have 10+ years of experience. Medicare and Medicaid experience ideal. Pricing experience especially important.

VIRGINIA – HEALTH AND BENEFITS ACTUARY

For Position 70840, our Virginia client plans to hire a health and benefits consulting actuary. FSA or ASA with OPEB valuations and Medicare/Medicaid pricing experience sought.

FLORIDA –

SR. DIRECTOR AND HEALTH ACTUARY

For Position 71316, a Fort Lauderdale, Florida client is searching for a senior director and health actuary. FSA or ASA with 10+ years of healthcare actuarial experience ideal. Management experience required.



EZRA PENLAND
ACTUARIAL RECRUITMENT

Over 40 Years of Industry Experience
(800)580-3972
actuaries@EzraPenland.com

These Roles and Many Other Actuarial Jobs Can Be Found at EzraPenland.com

Regulation and risk are opportunities

BY ALBERT MOORE

I often comment that technology is a universal language. Actuaries everywhere understand Excel spreadsheets. Travel the world, and you will see teenagers and adults with their faces glued to small handheld devices. The internet keeps us all connected. When it comes to technology, we live in a global economy. Adapt, or be left behind.

For insurance professionals, insurance regulation has become a global force. This issue of *The Actuary* has several articles about regulation. Actuaries must understand and account for the global regulatory risk. Yet, most of us think locally. Actuaries must begin to adapt and consider global insurance regulation while continuing to grow in our professional responsibility to serve the public interest.

I find technology utterly fascinating. I look forward to my copy of *Technology Review*, a magazine published by my alma mater, the Massachusetts Institute of Technology (MIT).

I keep abreast of technological developments and adoption.

I also find civics, law and government extremely interesting, and I find history fascinating as well. My family keeps me supplied with many audio books during my commute. Most are historical fiction written by G.A. Henty, who wrote more than 122 novels. Some are deemed controversial because of his perspective on history. I particularly enjoy *Wulf the Saxon: A Story of the Norman Conquest*. My next book likely will be *With Lee in Virginia, A Story of the American Civil War*.

In addition to my interest in technology, law and history, insurance regulation is one of my many topics of interest. My very first assignments entailed writing programs to calculate newly-introduced U.S. regulatory requirements in the Deficit Reduction Act of 1984 (DEFRA) and Tax Equity and Fiscal Responsibility Act of 1982 (TEFRA). Modeling software was being introduced at the time to meet new cash flow testing demands.

Technology, law, history, Robert E. Lee and insurance

regulation all remind me of the topic of my commentary. Consider the legal case: PAUL v. VIRGINIA, 75 U.S. 168 (8 Wall. 168, 19 L.Ed. 357).

“An act of the legislature of Virginia, passed on the 3d of February, 1866, provided that no insurance company, not incorporated under the laws of the State, should carry on its business within the State without previously obtaining a license for that purpose; and that it should

not receive such license until it had deposited with the treasurer of the State bonds of a specified character, to an amount varying from thirty to fifty thousand dollars, according to the extent of the capital employed. The bonds to be deposited were to consist of six per cent. bonds of the State, or other bonds of public corporations guaranteed by the State, or bonds of individuals, residents of the State, executed for money lent or debts contracted after the passage of the act, bearing not less than six per cent. per annum interest.”¹



Continued on page 8



*It Takes One to Know One...
An Actuary Placing Actuaries*

The Perfect Fit...

Pauline Reimer, ASA, MAAA
PRYOR
Executive Search

For more than twenty five years, Pauline Reimer, ASA, MAAA, has been finding the right positions for actuaries, modelers, and risk professionals both nationally and internationally.

To find your perfect fit, please contact her at:

pauline@ppryor.com
(516) 935-0100 x307 or (866) 6-ACTUARY
www.ppryor.com

Continued from page 6

One of the questions raised by Samuel Paul, a resident of Virginia who served as the agent for companies and individuals primarily from New York, was whether the state law was unconstitutional because aspects of the law ran afoul of the Commerce Clause of the U.S. Constitution. Did states have the right to regulate insurance? In Article I of the U.S. Constitution, Congress is given the power “to regulate commerce with foreign nations, and among the several States.”

The Supreme Court held: “We perceive nothing in the statute of Virginia which conflicts with the Constitution of the United States; and the judgment of the Supreme Court of Appeals of that State must, therefore, be affirmed.” Thus, state regulation of insurance within the United States was settled in 1868.

The purposes and emphasis of insurance regulation are not static. In the United States, the nature of insurance regulation has changed dramatically over the past few decades. I see the following general trend in insurance regulation in the United States: It began with regulation and prescription of licensing and legal rules and definitions. Insurance regulation then was subject to insurance taxation and market oversight. Finally, consumer protections were erected.

The evolving insurance regulation continued with the passage of TEFRA and DEFRA to clearly define insurance from other financial instruments. The Technical And Miscellaneous Revenue Act of 1988 (TAMRA) was introduced to regulate consumer manipulation of the insurance taxation benefits. Regulators became concerned with capital adequacy. Solvency concerns have been the most recent regulatory focus in the United States and around the globe.

Today, I see a growing call for changes in the advisory role of insurance professionals. A related issue is an evaluation of the appropriateness of a financial instrument to meet the needs of a client. More than ever, actuaries and the insurance industry must help frame the debate.

The most recent example in the United States is the proposed rule from our Department of Labor (DOL) that would require brokers working with retirement accounts to act in the best interest of clients. I believe brokers already generally act in the best interests of clients. I do not want to enter that debate.

I only raise the DOL rule as an example of increased global regulation. It should serve as evidence that regulation in Europe, Asia, Canada and the United States will likely be discussed and incorporated in a country, state or province near you. In this issue of *The Actuary*, we interviewed four actuaries from around the globe to gain insight into their nations’ regulatory frameworks.

Consider the following perspective of Patrick Collinson as written in *The Guardian*: “New rules that ban commission-based selling are due to come into force on New Year’s Eve in the biggest shake-up of the investment industry for decades, dubbed by some ‘the death of the salesman.’”²

Some in the United States likely would have assumed the author was addressing the DOL rule. However, this statement was written on Dec. 30, 2012, describing the evolving regulation introduced in the United Kingdom. That regulation had the stated goal to allow clients to “see clearly the cost of financial advice.” The main force of the reforms can be traced back to pension industry reforms in 2006.

My point is that actuaries who believe that a global perspective is unnecessary should examine the globalization of the regulatory risk. Proposed changes and reforms in one nation may soon be the discussion in another.

Regulators already have begun to think and act globally. Many national regulatory bodies have begun to establish channels of communication across borders and seas. Technology has made the world a smaller place by revolutionizing the speed of travel and communication. Technology has facilitated the ability for actuaries to develop very complex models and perform analysis that could never have been achieved in the past.

With the increasing complexity of insurance products, our industry will be challenged to ensure our clients have all of the information and tools to understand what they are buying. Read the article on page 28 that explains the SOA’s new regulatory change web resource. Actuaries must expand their perspectives to include an increasing responsibility in understanding and managing the regulatory risk. Risk is indeed opportunity. ■

References

¹ www.law.cornell.edu/supremecourt/text/75/168

² Collinson, Patrick. “FSA Ban on Commission-based Selling Sparks ‘Death of Salesman’ Fears.” *The Guardian*. Dec. 30, 2012. <https://www.theguardian.com/business/2012/dec/30/fsa-ban-commission-selling-death>.

Albert J. Moore, ASA, MAAA, is second vice president, Actuarial Systems, at Ohio National Financial Services in Cincinnati.

albert_moore@ohionational.com



Experiment with insurers' BCAR scores under changing conditions



***Best's Capital Adequacy Ratio Adjustment System – P/C, US* lets you test multiple “what-if” scenarios just as an A.M. Best analyst would.**

Best's Capital Adequacy Ratio (BCAR) is a calculation A.M. Best analysts use to test the impact of scenarios that affect an insurer's financial outcomes.

The ***BCAR Adjustment System – P/C, US*** is a desktop application that provides online access to the same base model and data used by A.M. Best to calculate the BCAR score for approximately 3000 single and group U.S. property/casualty companies.

***BCAR Adjustment System* users always have access to the same base model that A.M. Best uses in its published BCAR scores.** Experiment with various scenarios with this highly sophisticated analytical tool.

Call for more information: (908) 439-2200, ext. 5311, or email sales@ambest.com



www.ambest.com/sales/bcarsystem

NOTE: The results or output created by use of the *Best's Capital Adequacy Ratio Adjustment System* ("Output") is for informational and internal purposes only, and such Output may not match or be consistent with the official BCAR score that A.M. Best publishes for the same company. The Output is not guaranteed or warranted in any respect by A.M. Best.

The *BCAR Adjustment System* is a non-rating services product, and its purchase is not required as part of the rating process.



BY CRAIG W. REYNOLDS

Craig W. Reynolds, FSA, MAAA, is president of the Society of Actuaries.

from the **PRESIDENT**

craig.reynolds@soa.org

Twitter: @CraigWReynolds

LinkedIn: [LinkedIn.com/company/craig-reynolds](https://www.linkedin.com/company/craig-reynolds)

Predictive analytics and new opportunities

Predictive analytics, big data and predictive modeling are terms most of us have undoubtedly heard, especially during this past year. The discussion of these topics has certainly evolved quickly from “what is it?” to best practices and new ideas for practical applications. As actuaries, we know data and modeling. We can argue that we are the original users of big data. We can provide a comprehensive approach to build and validate models within our industry and in other industries, too.

The Society of Actuaries’ (SOA’s) Cultivate Opportunities Team (COT)¹ has been a big part of our efforts to create a foothold for actuaries in this field, both inside and outside traditional actuarial employment. Also, those working on the Learning Strategy have developed a number of curriculum changes designed to better prepare actuaries to be successful in these fields.

I would like to share some of the advancements of practicing actuaries and also the SOA’s preparations for future actuaries. We must look at today’s challenges as well as tomorrow’s.

At the start of the year, the SOA launched an advertising campaign on predictive analytics to reach health employers. We developed a brochure² to emphasize the work of actuaries with health care predictive modeling and data analysis. This work helps employers and recruiters understand the roles actuaries can play within health care, especially when it comes to predictive analytics.

Did you know we have offered actuarial internships to employers outside of the insurance industry? Our internships help expose employers to the knowledge and skill sets actuaries can bring to their companies. For example, Validate Health shared that its intern’s theoretical knowledge in computer science and actuarial science was concretely applied to model development within a provider managed care context. We are glad to have this feedback, and we secured several more internships this past summer with Microsoft, NASA and a number of health companies that utilize data analytics.

Continued on page 12



Willis Towers Watson Unify

Software Integration, Automation and Governance

Do more, faster, for less

You need richer, deeper analysis, developed quickly with a process that incorporates strict governance and controls.

Willis Towers Watson Unify provides exceptional capabilities for integration, automation and governance of your financial modeling and reporting processes so you can run them with greater efficiency and consistency, and proper governance.

Let us show you how your company can rise to a higher standard of performance in risk and capital management with Willis Towers Watson Unify. Visit towerswatson.com/unify or email software.solutions@willistowerswatson.com for more information.

from the **PRESIDENT**

Continued from page 10



In June 2016, the SOA Board of Directors approved changes to the ASA curriculum. One of the important drivers is predictive analytics. Under our new approach, candidates will use computer packages to learn—in a hands-on way—how to apply the principles of predictive analytics with realistic data sets.

For practicing actuaries, we offer continuing education concurrent sessions, webinars and other materials on predictive analytics. Soon we will offer a certificate pilot program in self-study and assessment for fellows who want to make a material commitment to learning this material. The pilot will be open to a limited number of participants, and it is geared toward actuaries with five or more years of SOA membership. We currently are building this program as a relatively deep dive for actuaries in building their skills with predictive analytics. Stay tuned for more information in 2017.

Our organization continues to develop and fund new research and thought leadership essays on predictive analytics and related work. The SOA recently released a new collection of papers³ covering:

- Adoption of machine learning techniques, which is a field of predictive analytics focused on ways to automatically learn from the data and improve with experience.
- A practical example of the intersection of insurance and machine learning with mortality prediction.
- How to compare policyholder efficiency in variable annuity lapses.
- The artificial neural network model and how to estimate the probability of new insurance purchases.

On LinkedIn,⁴ I have been sharing articles discussing interesting trends and developments involving our profession, including the applications of predictive analytics. I encourage you to take a look at some of those predictive analytics conversations, such as on climate change, the SOA 2017–2021 Strategic Plan and the curriculum changes for the associate pathway. The webpage SOA.org/predictive provides resources, case studies and new ideas from our members working with predictive analytics.

Please share your ideas with me, as I appreciate hearing your perspective. ■

References

¹ SOA.org/Leadership/Committees/Issues-Advisory-Council/cultivate-opp-team.aspx

² SOA.org/healthanalytics

³ SOA.org/News-and-Publications/Publications/Essays/default.aspx

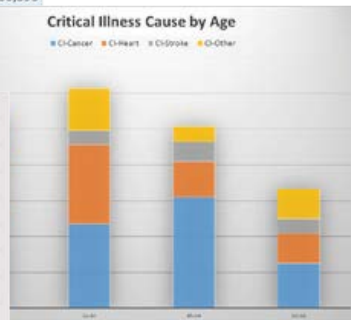
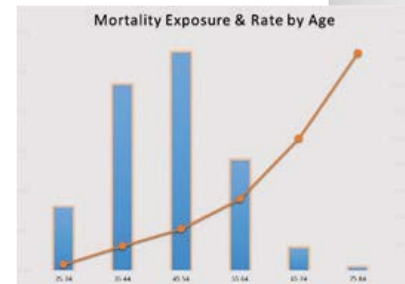
⁴ LinkedIn.com/company/craig-reynolds

INSIGHT ENTERPRISE ...EXPERIENCE STUDIES for Insurance



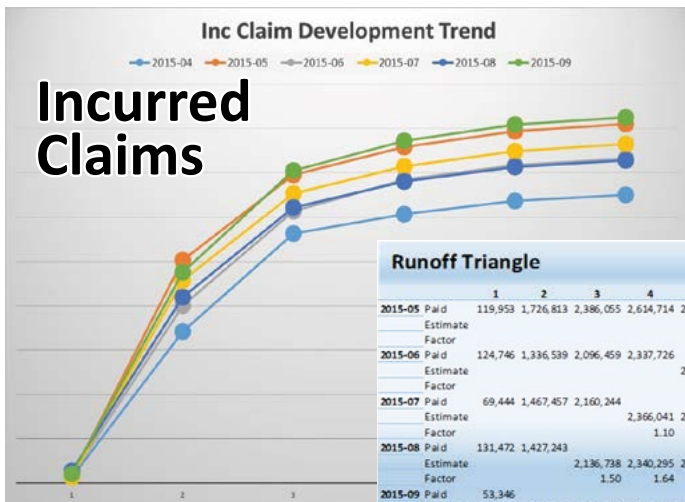
The Insight Enterprise suite includes dynamic, interactive studies as part of a flexible, modular analytical system built on data warehouse technologies. It can be implemented as an enterprise solution including operational reporting and financial management, or more locally as a stand-alone actuarial system. The system includes full set of audits; tracking data through the system, integrity, job execution and error reporting. Visit our website for more information, call us for a demo or email us at info@insightdecision.com

Mortality by Date					
	2013	2014	2015	Total	
			2015-Q1	2015-Q2	2015-Q3
Exposure	55,759	57,051	14,439	14,525	14,620
Actuals	281	332	57	78	
Expecteds	201	212	54	55	
A/E	140%	157%	105%	141%	



Insured Risk

Persistency by Issue Date							
	2011	2012	2013	2014	2015	2015 Total	
					2015-Q1	2015-Q2	2015-Q3
Y1	88.38%	88.19%	87.91%	88.14%	89.54%	91.61%	90.04%
Q1	96.96%	96.63%	96.16%	97.06%	96.68%	97.35%	97.41%
Q2	94.61%	94.47%	93.81%	94.96%	94.48%	95.97%	
Q3	91.91%	91.44%	91.18%	91.77%	92.16%		
Q4	88.35%						
Y2	77.79%						
Y3	70.90%						
Y4	65.72%						
Y5	60.67%						



8920 Woodbine Ave., Ste. 205
Markham ON, Canada L3R 9W9
416-479-0384

insightdecision.com

Looking east

A ROUNDUP OF NEWS FROM THE GLOBAL COMMUNITY

Whether you travel the world or never leave your home country, you are affected by global organizations, international requirements and the increasingly international nature of the actuarial profession itself. Here is some news from around the world.

THE 6TH SOA ASIA PACIFIC ANNUAL SYMPOSIUM

Under the theme “Future and Insights,” the Society of Actuaries (SOA) conducted its signature event in Asia, the 6th SOA Asia Pacific Annual Symposium, Aug. 29–30, in East Kowloon, Hong Kong.

The symposium intended to provide a learning and networking platform in the Asia Pacific region for SOA members and nonmembers, and covered issues in a wide range of areas in financial management and reporting, asset liability and investment strategies, insurance developments, enterprise risk management and professional competency skills.

Actuaries and professionals in finance, investment and other industries in Hong Kong and the Asia Pacific region attended the event. John Leung, the commissioner of the Office of the Commissioner of Insurance in Hong Kong, attended, and Billy Wong, the 2014 president of the Actuarial Society of Hong Kong, was a keynote speaker at the event.

PROFESSIONALISM IN PRACTICE

A select group of professionals in the Hong Kong and Asia Pacific region met Aug. 30, in Hong Kong, for the SOA 2016 Professionalism in Practice course.

The interactive event covered topics on issues encountered routinely in actuarial work environments and explored the professionalism practice, code of conduct and application of the actuarial profession. The group evaluated different business cases and participated in interactive discussions.

THE INAUGURAL SOA CHINA ANNUAL SYMPOSIUM

The Inaugural SOA China Annual Symposium took place Sept. 1–2, in the Chaoyang District of Beijing. This symposium was designed to provide a learning and networking platform in China for members and nonmembers to share

experiences about the actuarial profession and the finance and insurance industries.

The symposium focused on recent topics in a wide range of areas, from asset liability and investment strategies to health and pension insurance, enterprise risk management, and innovation and internet insurance.

This inaugural symposium intended to share best practices with participants and create an opportunity for the growth of the actuarial profession in China.

SOA NETWORKING MEMBER EVENTS

The SOA organized two networking events for members in Shenzhen and Shanghai on June 21 and June 22, respectively. The events were designed to provide a platform for SOA members to communicate, network and learn from each other.

During the Shenzhen event, Henry Yu, assistant general manager and chief actuary of AVIVA-COFCO Life Insurance Co., and Cathleen Yu, head of the Actuarial Department of ICBC-AXA Life, shared their impressions on the first China Association of Actuaries (CAA)/SOA executive education exchange program. The program brought chief actuaries and actuarial department heads from China to New York, Connecticut and Washington, D.C., for two weeks in April to meet with actuarial employers, organizations and educational institutions.

During a panel discussion at the Shanghai event about the executive training exchange program, Henry Yu and Cathleen Yu were joined by Xiujian Chen, chief actuary of China Pacific Life Insurance Co.; Yu Xiang, corporate actuary of Hannover Ruck SE Shanghai Branch; and Lynn Lin, chief actuary of AIA China.

Attendees were able to ask questions and participate in interactive discussions, and they enjoyed a light dinner and drinks.

INDUSTRY INSIGHT



DIVERSE CONTENT



LATEST SOLUTIONS



EXPERT KNOWLEDGE



SOCIETY OF
ACTUARIES

YOU'RE INVITED

THE MOST DYNAMIC ACTUARIAL
EVENT OF THE YEAR

2016 SOA Annual Meeting & Exhibit

Oct. 23-26, 2016

The Cosmopolitan of Las Vegas
Las Vegas, NV

Join us at The Cosmopolitan of
Las Vegas.

Comprised of nearly 200 sessions and networking events, the 2016 SOA Annual Meeting & Exhibit is poised to be one of the largest in history. Packed full of expert speakers, leading actuaries and world-renowned keynotes, this year's meeting will showcase the best the industry has to offer.

For more information visit SOA.org/AnnualMeeting.

SHOOTING FOR THE MOON

Here's your source for industry briefings and SOA news. Important headline information, section highlights and current stories—in short, news to note.



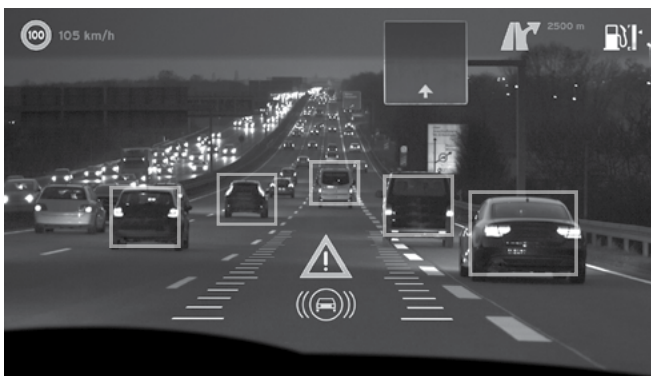
OUTER SPACE AND ROCKET INSURANCE?

Now that SpaceX has made rocket landings somewhat routine, the next step is to prepare the recovered rockets for reuse to launch commercial satellites. Some of the technical hurdles it must clear also have financial implications. Launch insurance rates have fallen. Insurers rate both the risk of launch vehicle failure as well as the chances that a satellite will fail, and combine the two to get a coverage rate.

RELATED LINKS

SpaceX Insurance Hurdles
bit.ly/InsuranceSpaceX

SpaceX Launches Two Satellites
bit.ly/SpaceXSatellites



U.K. EFFORTS ON DRIVERLESS CAR INSURANCE

Everyone from car manufacturers to government agencies and insurance companies has been claiming self-driving cars will be safer, and insurance companies will be happy to reduce their rates because claims will drop. So far that's been all talk, but now a British auto insurer has put its pounds on the table.

RELATED LINK

First Driverless Car Policy
bit.ly/DriverlessInsurance

OWNING A SMALL BUSINESS—MUST KNOWS

In its Editor's Choice for the Week article, *CFO.com* highlights five things to know about owning a small business—focusing on crowdfunding, cybersecurity, location, borrowing and avoiding culture clashes.

RELATED LINK

Five Things to Know
bit.ly/CFO5Things





INSURANCE TECH—IT'S ONLY THE BEGINNING

For those who follow technological innovation, it often can seem like certain areas of investor enthusiasm come out of nowhere—suddenly and with huge momentum. The wave analogy often is used, and not incorrectly—fevered investment propels increasing interest and drives new opportunistic entrepreneurs into a specific industry area, building until it inevitably crashes as certain companies underperform and interest moves elsewhere. There's been a lot of discussion that insurance tech is driving to the peak of a similar cycle.

RELATED LINK

Insurance Tech Hype
bit.ly/Insurance-Tech



THE ACTUARIAL FOUNDATION®

Preparing for tomorrow's possibilities® through education

TOP CORPORATE SPONSORS

VISIONARY



INNOVATOR



PIONEER





Your
bold
ambitions

+

Our
healthy insights

=

More
moments like this



Finding fresh ways to provide more people with greater security. Helping people to build for the future and enjoy longer, healthier lives. These are ambitions we share. At Swiss Re we believe that partnering with you will create innovative ways to manage health issues and improve the outcomes. That's why we want to share our expertise and insights from around the world to help you address your market needs. And that's why we truly relish those moments when we see results: those achievements, great and small, along the road to a healthier future for all. **We're smarter together.**

swissre.com



expand.

**A DISCUSSION OF
INSURANCE REGULATION
AROUND THE GLOBE**



evolve.

MODERATED BY ALBERT MOORE

In May of this year, the National Association of Insurance Commissioners (NAIC) International Insurance Forum was held in Washington, D.C. In a YouTube video promoting the event, NAIC President and Missouri Insurance Director John M. Huff states, “We all think about insurance on the local level, but more and more it’s becoming a global industry, and some of the decisions being made around the world can have real consequences for the jurisdictions we regulate.”¹

The role of the actuary is expanding with the globalization of the insurance industry. Therefore, there is a growing need for actuaries to understand the regulatory environment around the world. We have asked regulators and actuaries from across the globe to share insights on the regulatory environment and to opine on how ever-changing regulations impact the way actuaries must think and act.

Participants in this discussion are:

- **Larry Bruning, FSA, MAAA**, a life actuary at the National Association of Insurance Commissioners in Kansas City, Missouri. He can be reached at lbruning@naic.org.
- **Gaetano Geretto, FSA, CERA, FCIA**, president of Pelecanus Advisory in Toronto. He can be reached at gaetano.geretto@pelecanusadvisory.com.
- **Klaas Stijnen, NZSA, AAG**, managing director of Montoux’s global operations and based in New Zealand. He can be reached at klaas@montoux.com.
- **Ling Ling Wang, FSA, CERA, MAAA**, group deputy chief actuary at Ping An Insurance (Group) of China in Shenzhen, China. She can be reached at WANGLINGLING293@pingan.com.cn.

Q:

What is the general regulatory framework in the country(ies) with which you are most familiar? If you are familiar with more than one national regulatory framework, can you address the high-level contrasts?



GERETTO:

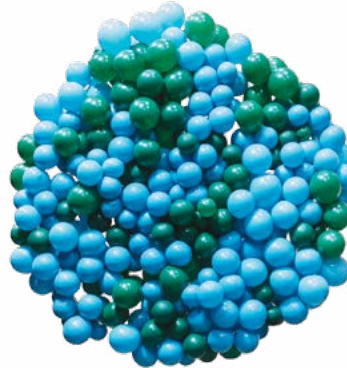
I am most familiar with the Canadian insurance regulatory environment, as I worked for the Canadian federal financial services regulator, the Office of the Superintendent of Financial Institutions (OSFI), for six years. OSFI's principal mandate is as an integrated regulator (banking and insurance) on prudential matters, i.e., solvency issues. Canadian market conduct issues are addressed by Canadian provincial regulators.

From my international regulatory work on Canada's behalf at the International Association of Insurance Supervisors (IAIS), I also am familiar with the proposed International Capital Standards (ICS) being considered by the IAIS for internationally active insurance groups (IAIGs).

Equally, I am familiar with the Solvency II regime governed by the European Insurance and Occupational Pensions Authority (EIOPA). From my time in industry, I also am familiar with the U.S. Statutory Accounting and Generally Accepted Accounting Principles (GAAP) regimes, IFRS 4 Phase II proposed by the International Accounting Standards Board (IASB), and the regimes in offshore locales.

The contrasts, which are pronounced when comparing regulatory regimes, are the degrees of latitude from which the actuary has to choose assumptions and criteria for liabilities valuation, according to guidelines in actuarial standards. Equally, the relationship between the value of liabilities and the value of risk-based capital can differ among different insurance regulatory jurisdictions.

Finally, although stress and scenario testing exists for insurers, particular jurisdictions publish the scenarios created by the regulators and disclose which insurers passed or failed the test (e.g., the European Union). In Canada, these stress and scenario testing exercises are not disclosed to the public. Similarly, in Canada, the results of these exercises and the names of insurers that fail the test are not disclosed publicly.



BRUNING:

In the United States, the general regulatory framework for the regulation of insurance is done at the individual state level. Insurance laws are promulgated by the state legislatures, as are the powers given to the insurance regulatory official, the insurance commissioner. Typically, the insurance commissioner is given the power to promulgate insurance regulations that are necessary to apply or execute the law. In the United States, the insurance commissioner is appointed by the governor in all but 11 states and the U.S. Virgin Islands. In those 12 jurisdictions, the voting public elects the insurance commissioner.

Typically, insurance laws may be divided into two categories, namely laws dealing with the markets and market conduct, and laws dealing with solvency, such as reserving laws and risk-based capital requirements. Laws dealing with markets and market conduct include laws requiring certain contract provisions that must be included in an insurance contract, whether insurance products and insurance premiums need to be approved by the insurance commissioner prior to being sold, and requirements on licensing of insurance agents who sell insurance products to consumers. Laws may be separate or specific to particular markets or lines of business, such as property/casualty, health, retirement/pensions/annuities and life insurance.





STIJNEN:

Having worked on different continents, I am familiar with a few regulatory frameworks. Currently, I am most familiar with the New Zealand regulatory prudential supervision framework. I am also familiar, but to a lesser extent, with the Australian and Solvency II frameworks.

For this interview, I will focus mostly on the New Zealand life insurance solvency framework. The Reserve Bank of New Zealand promotes the maintenance of a sound and efficient financial system. In that role, it supervises the banking and insurance sectors, licenses insurance companies, and provides and updates from time to time a prudential supervision framework.

This framework, in summary, contains two standards: the fit and proper standard and the solvency standard. The former sets out the requirements for a fit and proper policy for directors and relevant officers (which includes appointed actuaries), and the latter sets out the rules and guidelines for calculating the required capital an insurer must hold.

In terms of differences among frameworks, New Zealand has relatively simple solvency requirements that are driven by the relatively simple nature of the life insurance business sold. The other key aspect, from a slightly different angle, is the consultative approach the regulator takes to developing prudential regulations for New Zealand.



WANG:

The insurance industry in China is governed by two levels of regulations: a basic insurance law established by the National People’s Congress, and various insurance regulations issued by the insurance supervisory authority, China Insurance Regulation Commission (CIRC).

The CIRC reports to and carries out administrative functions delegated by the State Council, with the following responsibilities:

- Formulate strategy for the development of the insurance industry.
- Establish insurance laws and regulations.
- Issue licenses to insurance institutions and approve senior management appointments of such organizations.
- Approve mergers, acquisitions and share purchases.
- Supervise solvency; oversee bankruptcies and liquidations; manage policyholder protection fund.
- Approve new products, policy forms and premium rates.
- Oversee market conduct and issue penalties for irregularities.

The CIRC regulations focus on three areas: corporate governance, solvency and market conduct supervisions. Supervisory tools used are:

- ① | Corporate internal control requirements
- ② | Solvency requirements, investment regulations
- ③ | On-site inspections, use of policyholder protection fund

The newly established solvency requirement (C-ROSS) also includes a three-pillar approach similar to EU Solvency II, with the following distinctive features to reflect the emerging market characteristics of China:

- Use accounting value for asset valuation to ease the management understanding (with only one set of asset value).
- Smooth out risk-free yield curve in liability discounting to reflect the incomplete, less perfect and inefficient financial market.
- Use a relatively simple standard formula approach with more factor-based capital calculations to ease the implementation burden due to lacking resources and expertise in the market.
- Use a more qualitative risk assessment to assess nonquantifiable risks to allow for the rapidly changing nature of the business.
- Use the result of the second pillar (risk assessment) to modify the first pillar numerical result to enforce better risk management practices in the industry.



How have you seen the insurance regulatory environment evolve?

BRUNING:

As insurance products have become more complex in recent years, the complexity has led to increased regulatory activity centered around the appropriate measurement and assessment of new or additional risks posed by the complex product features. Recent examples include variable annuities with guaranteed death and living benefits, guaranteed lifetime income benefits attached to fixed and indexed annuities, and long-term care benefits added to life insurance policies. This has led state insurance regulators to replace the existing formula-based valuation methodology with a principle-based valuation methodology for life insurance on a prospective basis. In addition, the financial crisis of 2008 led Congress to pass federal legislation that establishes additional regulation and capital requirements for insurance companies designated as systemically important financial institutions (SIFIs). Likewise, for U.S. insurance companies that write insurance business in multiple countries and are designated as globally systemic important institutions (G-SIIs), additional regulatory requirements, including additional capital standards, will apply.

GERETTO:

The insurance regulatory regimes have been evolving and have been influenced by changes in the banking regulatory regimes (Basel II and Basel III). As a consequence, certain regulatory regimes are using a best-estimate approach for the valuation of insurance liabilities, with minimal provisions for adverse deviations (PfADs). The risk-based capital regimes in these jurisdictions attempt to make more provisions for adverse deviations, generally using stochastic modeling.

Today's Canadian regime still allows the actuary discretion to use PfADs in reserve calculations according to actuarial standards promulgated by the Canadian Institute of Actuaries and the Canadian Actuarial Standards Board.

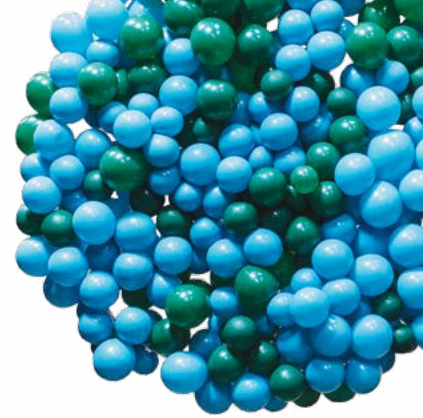
OSFI Canada has proposed to alter its current Minimum Continuing Capital and Surplus Requirements (MCCSR) for Canada's risk-based capital regime, which is to be updated and replaced by a new regime called Life Insurance Capital Adequacy Test (LICAT) in 2019.

STIJNEN:

When I arrived in New Zealand in 2009, after working in Europe and Asia for almost a decade, I was surprised there was virtually no solvency regime in place and the regulator had just initiated the process of putting one in place. To my knowledge, it was probably the last Western country to adopt one. I wondered why, especially given that the New Zealand regulator had been quite progressive with implementing banking supervision regulations. This situation might have been due partly to the progressive attitude of the New Zealand Society of Actuaries, which had recognized the lack of a solvency regime and the risk to the industry and the profession. Long before the regulator had started developing the prudential supervision regulation, the society had developed and issued a Professional Solvency Standard for life and nonlife insurance. This was successful, and most companies over time started reporting their solvency margin in their financial statements based on this standard.

Since 2009, the act and associated standards have evolved rapidly from concept to implementation and are now fairly mature. The supervision regime was put to the test when the Canterbury Earthquakes hit New Zealand between 2010 and 2013, following the introduction of the act and standards in 2010.

The regulator has been very consultative with the industry in developing the act and standards. It actively seeks and discusses feedback from the industry. New Zealand is a small market, which makes such consultation processes more practical. This active consultation approach to developing prudential supervision, in combination with the presence of the actuarial Professional Solvency Standard and the Australian solvency framework, resulted in a smooth transition period for the act and standards in 2010, and the subsequent licensing process. The Australian industry is fairly similar to the New Zealand insurance industry (particularly from the perspective of designing the prudential supervision), and many of the insurers in New Zealand are Australian owned. In addition, the Australian insurance companies performed well during the global financial crisis.



WANG:

The insurance market in China grew rapidly over the course of the past few years, and now it is the third-largest insurance market in the world. Its growth was supported by the State Council's issuance of "Ten Opinions" (also known as the "Ten New National Opinions") in 2014, which was intended to accelerate the development of the insurance industry. The mid- to long-term outlook of the market is very optimistic, with a projected premium growth rate of 15 percent on average.

To be able to better serve the market, the CIRC proactively is adopting new regulations to encourage competition, growth and wider social and economic developments. In turn, this reshaping of the regulations has brought them closer to the international standard and toward more liberalized, market-driven and transparent supervision.

The CIRC currently is advocating a reform strategy of "open front end, control back end." Several significant milestones have been achieved. For example, the official launch of C-ROSS on Jan. 1, 2016, and the liberalization of pricings for life insurance products and nonlife motor insurance products in 2015, allow for more investment choices for insurance funds.

The CIRC also is trying to expand the insurance product offerings to supplement the national social and economic developments. Tax advantage health insurance was piloted in 2015. There also are plans to apply more tax advantage incentives to other health and pension insurance products. The first regulation on internet insurance was issued in 2015. The first catastrophe insurance regulation (on earthquake insurance) was issued in May 2016 to encourage natural catastrophe coverage.

The systemic risk regulation has been on CIRC's top list since Ping An was selected as one of the G-SIIs in 2013. Globally, the CIRC is actively involved in the development of G-SII related regulations drafted by IAIS. Domestically, the consultation paper of domestic systemically important insurer (D-SII) policy measures was issued in April 2016, with the D-SII assessment methodologies consultation planned for the near future.

More widely, the reformation of the whole financial supervisory structure is on the way. China currently has three separate regulatory authorities for financial sectors: China Banking Regulatory Commission (CBRC) for banking, CIRC for insurance and China Securities Regulatory Commission (CSRC) for securities. Following the financial regulation reforms in the United States and the United Kingdom, there are voices calling for a more integrated framework. The State Council of China is considering reform options to consolidate or enhance coordination among these three regulatory bodies, especially on the macroprudential front.



Solvency and capital adequacy are concerns for regulators. How are current regulatory approaches addressing these issues?

BRUNING:

As previously stated, current regulatory approaches are not well suited to address the complexity that is evolving in new product development. To address this issue, regulators in the United States are moving to a principle-based valuation methodology for both reserves and capital that will be applied on a prospective basis.

GERETTO:

Current regulatory approaches go further than the calculation of reserves and risk-based capital. All advanced regulatory regimes (United States, Canada, United Kingdom, European Union, Australia, Bermuda) have a requirement for insurers to conduct, discuss with the boards of directors and, ultimately, file with their regulator an Own Risk and Solvency Assessment (ORSA).

The ORSA is a process by which management calculates its required solvency capital and compares it against its risk profile. In addition, in certain regulatory jurisdictions where required, an insurer also is expected to calculate its own economic capital calculation in line with its assumptions regarding its risks and financial strength.

Additionally, in many jurisdictions, there is a significant process and expectation for stress and scenario testing to be used to assess the financial strength of an insurer's balance sheet. Requirements exist in particular jurisdictions for the actuary to opine on the financial strength of the insurer in question through examining various insurance risks and macroeconomic scenarios (e.g., Canada, United States, European Union).

So, more emphasis is being placed on dynamic approaches to assess the solvency of insurers in

all jurisdictions. In Canada, according to statute, the appointed actuary has a fiduciary responsibility to OSFI to ascertain the financial strength of the insurer through the Dynamic Capital Adequacy Test (DCAT) report.

STIJNEN:

Overall, I view the approach of the New Zealand regulator as fairly pragmatic, given the type of life insurance products sold and relatively high degree of Australian ownership.

The vast majority of life insurance sold is yearly, renewable risk business. There is some legacy par business. The solvency approach the regulator has adopted, given this type of life insurance business, is discreet and rule based (as opposed to stochastic and principle based), and doesn't explicitly attempt to value options and guarantees. This seems to work well for the risk business and is relatively cost efficient.

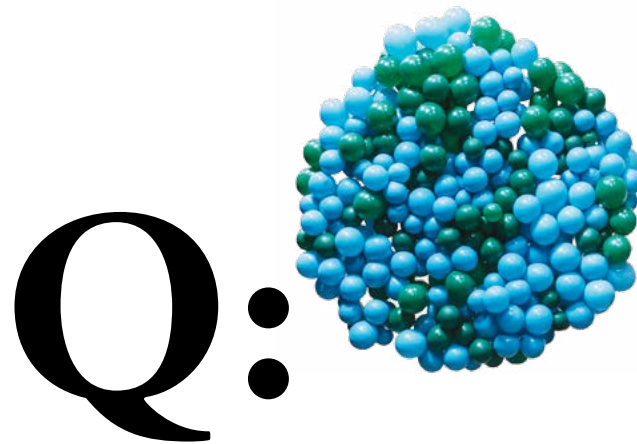
However, now that interest rates in New Zealand also are dropping to historically low levels, par business guarantees are close to being in the money. The framework, in my opinion, does not deal with this situation well compared to Solvency II, for example.

WANG:

The development and implementation of C-ROSS is a significant achievement in the insurance regulatory history in China.

CIRC launched the C-ROSS project in 2012 with combined efforts from the regulator, consulting firms and insurance industry (including Ping An as one of the project members). The first version of the technical standard was released in February 2015 to start a transition period. The C-ROSS officially was implemented on Jan. 1, 2016. The top-level design of C-ROSS is consistent with the IAIS requirement specified in Insurance Core Principles. Its three-pillar structure is similar to European Solvency II and the Basel system. But the contents under the three pillars brought in many elements of localization, reflecting China's emerging market characteristics.

The new risk-based C-ROSS addressed many of the concerns with the old Solvency I system. It provided better supervisory tools for the growing complexity of risks faced by the insurance industry. It supported a regulatory reform strategy that enabled the regulator to "control back end" (solvency and risk management evaluation). It offered a safety net for CIRC to relax "front-end control," with more freedom for industry to concentrate on market competition. The C-ROSS enhanced the insurance supervision in China, making it more consistent and comparable to other international frameworks.



Please provide insight into regulatory concerns that are likely to impact the roles of actuaries.

BRUNING:

Certainly the implementation of a principle-based valuation method will have a big impact on the actuarial profession. To carry out a principle-based valuation will, in most cases, require use of financial models run over many economic scenarios to determine the appropriate level of reserves and capital. The principle-based approach to valuation will allow a company to use its own experience data to the extent it is credible, which will place more burden on actuaries to conduct frequent experience studies. A recent regulatory concern has been the extended period of very low interest rates and the impact it is having on the insurance industry. Regulators are concerned whether insurance companies will be able to earn rates of interest on their asset portfolios that are able to fund the minimum guaranteed rates of interest on their liability portfolios.

GERETTO:

From a regulatory perspective, the emphasis on solvency is a key concern. Actuaries can better anticipate these concerns by ensuring their own scenario and stress testing is based on tail events, which may not be immediately considered to be plausible, but probable.

Those insurers that considered the possibility of a systemic event that would see equity markets drop 35 percent had created sufficient surplus on their balance sheets to withstand the most extreme events in the most recent global financial crisis.

STIJNEN:

The key regulatory solvency concern for actuaries in New Zealand and the regulator, in my view, is in relation to declining interest rates and the par business guarantees. Although all par business is closed book, the assets under management and annual premium income are still significant enough to be a threat to life insurance companies with large par books.

In addition, three mostly Australian life industry trends that will have or are having an impact on solvency and capital are:

- ➔ Worsening claims experience—especially for critical illness products.
- ➔ Loss-making disability income products.
- ➔ Change in ownership—bank assurers selling (parts of) their life insurance business and superfunds stepping into life insurance.

The first two will have an impact on assumptions and loss recognition rules. The latter can impact the regulatory reporting and compliance for actuaries in these businesses.

WANG:

Two significant regulatory events are the implementation of C-ROSS and the liberalization of pricing. It's a big challenge, within a short time frame, for actuaries to upgrade all of the system/analysis/process/work to incorporate these changes. I would name these two events the top regulatory concerns for the actuaries in China today.

The solvency plus liberalization of pricing have positioned actuaries to assume bigger and wider roles, even for traditional functions, such as product development, pricing, financial projection, risk management and capital management. These actuarial works require more dynamic analysis and incorporate knowledge ranging from risk management to business environment. We have seen insurers quickly expand and strengthen their actuarial functions under these new rules. This in turns creates lots of job opportunities for actuaries.

CONCLUDING COMMENTS FROM ALBERT MOORE

Thank you for providing your perspectives. There are many interesting areas for thought and lessons learned. Regulatory risk is an opportunity for actuaries to understand the constantly changing regulatory environment. Actuaries in New Zealand demonstrate the value of proactively contributing to the insurance regulation regimes and continuous consultation on emerging topics. Actuaries in China respond to a three-pillar supervisory structure designed to ensure solvency, capital adequacy and consumer protections. Actuaries in Canada continue to address regulation that requires less prescription and more principles-based approaches for regulation. In the United States, there is an evolution from a primarily prescribed approach toward greater principles-based analysis. All are being challenged to understand how our fiduciary responsibility extends further than the benefit of company shareholders and management to include the public interest. ■

Albert J. Moore, ASA, MAAA, is second vice president, Actuarial Systems, at Ohio National Financial Services in Cincinnati.

albert_moore@ohionational.com

Reference

¹ [YouTube.com/watch?v=s-9xe1ikAOE](https://www.youtube.com/watch?v=s-9xe1ikAOE)



To read “Expand. Evolve.” in its entirety, please visit **theactuary magazine.org**. Panel participants continue their discussion on insurance regulation around the globe, focusing on:

- ➔ The impact that regulatory issues have on globalization.
- ➔ What insurance companies and actuaries should know about regulation.
- ➔ How the changes in regulatory requirements may challenge actuaries.



HARNESSING

CHANGE

INTRODUCING THE SOA'S NEW WEB-BASED REGULATORY RESOURCE

BY JOE WURZBURGER

The Society of Actuaries (SOA) is proud to announce a new web-based resource that will offer members an easy way to search for recently-released regulatory changes. The resource will launch with regulatory updates for U.S. actuaries practicing in health and life. Check it out at [SOA.org/regulatoryresource](https://www.soa.org/regulatoryresource).

The resource was developed in response to consistent input over several years from members about the difficulty of responding to regulatory change. The SOA Board of Directors asked a task force, led by Jennifer Gillespie, FSA, MAAA, and Bill Sayre, FSA, MAAA, to investigate whether there was an opportunity for the SOA to provide assistance to members in dealing with regulatory change

NEW REGES

that did not significantly duplicate or supplant work done by consulting firms or other actuarial or industry organizations. The task force discovered that while it was easy to get email alerts announcing breaking regulatory changes, it was much harder to find out what new regulations were released a few weeks ago. The task force suggested that a web-based resource with a curated list of recent regulatory changes by practice area would fill a missing gap.

DEVELOPING THE RESOURCE

With this solution came many questions:

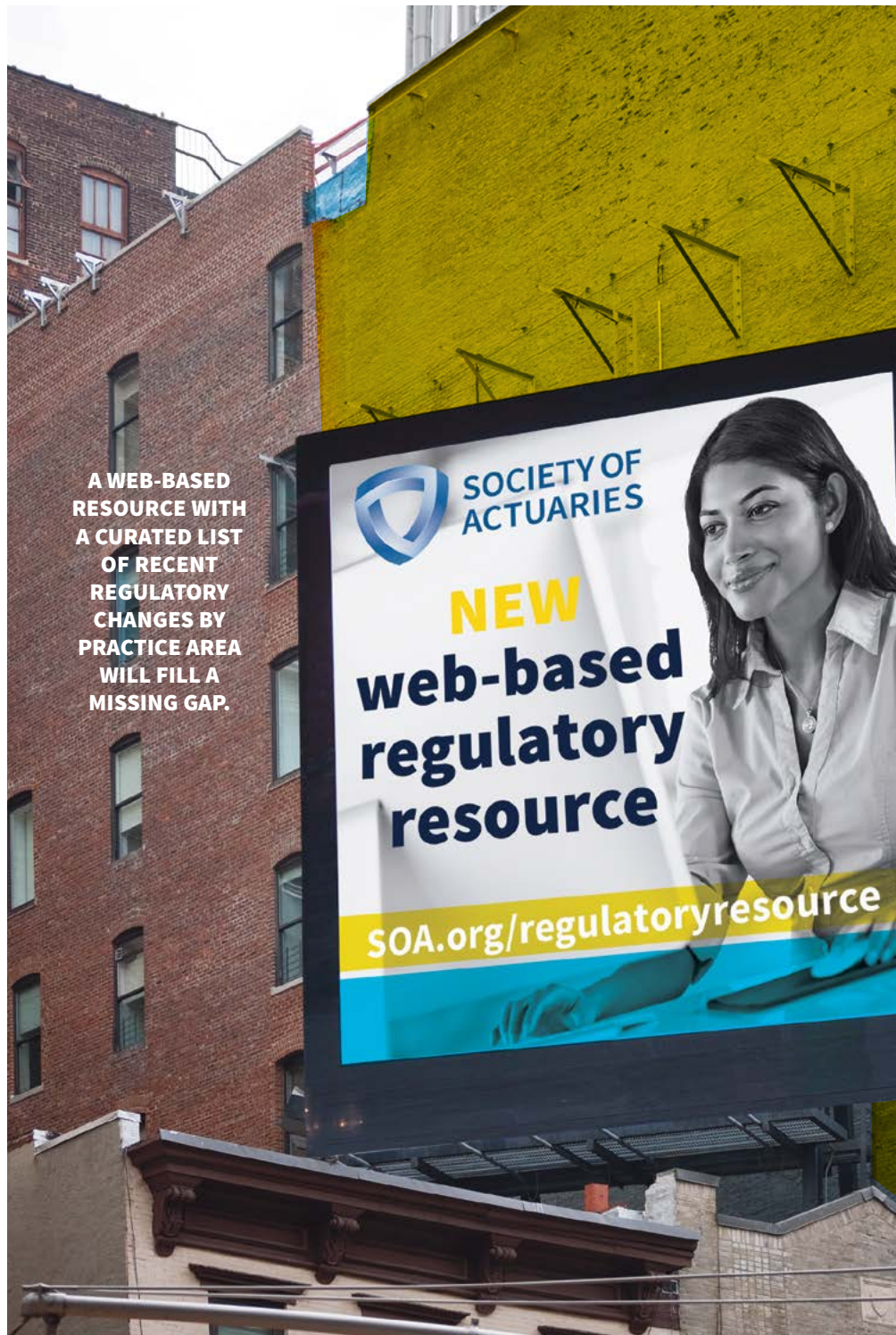
- ➔ **Who will create and maintain this resource?** It was determined that the best source of subject-matter expertise for this project would come from the SOA's sections. Seven sections answered the call: Financial Reporting, Health, Long-Term Care Insurance, Marketing and Distribution, Product Development, Smaller Insurance Company and Taxation.
- ➔ **How will this resource be organized?** While the input will come from sections, it was determined that the best way to organize the content is not by section, but rather by practice area. It also will eventually be organized by country; the initial version is for the United States, but future iterations will include other countries. The first two practice areas represented are health and life (which was expanded to include life & annuity).
- ➔ **How many links should there be?** While no firm limit was determined, the intent is for this resource to be a curated list, not an exhaustive one. The focus will be on more recent and significant changes.
- ➔ **What types of sources will be linked?** The focus will be on primary sources (e.g., the National Association of Insurance Commissioners (NAIC), International Association of Insurance Supervisors (IAIS) or Medicare), with a limited number of non-commercial secondary sources to be considered. Content primarily will be for national regulation rather than at the individual state level.

➔ **Will this resource provide guidance or interpretation?** NO! This is a very important point to make clear. This resource is designed to be the first place an actuary would look regarding regulation, but not the last. That is to say that an actuary would need to do further research in order to get guidance or interpretation. This resource will only point him or her to the original piece of regulation.

KEEPING INFORMATION CURRENT

One risk when creating a web-based resource such as this is that the content could become stale. Many people feel a natural level of excitement when asked to create, but that excitement can fade quickly when asked to maintain. Three keys were identified to address this dilemma:

- 1 | **Carefully recruited practice area teams:** As discussed earlier, the resource is organized by practice area. Therefore, volunteers from sections would need to be organized into practice area teams. By carefully recruiting these teams and entrusting strong leaders for each one, we feel we can minimize the risk of stale content. Tony Litterer, FSA, MAAA, and Josh Hammerquist, ASA, MAAA, have been capable leaders for the life and annuity and health practice area teams, respectively. Without their strong leadership, it is hard to imagine seeing such fast and effective progress in rolling out this resource to our members.
- 2 | **Monthly reviews:** The site will be reviewed by each practice area team *at least* monthly. The practice area teams know that this is a requirement, and that failure to do so will result in the resource being taken down. There may not



be extensive updates each month, as in some months there may not be much change needed. But users may rest assured that whatever they are looking at in the SOA Regulatory Resource has been reviewed for relevance within the past month. Users will be able to

know when it was last reviewed by looking at the “last reviewed” date on the top of the webpage.

- 3 | **Dedicated resource:** Timeliness is everything in dealing with regulatory change. The SOA quickly realized that existing staff and volunteer resources were not



sufficient; to be able to respond in a timely manner, we contracted with attorney Scott Cipinko to ensure the web resource would meet members' needs. Scott has extensive experience tracking legislative and regulatory change in the insurance industry. His skill set and

past experiences were a perfect fit for this project, and he has jumped into it with both feet. Without Scott's tireless energy and collaborative nature, we would have had many months still to go before we could have launched this member resource.

WHAT'S NEXT?

Now that the first two practice area resources have rolled out, we intend to evaluate them continuously. We will track metrics to see how they are being used, and we will respond to feedback we receive from users. The ultimate goal is to provide a valuable resource to our members. It needs to be relevant and user-friendly. Our ability to respond nimbly to metrics and feedback will go a long way toward helping us achieve that goal.

We also intend to expand the offerings beyond the initial two practice areas. A long-term care (LTC) practice area team is already hard at work creating an LTC resource under the leadership of Bob Yee, FSA, MAAA. The possibility exists for other practice areas to be added to the mix as well, not to mention expanding to include geographies outside of the United States.

Perhaps most important, we want to hear from you! Recall that the genesis of this entire project was feedback from you. Now it's your opportunity to help shape it. Let us know what you like about this resource, as well as where it is lacking. What type of information is missing? What would make it more user-friendly? Would you like to volunteer to help as it expands into additional practice areas or geographies?

So, if you haven't already, please spend some time getting familiar with the SOA's Regulatory Resource. You can find it at [SOA.org/regulatory resource](https://www.soa.org/regulatory-resource). We'd love to hear what you think. ■

Joe Wurzbarger, FSA, MAAA, is a staff fellow, Health, at the Society of Actuaries.

jwurzbarger@soa.org



FEATURE
FIDUCIARY CONFLICT RULE



PREPARE FOR LANDING

WHAT ACTUARIES AND EMPLOYERS NEED TO KNOW ABOUT THE NEW FIDUCIARY CONFLICT RULE BEFORE IT BECOMES APPLICABLE NEXT SPRING

BY JASON M. LEVY

In April 2016, the U.S. Department of Labor (DOL) released the final version of the so-called fiduciary conflict rule. More than six years in the making, this rule represents perhaps the most significant regulation from the DOL during the Obama administration.

The fiduciary conflict rule expands the definition of fiduciary to cover, with certain exceptions, all investment advice provided to a retirement plan (like a 401(k) plan, defined benefit pension plan or an IRA), or to a retirement plan participant or beneficiary. It imposes fiduciary status on a broad category of professionals, including many broker-dealers who previously had taken the position that they were not investment advice fiduciaries based on a regulation that had been in place since 1975.

The new regulation has an international reach—foreign advisers, whether recommending investments in U.S. or foreign assets, will be subject to the fiduciary rule if the recommendation is made regarding assets of a U.S. retirement “plan” (as defined in the regulation to include the types of plans listed previously).

In contrast to the sweeping changes it imposes on investment advice professionals, the fiduciary conflict rule will have a far more modest effect on actuaries, and the employers and plan administrators for whom they work. Unlike its impact on broker-dealers and other investment professionals, the rule generally will not confer investment fiduciary status on actuaries or employers. Nevertheless, the rule has important implications for actuaries and employers that sponsor retirement plans:

- Actuaries who provide nontraditional services, such as advising on group annuity purchases, risk falling within the rule’s definition of fiduciary.
- By regulating the distribution of benefits from employer-sponsored retirement plans, the fiduciary conflict rule may have the practical effect of slowing the outflow of assets from those plans and thereby increasing the amount of assets they otherwise hold.
- Employers and plan administrators may need to create new procedures to monitor their service providers’ compliance with the fiduciary conflict rule.

ARCHITECTURE OF THE FIDUCIARY CONFLICT RULE

The fiduciary conflict rule applies a broad, functional test to define fiduciary investment advice as it relates to a retirement plan or investor. Specifically, a person takes on fiduciary status with respect to a retirement plan or investor if he or she:

- 1 | provides one of the following types of advice for a fee or other compensation:

- recommendations regarding acquiring, holding, disposing of, or exchanging securities or investment property of a retirement plan;
- recommendations regarding how securities or investment property should be invested after the assets are distributed from the retirement plan; or
- recommendations regarding investment management, such as recommendations on investment policies, strategies or portfolio composition; on selection of other persons to provide investment services or of investment account arrangements; or with respect to rollovers, distributions or transfers from a retirement plan.

- 2 | *also* meets one of the following conditions:

- represents that he or she is acting as a fiduciary;
- provides advice pursuant to an agreement, arrangement or understanding that the advice is based on the particular needs of the advice recipient; or
- directs the advice to a specific recipient.

The rule also specifies certain situations in which a person will not be treated as an investment advice fiduciary, regardless of whether the person might otherwise meet the rule’s definition. These include investment education, communications to a general audience, marketing of a platform of investment options, certain communications by employees of a plan sponsor and, generally, communications by counterparties in negotiations with fiduciaries of large plans.

If a person is an investment advice fiduciary under the new definition (and is not otherwise excluded), his or her investment advice will be subject to the “prohibited transaction” rules. Absent a “prohibited transaction exemption,” these rules prohibit receipt of commissions or any other compensation that varies based on the nature of the investment advice.

BEST INTEREST CONTRACT EXEMPTION

In conjunction with the fiduciary conflict rule, the DOL issued a “Best Interest Contract” prohibited transaction exemption that would allow advisers to retain such variable compensation. The Best Interest Contract exemption generally requires:

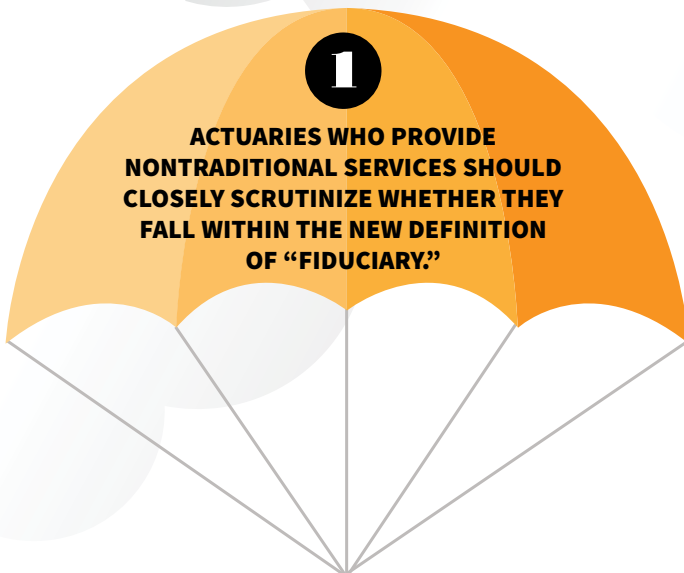
- 1 | Acknowledgment of fiduciary status.
- 2 | Adherence to an “Impartial Conduct Standard” that requires the adviser to provide advice that is in the investor’s best interest, avoid misleading statements and charge no more than reasonable compensation.
- 3 | The financial institution employing the adviser to implement policies and procedures designed to prevent violations of the Impartial Conduct Standard.

FEATURE FIDUCIARY CONFLICT RULE

- 4 | Disclosures concerning fees and potential conflicts of interest.

The first and second of these requirements are of particular significance for IRA owners. Unlike participants in most employer-sponsored retirement plans, IRA owners do not have a statutory right to bring suit against fiduciaries under the Employee Retirement Income Security Act (ERISA). Thus, the Best Interest Contract exemption, if used, would provide IRA owners with a direct contractual right—not available under any statute—to seek a remedy for certain breaches that violate prohibited transaction rules or the adviser’s obligations as a fiduciary.

KEY TAKEAWAYS FOR ACTUARIES AND EMPLOYERS



In nonbinding commentary published in connection with the fiduciary conflict rule, the DOL stated it is not its intent for actuaries to become investment fiduciaries “merely because they provide professional assistance in connection with a particular investment transaction.” Rather, the DOL would view actuaries as being subject to the fiduciary definition only if they “act outside their normal roles.”

Accordingly, as actuaries’ activities shift to less traditional roles, it is important for actuaries to be mindful of the expanded definition of an investment advice “fiduciary.” For example, actuaries who recommend or advise on the selection of a particular insurer to provide a group annuity contract in the context of a de-risking transaction or a defined benefit plan termination may risk being subject to the rule. Likewise, actuaries providing comprehensive services for smaller plans, such as providing recommendations

concerning the composition of a pension plan portfolio, also may be covered.

Actuaries who are investment advice fiduciaries must adhere to ERISA’s fiduciary standard, which requires recommendations to be prudent and to be made with undivided loyalty to the plan and its participants. They also must not engage in nonexempt prohibited transactions. Violations of ERISA fiduciary duties or the prohibited transaction rules may subject the actuary to personal liability for the breach. Additionally, excise taxes may be imposed for violations of the prohibited transaction rules.

Ultimately, whether advice from nontraditional actuaries falls within the fiduciary definition depends on individualized facts and circumstances. Actuaries acting in nontraditional roles should consider seeking legal counsel to determine whether their communications with plans or plan participants are subject to the fiduciary standard and, if so, about how best to manage fiduciary obligations and prohibited transaction considerations.



In one of the most significant departures from previous DOL guidance, recommendations on distributions, including rollovers into an IRA or transfers to another plan, can constitute fiduciary investment advice under the new rule.

An adviser must use the Best Interest Contract exemption (or another prohibited transaction exemption, if available) if he or she is to receive any direct or indirect compensation as a result of the distribution. The Best Interest Contract exemption likely requires, in this context, that the adviser acknowledge fiduciary status and document

his or her reasons for why it is in the participant's best interest to take a distribution from the plan rather than leaving the assets in the plan.

Some financial advisers and institutions may view the compliance costs and legal risks associated with the Best Interest Contract exemption as being too great—and cease advising participants regarding plan distributions. Others may find it difficult to document that a distribution is in their client's best interest, particularly in the context of a distribution from a large employer 401(k) plan that permits participants to invest in preferential “institutional” share classes (or similarly advantageous investment options) to an IRA or other individual investment account that charges higher “retail” fees.

In either case, the practical result may be that fewer participants will take distributions from their employer-sponsored retirement plans. If that occurs, employer-sponsored plan assets will grow over time, as money is retained in the plans for longer durations.

With larger than projected assets, employer-sponsored 401(k)-type plans may have increased bargaining power to negotiate more favorable investment options and other terms for their participants. If these negotiations are successful, the employer may find itself in a virtuous cycle in which the employer-sponsored plan becomes a more attractive option for participants' retirement assets, thereby providing the plan with more leverage to negotiate even better investment options.



The fiduciary conflict rule and the DOL's related commentary provide several assurances that employer plan sponsors and their employees will not be investment advice fiduciaries under the rule, absent unusual circumstances.

For example, the rule contains a broad exclusion for nearly all communications between co-workers, including HR employees. Additionally, the DOL has clarified that because ordinarily neither the employer nor the employee receives fees or other compensation in connection with providing advice, any “investment advice” from an employer or employee likely would not be subject to the fiduciary definition because the advice was not provided for the required “fee or other compensation.”

Even if they are not investment advice fiduciaries under the new rule, plan sponsors and administrators have other fiduciary obligations. They maintain a separate—and preexisting—fiduciary duty to monitor their service providers. The fiduciary conflict rule will affect this obligation, particularly with respect to service providers that take measures to remain outside the scope of the rule. For example, employers and administrators must monitor service providers that intend to provide nonfiduciary “investment education” advice. Such education commonly takes the form of asset allocation models and interactive investment materials designed to assist participants in 401(k)-type plans in selecting investment options. The DOL has emphasized that employers and administrators will need to evaluate and periodically monitor these materials to ensure they are “unbiased and not designed to influence investment decisions toward particular investments” that may result in higher compensation for the service provider.

CONCLUSION

The fiduciary conflict rule will not be applicable until April 10, 2017. While this transitional time primarily is in place to allow broker-dealers and other investment professionals to adjust from nonfiduciary to fiduciary status, the delayed applicability date also should benefit actuaries and employers. Particularly, in light of additional guidance from the DOL expected to be announced in the coming weeks and months, actuaries and employers should monitor developments in the fiduciary conflict rule and closely analyze how the rule will impact their operations. ■

Jason M. Levy is an attorney with Covington & Burling LLP. He advises companies on all aspects of employee benefits and executive compensation, including compliance with the Internal Revenue Code and the Employee Retirement Income Security Act.

jmlevy@cov.com

The information presented is not legal advice and is not to be acted on as such. Please contact your legal counsel to obtain advice on your particular issue or question.



ASA: RE

ANNOUNCING EXCITING CHANGES TO THE ASA PATHWAY

BY JEREMY J. BROWN

The Society of Actuaries (SOA) Board of Directors adopted several education initiatives in 2015. One was a complete review of the Associate of the Society of Actuaries (ASA) curriculum. As a result of this review, the Board approved a new ASA curriculum, which will take effect in mid-2018.

The definition of ASA has changed over time, but the current definition has been in place since the 1990s. With the 2000 redesign, the ASA has three components:

- ① | Mathematical framework
- ② | Introduction to all practice areas
- ③ | Professionalism and standards of practice

The task force that recommended the new curriculum was asked to consider:

- What are considered fundamental knowledge and skills?
- What do all actuaries need to know, now and in the future?
- What is the proper balance between finance, investments, economics, statistics, predictive analytics, short-term insurance and long-term insurance?

The task force drafted a proposed curriculum and solicited input and comments from members, candidates, employers, academics, volunteers, section councils and several key actuarial organizations. In response to this feedback, which included more than 500 comments, the task force made several improvements.

KEY DRIVERS OF THE NEW CURRICULUM

Predictive Analytics

The use of predictive analytics has spread to most areas of actuarial practice. There is a clear consensus that actuaries need to know more than the basic regression and time series methods that have been the focus of the ASA curriculum.

Adding predictive analytics to the ASA curriculum presents two challenges. One is to define the specific analytic techniques and depth of coverage to include. For some topics, an understanding of its uses and assumptions might be sufficient; while for others, actuaries might be expected to be able to conduct a complete analysis.

A second challenge is determining the appropriate means of delivering this education and assessing mastery. The traditional closed-book, proctored exam cannot adequately assess the ability to apply sophisticated quantitative methods to complex data sets.

Short-Term/Long-Term Insurance Imbalance

Currently, the Life Contingencies exam covers pricing and reserving for life insurance and annuities, but it does not cover statistical estimation and inference for the underlying models. The corresponding short-term exam concentrates on modeling methods, including estimation, but does not cover pricing or reserving. These two major areas of actuarial practice should receive symmetric treatment.

NEW CURRICULUM

The new curriculum will continue to be a combination of Validation by Educational Experience (VEE) courses, subjects assessed by proctored exams, e-Learning modules and

IMAGINED

ASA COMPONENTS

1

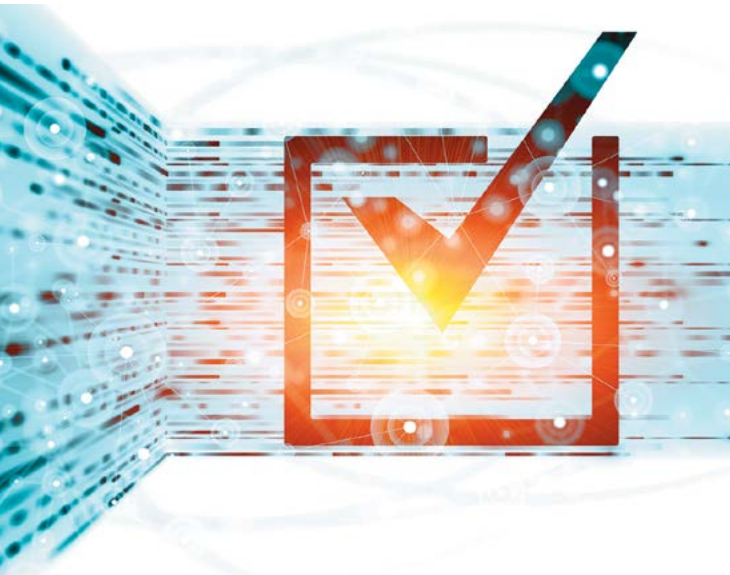
**MATHEMATICAL
FRAMEWORK**

2

**INTRODUCTION TO
ALL PRACTICE AREAS**

3

**PROFESSIONALISM
AND STANDARDS
OF PRACTICE**



a seminar. The addition of predictive analytics is the most significant change.

In total, the number of components is increased from the current 10, which are three VEE subjects, five formally examined subjects, Fundamentals of Actuarial Practice (FAP) and Associateship Professionalism Course (APC). The new curriculum has 12 components, with three VEE subjects, seven formally examined subjects, FAP and APC. The major changes are:

- VEE Applied Statistics is replaced with VEE Mathematical Statistics.
- Basics of applied statistics is a new exam (Statistics for Risk Modeling).
- Addition of accounting to the Corporate Finance VEE.
- Less emphasis on derivatives and more on investment.
- Addition of an exam on predictive analytics.
- Movement of some Exam C topics to make room for pricing and reserving of short-term insurances.

Validation by Educational Experience

Economics

This subject is unchanged.

Accounting and Finance

There are two changes to the Corporate Finance VEE requirement. One is the addition of accounting, which will provide the background necessary for fellowship work. The second change is that the corporate finance treatment is lighter than the current VEE requirement.

Mathematical Statistics

This topic had been moved to Exam C. With the addition of more general predictive analytics, it is appropriate to return mathematical statistics in full. This is a standard university course.

Formally Examined

The term CBT means computer-based testing. These exams utilize multiple-choice questions and take place at a computer center several times per year.

Probability

This component contains all of the current Exam P probability topics. It will continue to be assessed by CBT.

Financial Mathematics

This is the interest theory portion of the current FM exam with some minor changes. It will continue to be assessed by CBT.

Investment and Financial Markets

There is a change from the current Exam MFE. Stochastic calculus has been reduced, as have some of the other mathematical topics. The syllabus adds some corporate finance and portfolio theory topics. It will continue to be assessed by CBT.

Long-Term Actuarial Mathematics

This is a replacement for the current Exam MLC. A few topics from the current syllabus have been removed, while some estimation topics that are currently on Exam C have been moved here. Coverage of universal life will be moved to FAP, and a section on life and annuity products will be added. This exam will continue to be a combination of multiple-choice and written answers.

Short-Term Actuarial Mathematics

This is the replacement for the current Exam C. This exam will undergo the largest change. The basic material on estimation has been moved to the Mathematical Statistics VEE, and specific material on life table estimation appears in the Long-Term Actuarial Models exam. These topics are replaced with product-oriented information relating to short-term insurance. Pricing and reserving will be added. This exam will continue to be CBT.

Predictive Analytics

There are two components specifically devoted to predictive analytics.

Statistics for Risk Modeling

This is the transition component from mathematical statistics, as presented in the Probability exam and Mathematical Statistics VEE, to predictive analytics and its applications. It covers the regression and time series topics formerly in the Applied Statistics VEE subject. This exam will add the generalized linear model. This exam will be CBT, and it also will be a formal prerequisite for Predictive Analytics.

Predictive Analytics

This is a completely new topic for the ASA curriculum. Candidates will be expected to use computer packages to analyze data sets and communicate their findings. An e-Learning module will explain the modeling process. Candidates will use case studies to learn the various methods. The assessment will require the use of software and will take the form of a report.

FAP and APC

Fundamentals of Actuarial Practice

FAP will have few changes as a result of the new curriculum.

Associateship Professionalism Course

A few personal and professional practice topics may be added to the APC.

TRANSITION RULES

Candidates who are not an ASA by July 1, 2018, must complete the new requirements. Candidates who are an ASA by July 1, 2018, are exempt from the new requirements, provided they also earn fellowship by July 1, 2022. There also will be revised requirements for earning the CERA credential. ■



For detailed information, visit [SOA.org/curriculum changes](https://soa.org/curriculum-changes). The SOA will distribute additional information when the syllabus is more fully developed.

Jeremy J. Brown, FSA, MAAA, EA, is president-elect of the Society of Actuaries.

jjbrown@soa.org



Exams



Research
Support



Professional
Development

Volunteer Now

Help Support the Actuarial Profession

Become an SOA Volunteer today! There are opportunities in research support, exam grading, professional development and much more. There are volunteer activities specific to Canada and other countries, too. Visit [SOA.org/Volunteer](https://soa.org/Volunteer) to gain new experiences and expand your network.





Q&A

THE INSIDE TRACK

Q&A WITH VINCE GRANIERI, CEO OF PREDICTIVE RESOURCES LLC

Q: Tell us about your background. How did you decide to become an actuary?

A: For much of my career, I held chief actuary and/or CFO roles in the life and annuity segment of our industry. Thanks in part to finishing my FSA at a relatively young age and earning an MBA, I was on the fast track to senior management at a life insurance company. Then came the abrupt hairpin turn (some would say multicar pileup), and I emerged as a consultant in a small consulting firm where I remain to this day.

Keep in mind that if you are as old as I am, you did not grow up seeing actuary at the top of the desired job rankings.

Vince Granieri, FSA, MAAA, EA, is the chief executive officer of Predictive Resources LLC.

vgranieri@predictiveresources.com

“On the track, there is no substitute for seat time, meaning actual driving versus classroom sessions (which are helpful, but never provide the equivalent experience). It’s the same for building a repertoire of predictive modeling skills.”



@CHRIS CONE

The profession was quite obscure. When I was in the eighth grade, I caddied at the local golf course for an insurance agent who asked me what I wanted to be when I grew up. I told him I didn’t know, but it would probably involve math, because I liked math. He said I should consider becoming an actuary. Like most eighth graders, I had no clue what an actuary was. My dad worked at a small life insurance company, and when I asked him about it, he became ecstatic—probably because he knew how rare actuaries were (this also shows my age). At that point, I began to gravitate toward the actuarial profession. With a few speed bumps on my path and some well-timed steering inputs, I eventually got there.

Q: How did your work history segue into your interest in predictive analytics?

A: When I graduated from Ball State’s actuarial program, I knew I was going back to school in two years to work on an MBA at Harvard, so my job search process was somewhat unusual. I really didn’t have a preference among life/health versus pension or company versus consulting, so I wanted to survey all of those different opportunities early on. I began in the individual life department of a large multiline carrier. After graduating from Harvard, I moved to pension consulting for a few years and then to life insurance consulting/investment banking. At that point, I committed to working at life insurance companies. Over the next 25 years, I worked as chief actuary and/or CFO

for a number of life companies. Then in the early 2000s, I essentially worked myself out of a job and needed something to do. I started a consulting firm and have been an independent consultant ever since, except for a few years when I worked with an independent underwriter.

It was that underwriting work that brought predictive modeling to my attention. The independent life underwriting firm was accumulating data at a rapid rate. The firm hired me to help make heads or tails of it. At first, I followed a fairly traditional path of charting actual-to-expected (A/E) results by age, gender, smoking status and level of impairment, adjusting mortality assumptions to tighten the A/Es. Enlightenment came later, with the creation of a medical advisory board made up of prominent biostatisticians and epidemiologists who worked nearby. As our data grew, we enlisted their aid in furthering our analytical efforts. Under their tutelage, I learned about predictive analytics. I would say a collegial and/or mentoring environment is a key success factor in predictive analytics. This is analogous to having an experienced instructor riding with me on the racetrack to provide instantaneous feedback.

Q: As the CEO of your own company, what about your business fuels your fire? What keeps you up at night?

A: The most exciting element of my business is knowing that we (my firm) have never done the same thing the same way twice—ever. And I expect we never will. We look to

improve with every iteration, even for repetitive tasks. Clients have come to expect us to raise the bar year after year, and I hope we are up to that challenge.

It's like tracking my car at the Mid-Ohio Sports Car Course, where I have run well over 1,000 laps: From day-to-day and year-to-year, I want my last lap to be faster than my first.

There are many issues that vie for my attention at night, but they generally fall into two categories:

- ❶ | Are we serving our clients' interests in the best possible way?
- ❷ | Am I providing my associates the best possible work experience?

Q: What skills positioned you for work in predictive analytics?

A: Back to my eighth-grade self: It's important to enjoy the math. That doesn't mean understand all the theory. Beyond that, the critical skills are curiosity, discipline (those who know me well are smirking), practicality and focus.

Q: What skills do actuaries bring to analytics that other professionals may not bring to the role?

A: Given the actuarial stereotypes, this may come as a surprise to some folks, but I would identify the actuary's bias for action as a key element that differentiates us in predictive analytics. The academics who dominate the field are much more deliberate and theoretical, whether it be for research purposes or otherwise. My friends in academia have encouraged me to write papers solely focused on the relationship of atrial fibrillation and heart attacks, when that relationship, while important, was only a very small part of the project I was working on at the time.

Q: What advice do you have for people who may be interested in positions in predictive analytics?

A: Two things: Find that collegial/mentoring environment that I referenced, and learn on a real-world problem.

Q: What general advice would you give to someone who wants to start his or her own company?

A: First, embrace the internet. When I started my first company in 2003, the internet made it possible for me to leverage myself in ways I couldn't have imagined in the 1980s or even the 1990s. Since then, it has become even more ubiquitous and enabling for entrepreneurs.

Second, let's revisit that list of critical skills: curiosity, discipline, practicality and focus. There is a trap for companies, thinking every associate needs to possess all of the critical skills; not true! In an organization, all of the skills need to be covered, but expecting someone who is curious also to be disciplined is a tall order. On the track, the cars that excel speeding down the back straight are often not the fastest in the turns.

Third, you should be comfortable with never feeling comfortable—it is a binary life of either having too much business or not enough. You likely will not want to turn down any business because you don't know when the next opportunity will come. Yes, it can be a real roller coaster existence.

When I am tracking my car, I cannot advance my driving skills unless I—carefully and in a controlled fashion—get to the edge of my comfort zone and maybe go a little further. It's the price I pay if I want to get better.

Finally, because of all I have mentioned, it's good to have the support of family, friends and fellow professionals. Thankfully, my wife of 34 years, Irene, has been a fantastic friend, counselor and confidant. Her patience and encouragement have contributed greatly to my success.

Q: How did you learn the tools and techniques of predictive modeling? What sparked your interest in this area?

A: It started with a real passion for statistics, which I developed while studying for the old, old Part Two of the fellowship syllabus. Once I started down the managerial track in my career, that passion became dormant as I looked to develop leadership skills to better equip myself to serve the associates in my chain of command. When I started my own practice, I was forced to become more hands-on and focus on developing skills that clients would value in the marketplace.

This theme continued as I became associated with the independent underwriter. As I looked at the traditional approach to fine-tuning underwriting debits and credits, I was not satisfied. We had reams of data specific to the individual impairment, but we only could find statistical significance when we aggregated the impairments and

looked at the overall level of impairment. That meant we grouped all of the severely impaired folks together, regardless of whether they were severely impaired due to heart disease, cancer, cognitive issues or other things. Intuitively, that made no sense to me.

Thankfully, it made no sense to the epidemiologists and biostatisticians, either. They introduced us to the predictive modeling techniques they used to forecast life expectancy for kidney dialysis patients or survival rates of people who followed the Mediterranean diet. It was an involved, hands-on process that took some time. Fortunately, I also was able to learn from some talented, curious IT folks, who used their programming skills to build complex functions that allowed me to become much more efficient in my efforts.

On the track, there is no substitute for seat time, meaning actual driving versus classroom sessions (which are helpful, but never provide the equivalent experience). It's the same for building a repertoire of predictive modeling skills.

Q: Tell our audience some things they may not know about predictive analytics.

A: I've learned so much about predictive modeling that goes against the grain of my instincts. It's like the overwhelming urge to slam on the brakes when you feel the back end of the car start to break loose; in reality, the correct action generally is to apply more throttle.

First, please know that simple yet powerful and effective tools like odds ratios exist. It takes very little effort to master these tools, and they provide tremendous insights. Before doing any regression techniques, I often calculate odds ratios to help me get a feel for the data.

But there also are tools that produce complicated analyses. Although these require more effort to understand, they are very simple and quick to run, which can greatly leverage your efforts. For example, the Cox Proportional Hazards model is quite powerful and quick once it is mastered.

Successful use of predictive analytics requires you to start slow to finish fast. Data preparation is key. In fact, the preparation phase will or should take most of your time. The analogy on the racetrack is that it's not the car that enters the turn fastest that ultimately wins; it's the car that exits the turn fastest, which often means entering at a slower speed.

Finally, I was very pleased to discover that our industry data is superior! What we consider inadequate and statistically unreliable others are willing to write about in

scholarly publications. This portends well for actuaries who want to expand the role of predictive analytics.

Q: Where do you see opportunities for actuaries in the predictive analytics arena?

A: Notice the excellent segue from the previous question. Because we have so much data to begin with and the available data universe is ever expanding, it's up to actuaries to find ways to marry these two worlds and produce better forecasts. Life, health, pensions—the industry segment doesn't matter, because the opportunities are all there.

Q: If you could turn back the clock, knowing all that you know now, would you choose the actuarial profession again? If yes, why?

A: There's a loaded question! Yes, of course. The actuarial profession has been a great one for me. Looking back, there are some things I might consider a little differently than I did, however. For example, early on I was so concerned with career path and scoping out exactly the right career decisions; in reality, so much was outside of my control. We think we're in the driver's seat, but we may be in the passenger seat or even the back seat. I'd trade a well-crafted career plan for a deeper understanding at each stage of my development.

Because we are on the subject of the actuarial profession, let me add one more thing: There are great people in our profession—folks who go out of their way to help others. The Porsche Club of America has a saying—It's not the cars; it's the people. As far as I am concerned, regarding the actuarial profession—It's not the numbers; it's the people.

Q: How do you see the role that predictive analytics plays in the actuarial profession changing over the next five to 10 years?

A: We are entering the golden age of predictive analytics in the actuarial field. More and more data is becoming available, yet considerable judgment and discipline are required to properly analyze and interpret it. These kinds of challenges always have been in the purview of the actuary, and I see no reason why that should change. The old timers out there will remember one of my favorite quotes, attributable to John Ruskin, which was the SOA motto at one time: "The work of science is to substitute facts for appearances, and demonstrations for impressions." To that, I will add, "Actuaries, start your engines, errr, computers!" ■



LIVING to 100

SOCIETY OF ACTUARIES
INTERNATIONAL SYMPOSIUM

Jan. 4–6, 2017
Orlando, Florida

Save the Date

Registration for the [2017 Living to 100 Symposium](#) will open soon. This prestigious event on longevity brings together a diverse range of professionals, scientists and academics to discuss:

- How and why we age;
- Methodologies for estimating future rates of survival;
- Implications for society, institutions and individuals;
- Changes needed to support an aging population increasing in size;
- Applications of existing longevity theories and methods for actuarial practice.



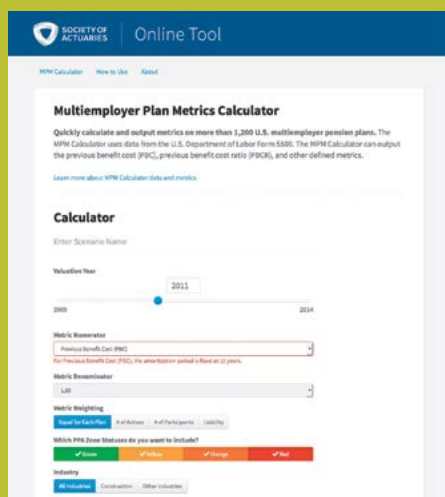
Learn more at LivingTo100.SOA.org.

FAST AND FREE

ONLINE

NEW CALCULATOR FOR MULTIEMPLOYER PENSION PLANS

The Society of Actuaries (SOA) recently released the Multiemployer Plan Metrics (MPM) Calculator. With this tool, you can quickly calculate and output metrics on more than 1,200 U.S. multiemployer pension plans. The MPM Calculator replicates the calculations from the SOA Multiemployer Plan Stress Metrics research and its recently updated report. meplanmetricscalc.SOA.org



Looking to be a leader in your workplace or in your profession? Here are some resources that can help.

APP

ACTUARIAL GLOSSARY— FROM A TO Z

The Actuarial Glossary contains several hundred actuarial terms and their definitions to assist actuaries in their everyday work. Terms from the Actuarial Glossary can be shared via email and marked as favorite for easy retrieval. Actuarial Glossary users also may request new terms be added to the Glossary to further enhance and enrich this robust reference tool for actuaries.

bit.ly/ActuarialGlossary
FREE

ONLINE

SOA CPD TRACKER— MANAGE YOUR CPD CREDITS

Manage your continuing professional development (CPD) credits with the SOA CPD Tracker, a free web tool and downloadable application. The tool now includes a new crowdsourcing feature so you can submit an activity for others to search for and add from the CPD catalog. Access the SOA CPD Tracker now.

SOA.org/CPDTracker
FREE



**REACH MORE THAN
26,000 ACTUARIES FROM
DIFFERENT DISCIPLINES**

**Be a 2017
SOA Sponsor**

New options available

CONTACT

Andrea Lee at alee@soa.org or 847.706.3647

SOA.org/Sponsorships



**SOCIETY OF
ACTUARIES**

CONSTRUCTING

DEVELOPING A CONCEPT MAP FOR PREDICTIVE ANALYTICS

BY STUART KLUGMAN

To successfully use predictive analytics on projects, an actuary or other practitioner will need to decide and/or be able to _____.

How would you complete the sentence? How would your peers complete the sentence? Only you can answer the first question. This article provides the answer to the second—but you will need to wait until the end. Before that, I will provide some background and explain the process that was used to come up with the answer.



THE FRAMEWORK

It should be obvious that the Society of Actuaries (SOA) is into predictive analytics in a big way with a section, newsletters, webcasts, meeting sessions and seminars. When the SOA Board of Directors (Board) formed the Learning Strategy Task Force, it was clear from prior SOA research and environmental scanning that predictive analytics would be featured prominently in its recommendations. That is how it turned out: One of the 11 recommendations approved by the Board was to create curricula for professional development; the first to be developed was for predictive analytics.

The various professional development tasks from the Learning Strategy Task Force recommendations were assigned to a Professional Development (PD) Task Force, chaired by Terry Long, FSA, MAAA. The PD Task Force in turn asked the Predictive Analytics Advisory Group (PAAG), chaired by me, to oversee a concept mapping

exercise to fill in the blank. Once completed, it becomes possible to build a curriculum that will provide actuaries and others the opportunity to become that person.

CREATING THE CONCEPT MAP

Concept mapping¹ combines qualitative brainstorming to generate ideas followed by, what else, a series of analytic steps to make sense of those ideas. It began with hundreds of people invited to provide as many responses as they wanted to the “focus prompt,” the statement that introduced this article. The result was 488 statements.

Not surprisingly, many of the statements were similar. It was a fairly easy process to pare them down to 87 unique statements. Here are some randomly selected statements from those 87:

- Use holdout data to validate a model.
- Apply the principal components method.
- Identify and explain surprise findings.
- Clean and prepare the data for its intended use.

The members of the PAAG and additional predictive analytics thought leaders (30 in total) then went through a sorting exercise. Using an electronic tool, the objective was to place the 87 statements into virtual piles. Statements in a given pile were to be similar to each other and different from those in other piles.

Multidimensional scaling then was used to plot the 87 statements (points) in two dimensions. The basic idea is that the more sorters who put a given pair of statements in the same cluster, the closer those statements will appear on the plot.



25%

50%

CLUSTER ANALYSIS

Then the points (statements) were gathered into clusters using a cluster analysis algorithm. We chose 17 as the maximum number of clusters that would be meaningful. Our next task was to look at the software output, which indicated how the 17 clusters might be combined further. Two PAAG members then looked at the clusters and statements, and decided that a six-cluster solution made sense.

To support the development of the clusters, 106 respondents had provided a relative importance rating for each of the 87 statements. Ratings from a scale of 1 (unimportant compared to the other statements) to 5 (extremely important compared to the other statements) were provided. The full PAAG examined the results. They confirmed the clusters made sense and then named the clusters—each name representing the set of statements in the clusters. They also tweaked some of the statements, reducing the total to 84.

The result is six clusters. For each, the average relative importance score is given, along with a brief description. The scores didn't vary much, as it appears all six clusters have value. It is not surprising that communication ranked highest. It doesn't matter how brilliant the analysis is if the analyst cannot convince anyone else of its value. It is possible that the lower overall rating for methodologies and tools is a function of the respondents' roles—many of the respondents are in more senior positions and are no longer in the trenches. The order of the clusters outlined in this article is, to some degree, the same as the steps in the modeling process. In total, the clusters will provide a framework for the predictive analytics curriculum.

As you read through the description of each cluster, you might want to consider where you would assign each of the four sample statements provided earlier in this article.

Project Management and Planning (3.47)

For those familiar with the Fundamentals of Actuarial Practice course or the Actuarial Control Cycle, this is the “define the problem” stage. Here it is important to understand the goals of the analytics exercise, with particular attention being paid to those who will use the results. With the goals in mind, a project plan can be devised (and thus project planning skills are on the list) that will include data needs, personnel needs (which implies understanding how to build and manage a team), technology needs and other resources, and an understanding of regulatory constraints.

Data Engineering and Management (3.44)

Termed “data wrangling” by one of our respondents, this skill requires the ability to take wild and uncooperative data and

teach it to obey your software commands. More seriously, analysts need to determine the appropriate data sources, acquire that data, and then ensure it is clean and fit for the uses identified in the project plan. There may be storage and retrieval issues, challenges with respect to organization (particularly if it is of high dimension with many linkages), missing data problems and privacy constraints.

Model Design Principles and Processes (3.50)

This and the next cluster represent the “design the solution” phase of the control cycle. This cluster represents the mechanics of building a model. It begins with choosing a model and/or technique that is appropriate for the problem. Selection techniques, both between and within models, must be employed to, among other things, select variables, employ transformations or interactions, and select error distributions. Tools, such as hypothesis tests and residual and q-q plots, will aid in making those decisions. Throughout, modeling principles, such as parsimony, should be employed.

Modeling Methodologies and Tools (3.05)

The analyst's toolkit needs to contain a sufficient variety of models so that an appropriate one can be employed. The list compiled for this exercise included (in no particular order): time series, generalized linear and generalized additive models, hierarchical models, principal components models and machine learning methods in general. Along with that, there should be knowledge of modeling platforms and tools, such as SAS, R, Python, SQL and VBA.

Model Validation and Performance (3.54)

The final step of the control cycle, “monitor the results,” is reflected here. This is slightly different from the diagnostics mentioned under the modeling process. Here the best model has been developed, and it is time to confirm that a valid choice has been made. Techniques, such as stress and scenario testing; graphical assessments, such as gain and lift curves; and using holdout data can be employed. If not done previously, model limitations should be documented, and uncertainty in estimates and predictions quantified. Finally, plans for maintaining and updating the model should be made.

Communication (3.58)

While there likely will be communication throughout the process, both within the team and to other stakeholders, this cluster is mostly about sharing the results of the analysis. Paramount is crafting the message to the intended audience. Oral and written communications need to provide the right

amount of detail and make appropriate use of graphs and tables. Appropriate uses and limitations of the analysis need to be communicated and, of course, appropriate standards of practice must be followed.

Now that you know what your peers believe to be the core concepts in predictive analytics, look for future professional development opportunities from the SOA to help you enhance your own mastery of them. Visit SOA.org/PDcalendar.aspx. ■

Reference

¹ Concept mapping analysis and results conducted using The Concept System Global MAX software: Concept Systems Inc. Copyright 2004–2016; all rights reserved.

Stuart Klugman, FSA, CERA, is senior staff fellow, Education, at the Society of Actuaries.

sklugman@soa.org

findings

DEVELOPING A LEARNING STRATEGY

BY MICHAEL EWALD

As a member of the Predictive Analytics Advisory Group (PAAG), I had the honor of joining experts in the predictive analytics field to determine the foundation of the Society of Actuaries' predictive analytics curriculum. As I prepared to meet with the PAAG, I found that the concept mapping framework aligned very closely with an article I was reading on performing k-means clustering in Python. It is very fitting that we developed a learning strategy for predictive analytics by actually using predictive analytics.

The project mapping process created a framework that aligns very closely with how predictive analytics is used in the workplace. The six clusters we developed mirror the model building process. Having worked in this arena for some time, I feel the PAAG has developed core concepts upon which we can build a comprehensive education. My hope is that the curriculum provides not only a solid education to future actuaries, but also serves as a reference for practicing modelers.



Michael Ewald, FSA, CERA, CFA, is a director at The Hartford for the Group Benefits division.

Michael.Ewald@thehartford.com

SOCIAL IMPACT

BY R. DALE HALL

While there are many different types of research projects that we conduct and fund through the Society of Actuaries (SOA) for our members and the industry, I want to specifically mention research that has particular public interest and social impact. In past articles, I've mentioned the retirement risks survey findings and the work with health care coverage, and since then there have been several more activities.

For instance, we currently are developing a U.S. public pension plan mortality table study. This public pension research will be a useful reference for these plans to consider in their valuations. It builds upon our continued work within the Retirement Plans Experience Committee to update private pension mortality tables and mortality improvement models. And, of course, there is the previously-commissioned report from the Blue Ribbon Panel on Public Pension Funding, which helped provide further insights within pension funding.

Earlier this year, we expressed interest in pursuing research on practice expansion and socially relevant topics. The SOA Research Executive Committee is helping cultivate innovative and practical ideas that expand the boundaries of the actuarial profession to new practice areas and emerging topics. These efforts are helping create additional intellectual capital that serves the interest of the public. We established a goal on research with social relevance to help keep the profession focused on objective research that the public and other stakeholders can use to inform their decisions on key societal issues. Stay tuned for updates on the progress of those proposal requests and the potential for new research in these areas.



action

RELATED LINKS

Research-At-A-Glance

bit.ly/At-A-Glance

Research Opportunities

bit.ly/SOAResearchOpportunities

SOA Engage Research Community

engage.SOA.org

We also are gathering research volunteers for SOA Project Oversight Groups (POGs) on research focusing on climate, weather and environmental sources. Consider volunteering some of your time and expertise with one of these POGs. The groups will help identify research projects to consider on climate, extreme weather events, and environmental sustainability affecting the insurance industry and government agencies. This research is in addition to the collaborative efforts with the American Academy of Actuaries, the Casualty Actuarial Society and the Canadian Institute of Actuaries to launch the Actuaries Climate Index. This index brings together data analysis on severe weather in the United States and Canada.

I encourage you to visit SOA.org for updates on our ongoing research projects and new proposals. Additionally, visit the SOA Engage Research Community at engage.SOA.org, where you can comment on the latest research, share your perspectives and discuss new research ideas. ■

VISIT
SOA.org

Visit SOA.org/Research for the latest updates on new research opportunities, data requests, experience studies and completed research projects.

R. Dale Hall, FSA, CERA, MAAA, is managing director of Research at the Society of Actuaries.

dhall@soa.org

GOOD RESEARCH READS

HUMAN MORTALITY DATABASE: NEW PROJECTS IN DEVELOPMENT

The Society of Actuaries (SOA) will support a major undertaking with new work on the Human Mortality Database (HMD) through researchers at the University of California, Berkeley. Spanning 38 countries, the HMD provides detailed mortality and population data to researchers, students, journalists, policy analysts and others interested in the history of human longevity. The SOA's grant will help the researchers create a historical time series of mortality tables specific to causes of death for eight populations (United States, Japan, England and Wales, France, Sweden, Norway, Canada and Chile). Another SOA-sponsored project will analyze U.S. life table series at a state level from 1959 to 2013. The HMD details are accessible at mortality.org.

NEW ESSAY COLLECTION EXPLORES DIVERSE RETIREMENT RISKS

The SOA Committee on Post-Retirement Needs and Risks released a new collection of essays on diverse risks encountered in retirement. The essays focus on three primary areas: defined contribution plan risk management strategies, decumulation strategies for retirement and long-term care financing. The essays represent a wide of range of thinking in these areas and will be used to inform future committee efforts. bit.ly/DiverseRisks

LUMP SUM INSIGHTS

The SOA developed an issue brief for the public, which provides consideration when deciding whether to take a lump sum distribution or a monthly pension for life.

bit.ly/RetireInsights

TAKE CHARGE

Continue the cycle of continuous improvement and identify new experiences to pursue. Attend a meeting or seminar. Tune in to a podcast. Take an e-course. These are great ways to take charge of professional development and can help you:

- 1 | Develop leadership skills
- 2 | Stay up-to-date with current business trends
- 3 | Expand your network base
- 4 | Make meaningful contributions to your company, your team and the profession

MEETINGS

Longevity 12

Sept. 29–30

Chicago

Product innovation, sidecars, data reliability challenges and timeliness will be the key themes of Longevity 12. Leading international industry and academic representatives from different fields, along with policymakers, will converge at the meeting. Discussions will focus on the assessment of longevity risk, as well as market and government developments. Responses needed by pension funds and insurance companies to manage this risk also will be highlighted.

SOA.org/Longevity12

2016 SOA Annual Meeting & Exhibit

Oct. 23–26

Las Vegas

Make plans to attend the most dynamic actuarial event of the year. Comprising more than 160 sessions and networking events, the 2016 SOA Annual Meeting & Exhibit is poised to be one of the largest in history. Packed full of expert speakers, leading actuaries and world-renowned keynote speakers, this year's meeting will showcase the best the industry has to offer. Register today and join this diverse group of global experts.

SOA.org/annualmeeting



E-COURSES

Decision Making and Communication

Today's actuaries must apply their advanced technical skills within the context of increasingly multifaceted business and management demands. Nontechnical skills also are central to the actuary's success as a well-rounded business professional and adviser. This e-course provides a foundation for making decisions related to complex business problems that require the involvement of many stakeholders and decision makers.

SOA.org/decision-making

Social Insurance

This e-course describes social insurance programs, their operation and the current issues they are facing. Most of the content reflects the Social Security and Medicare programs in the United States and Canada. However, readings on social insurance programs are included.

bit.ly/SOA-SI-course



SEE AD ON
PAGE 15 FOR
MORE DETAILS



Visit SOA.org/calendar for the full complement of professional development opportunities.



SOA **Elections** 2016



VOTE TODAY!

Elections open August 22 and close September 9. Visit soa.org/elections.
Elections questions? Write to elections@soa.org.



PolySystems, Inc.
Actuarial Software & Data Solutions

Discover the Advantages of Partnering with PolySystems for PBR

PolySystems' core strength is providing comprehensive software solutions designed to meet regulatory reserve requirements. PolySystems users can perform the entire VM-20 calculation from a single platform, an approach that offers many advantages.

- One actuarial team controls the entire VM-20 calculation, streamlining the VM-20 reserve component calculations, sensitivities, analyses, and internal and external documentation requirements.
- When the NPR and Deterministic Exclusion Test are run in the same calculation engine as the Stochastic Exclusion Test, Deterministic Reserve, and Stochastic Reserve, there is no need for reconciliation of calculation mechanics, in force files, or product assumption tables.
- Governance and controls are easier to define and maintain.
- PolySystems' unparalleled auditability facilitates model validation of all VM-20 calculations.
- Our VM-51 utility can easily be incorporated to generate experience data submissions in accordance with the prescribed format.
- PolySystems' actuarial consulting team and our ALM software are the optimal resources as you implement PBR.

PolySystems can help you prepare for all aspects of PBR, including running an impact study, advising on VM-20 interpretation, reviewing VM-20 assumption development, and preparing VM-50/VM-51 experience reports.

Contact us today to partner with PolySystems for PBR.

Bob Keating, Vice President
312-332-8740 • bkeating@polysystems.com

Jason Kehrberg, Vice President
312-332-8646 • jkehrberg@polysystems.com



PolySystems, Inc.
Actuarial Software & Data Solutions

Chicago • New Jersey • South Carolina

www.polysystems.com