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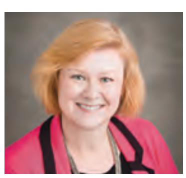
EDITORIAL

A time for reflection

BY KARIN SWENSON-MOORE



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With this issue, I conclude my two-year term as a contributing editor for *The Actuary*. I also recently finished a three-year term on the Society of Actuaries (SOA) Leadership & Development (previously Management & Personal Development) Section Council. I learned and grew professionally and personally from both of these experiences, and I am now considering new ways to contribute to the actuarial profession.

When I was recruited for the contributing editorial board, I hadn't thought much about the process of creating *The Actuary*, or how it might benefit me. Here are some of the expected, and unexpected, pleasures of being a contributing editor for *The Actuary*:

1 | **Expanding your network to include other contributing editors working in disciplines outside your own expertise.** The editorial board is diverse in experience, location and expertise. I was acquainted with exactly one other person (by coincidence) when I joined the board, but now have friends from many disciplines whom I look forward to seeing at SOA events or contacting with a question outside of my health actuarial specialty.

❷ | **Developing editing and constructive feedback skills.** A key role for contributing editors is to review every submitted article for content and provide feedback to the authors. Reading and editing the work of others has improved my own writing skills by sharpening my eye to length, style and rhythm of writing. It's not easy to provide meaningful (and tactful) written feedback to someone you may not know, but it's rewarding when that feedback results in an improved article. (That review also sometimes creates some lively email discussions among the editorial board, with more opportunities for sharing opinions in a constructive manner.)

❸ | **Thinking more globally about the interests of the SOA membership.** During my time on the editorial board, we have adjusted our model to determine a broad theme for each issue, and to designate a contributing editor (or two) to lead the content development for that issue. The editorial board and SOA staff work together to develop the calendar and themes to reflect current interests and topics that are meaningful to a broad section of our membership. We also try to include sufficient context within articles to allow the less-expert actuarial reader to follow, while still engaging those with greater subject-matter knowledge. I'm more sensitive to the broad interest base of the SOA now, in particular our growing number of international members.

❹ | **Developing "influencing without authority" skills.** A contributing editor has no ability to force a volunteer writer to do anything, and it can be difficult to find contributors. Last year, I worked with another editor to compile an article with comments from health actuaries about their experiences implementing the Affordable Care Act. Initially, I thought the survey responses would flood my inbox. However, that was not the case, and I had to spend more time than expected following up with potential responders in my network, addressing their concerns about the article and providing extra time to respond. Fortunately, the extra effort and networking resulted in many helpful and interesting contributions. After giving responders a chance to review the compiled article, the article was completed on time.

❺ | **Reading and learning more outside of your specialty.** Before joining the editorial board, I tended to focus on readings that directly affected me as a health actuary in a management role. Making time to review submitted articles on varied topics has increased my awareness of the entire profession and makes me think more about using that information in my health actuarial work.

❻ | **Learning more about the behind-the-scenes work by the SOA staff.** Putting together a bimonthly magazine is a lot of work, and deadlines approach quickly. I have a new appreciation for the staff's support for the SOA membership.

My volunteer status change opens opportunities for someone else. Maybe that someone is you. I hope you'll consider how you can learn and grow by contributing to *The Actuary* and to the actuarial profession. Send your article ideas to ***theactuary@soa.org***.

Thanks to all who provided me with the opportunities to contribute and grow over the past two years in this role. Please enjoy this issue. ■

Send your article ideas to ***theactuary@soa.org***.

SEND RESUMES TO actuaries@EzraPenland.com

CALIFORNIA – HEALTH CONSULTING ACTUARY
California consulting firm seeks a health FSA or near-FSA actuary for Position 66867. Must have 5 to 12 years of healthcare actuarial experience. A strong understanding of health reform is required, as are outstanding communications skills.

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ILLINOIS – MEDICAID OR MEDICARE EXPERIENCE
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SOUTHEAST USA – HEALTH CONSULTANT
For Position 67160, a health consulting actuary is sought by a Southeast USA actuarial consulting group. FSA or ASA with 11+ years of healthcare actuarial experience preferred. Consulting experience not required.

CONNECTICUT – LIFE ACTUARY / MODELING SKILLS
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SOUTHEAST USA – INDIVIDUAL LIFE MODELING
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ILLINOIS – RECENTLY-CREDENTIALED LIFE FSA
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FLORIDA – PENSION ACTUARY
For Position 67198, our Florida client is looking to hire a pension ASA or near-ASA actuary. OPEB valuation experience required. Must have 5+ years of experience. Prominent nationally-recognized firm. Immediate need.

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WEB EXCLUSIVE!

The following is an excerpt from Society of Actuaries' President Craig W. Reynolds' address to members at the 2015 SOA Annual Meeting & Exhibit. Watch the video (***bit.ly/SOA2015Video***) or read the transcript (***bit.ly/2015Transcript***) of the speech in its entirety.

from the **PRESIDENT**

Five essential ideas for 2016

BY CRAIG W. REYNOLDS

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

craig.reynolds@soa.org

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As president, there are five essential ideas I would like to focus on for the year ahead:

1 | Maintaining the value of our credential.
2 | Strengthening relationships with other organizations.
3 | Expanding the breadth of work performed by actuaries.
4 | Encouraging diversity within our profession.
5 | Supporting our members in international markets and enhancing the global reputation of our organization.

To maintain the value of our credential, we cannot stand still as the world evolves. Our curriculum must change to meet the needs of the public and current and prospective employers. Our research must constantly push forward the frontiers of knowledge and provide practical solutions to important societal problems. The rigor and validity of our examination process must remain beyond reproach.

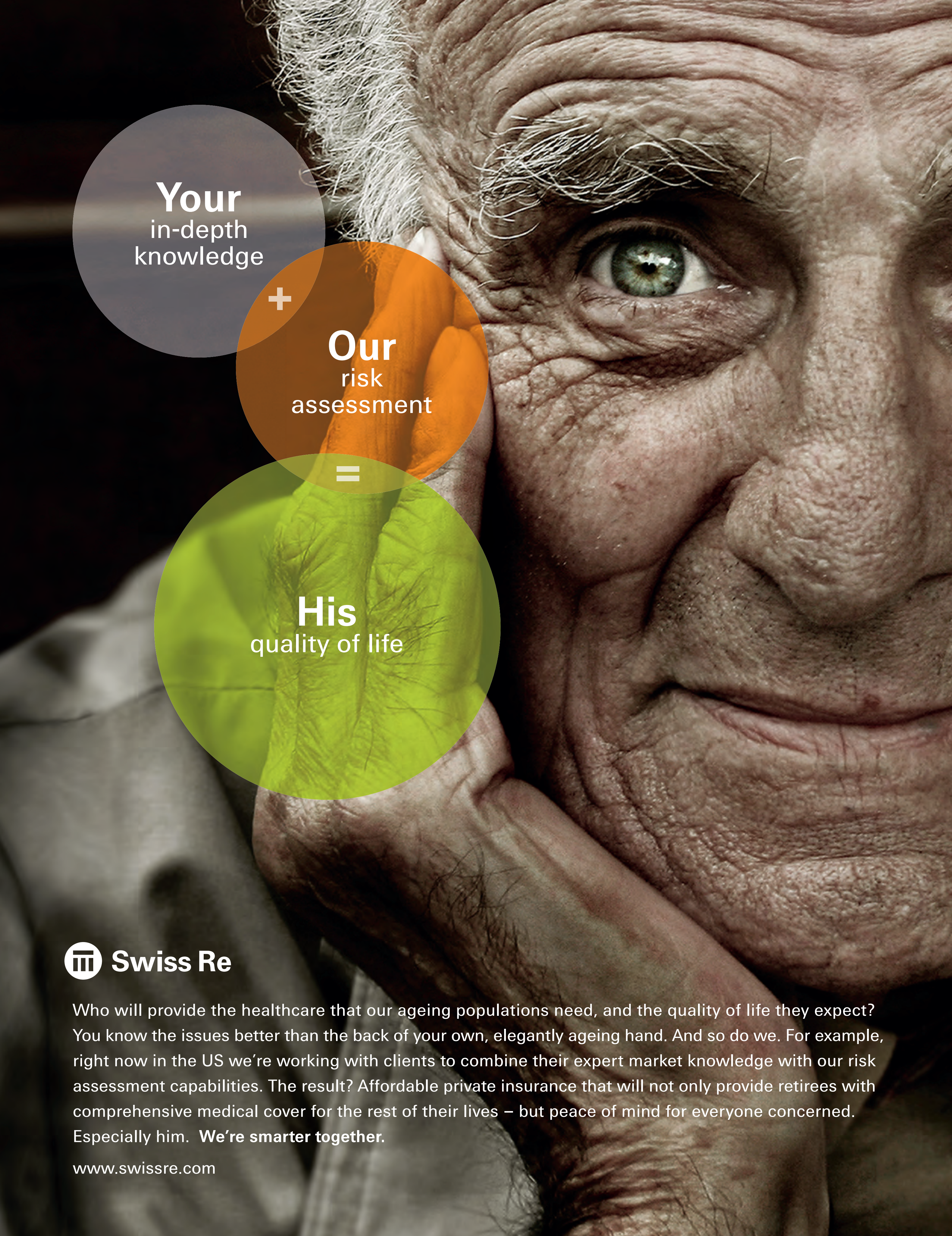
In addition to education efforts to support the credential, the Society of Actuaries continues to develop leading research reports and experience studies. We have completed research on multiemployer pension stress metrics and corporate pension risk, and last fall we released experience studies on private pension plan mortality.

Several life research projects have also been completed, including projects on understanding modeling and mitigation of extreme events, exploring the implications of new mortality tables on insurance products, and the impact of interest rate volatility on life insurance and annuity products.

This year, the new SOA health research on implications of pent-up demand was released. This research is a preliminary perspective on health services that may be deferred or avoided due to financial constraints as a result of individuals not having health insurance.

In the property and casualty field, we are currently developing research projects in General Insurance for 2016 as part of efforts supporting the SOA's General Insurance track to fellowship. We are also working with the Casualty Actuarial Society (CAS), the Canadian Institute of Actuaries and the American Academy of Actuaries to release the Actuaries' Climate Index, which analyzes data on the level of climate volatility. The Actuaries' Climate Index is a great example of the important and high-quality work that can be done when the actuarial organizations work together.

It is vital that members of our profession collaborate for the common good of actuaries, their employers and clients, and the public. These relationships *are* getting better, and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we hope and expect that this trend will continue. Our approach going forward must focus on each organization being the best it can be. We advance the profession by standing taller ourselves, and not by pulling the others down. One of my primary goals as president of the SOA is to make sure that we adhere scrupulously to this philosophy, and I ask the other organizations to do the same.

Collaboration becomes increasingly important as the work performed by actuaries expands. We have seen growth in other markets, such as actuaries in banking in South Africa and Australia. Actuaries are taking on human resources-related roles in Mexico and environmental sustainability efforts in the United Kingdom. The SOA's Cultivate Opportunities Team continues to explore other avenues for broadening the scope of actuarial services. A team of volunteers is working on a pilot actuarial candidate internship program aimed at introducing actuarial students and actuarial science to data analytics firms.

According to the Actuarial Talent survey findings, actuaries are needed to fill predictive analytics roles based on our industry expertise and know-how with models. Actuaries are already analyzing data analytics for insurers, particularly in the health and property and casualty spaces, but also in life, notably in the analysis of policyholder behavior, mortality and morbidity. But we must do more for the actuarial talent currently in the pipeline. We have the modeling skills and statistical knowledge. From Amazon to Zillow, we should OWN this space.

> "We can and must do more to ensure that *everyone* has an opportunity to reap the benefits of our profession and to walk through the gates."

Speaking of different perspectives, the need for diversity in our profession is growing. For too long we have accepted the fact that African-Americans and Hispanics are underrepresented in the North American actuarial profession—each group makes up only around 2 percent of the membership of the SOA and the CAS. According to data from the U.S. Census Bureau, an estimated 82 percent of the U.S. actuarial profession is Caucasian. This data also noted that 33 percent of the U.S. actuarial profession is female, though recent fellowship classes appear to be much closer to 50/50.

The actuarial profession must be inclusive of the diverse population we serve so that we attract the best and brightest candidates. Numerous studies show that diverse teams and employers outperform teams lacking diversity. Confronting the issue of diversity and inclusion head-on will help our employers, our clients and the public.

Yes, the examinations help to make our profession a meritocracy. Some have argued that this is enough. I disagree. Fifty years ago, in a commencement address at Howard University, Lyndon Johnson said:

You do not take a person who, for years, has been hobbled by chains and liberate him, bring him up to the starting line of a race and then say, 'You are free to compete with all the others,' and still justly believe that you have been completely fair. Thus it is not enough just to open the gates of opportunity. All our citizens must have the ability to walk through those gates.

We can and must do more to ensure that *everyone* has an opportunity to reap the benefits of our profession and to walk through the gates.

For over 30 years, the SOA and the CAS have sponsored the Joint Committee on Career Encouragement and Actuarial Diversity to promote the profession and actuarial diversity to high school students and teachers. These efforts include exam reimbursement for qualified students, support for summer actuarial science programs at universities, and supporting the International Association of Black Actuaries through sponsorship of its annual meeting and student boot camp. Both the CAS and the SOA support the Actuarial Foundation as it promotes diversity within the profession through an annual college scholarship program for minority college students pursuing actuarial studies.

Important to note, too, is the ever-increasing global nature of the business world. Through technology and market shifts, we have become increasingly connected. You may already work for a company owned outside of North America, or you may work for an American company with interests outside the United States and Canada. Expanding the reach and reputation of the SOA outside North America has the potential to benefit all of us.

Finally, I will be listening to you, SOA members, for feedback and new ideas. I hope I won't let you down. I am looking forward to the year ahead and hearing more from you on what the SOA can do to strengthen our profession and better serve the public. ■

The latest changes

Whether you travel the world or never leave the borders of 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 SOA IS ON WECHAT IN CHINA

The Society of Actuaries (SOA) is now on WeChat, for our members in China. Download the app on your smartphone and stay up-to-date with the latest SOA news and what's going on with the profession.

Find us at "SOA北美精算师协会."

INNOVATION AND GROWTH, 19TH ASIAN ACTUARIAL CONFERENCE

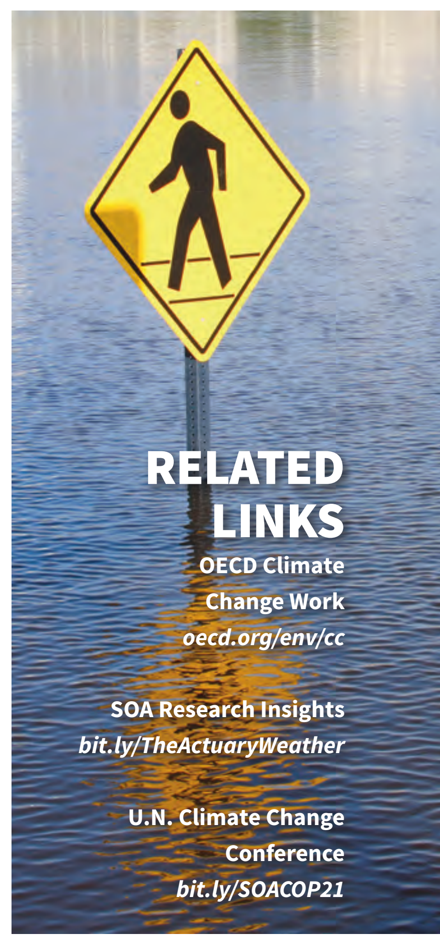
The Society of Actuaries (SOA) was proud to be part of the 19th Asian Actuarial Conference (AAC) that took place Nov. 3–5 in Bangkok, Thailand.

During the opening session, SOA President Craig Reynolds, FSA, MAAA, addressed attendees emphasizing the common ground actuaries around the world share. "While we speak many different languages, we all share the 'language of risk,'" he noted.

Reynolds also highlighted the importance of finding new ways to harness actuarial skills with big data and predictive analytics. "As actuaries, we apply our knowledge in actionable ways to address business risks using predictive modeling and analytics," he explained. "As actuaries, we need to own this area of expertise."

Reynolds was also part of an interactive panel discussion titled, "What Role Does Innovation Play in the Future of the Actuarial Profession?" together with representatives from the Institute and Faculty of Actuaries, the International Actuarial Association and the Society of Actuaries of Thailand.

The AAC is the largest actuarial conference in Asia with more than 700 delegates from countries inside and outside of Asia.



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OECD Climate Change Work
oecd.org/env/cc

SOA Research Insights
bit.ly/TheActuaryWeather

U.N. Climate Change Conference
bit.ly/SOACOP21

THE CHINA COMMITTEE HOLDS FIRST MEETING

The Society of Actuaries (SOA) International Committee has reaffirmed its commitment to SOA members in China with the creation of the new China Committee. The committee held its first meeting in September in Beijing, in conjunction with the China Association of Actuaries (CAA) annual meeting.

SOA members in the region had expressed a special interest in expanding new local programming, combining professional development opportunities and networking, at times and locations convenient for local actuaries. The China Committee's work plan calls for a steady stream of activities and services for mainland Chinese members. Coordinated from one home-based committee with dedicated staff resources, it is aimed at supporting and maintaining the SOA community in China.

The China Committee will focus on stakeholders in China, providing input on critical and current topics for professional development, identifying potential topics and partnerships for research, strengthening already established relationships with universities and building on collaborative efforts outlined in the recently signed Memorandum of Understanding (MOU) with the CAA (*bit.ly/SOA-CAA-MoU*).

The new committee will soon be joined by its partner committee, the Greater Asia Committee, which will focus on members, candidates, universities and related activities to benefit the profession in Hong Kong, Thailand, Taiwan, Malaysia, Singapore and South Korea. These two committees replace the previous structure under the China Regional Committee.

By Ann Henstrand, senior director, International, The Society of Actuaries

OECD SESSION ON CLIMATE CHANGE AND INSURANCE SECTOR

On Dec. 3, 2015, in Paris, the Organisation for Economic Co-operation and Development (OECD) hosted a special meeting on climate change and the insurance sector. Dale Hall, FSA, MAAA, SOA managing director of Research, joined other research and insurance experts on a panel discussion on climate change research. As part of the panel discussion, he presented an overview of SOA research projects and recently completed studies. Topics included severe weather data and climate impact on health care.

THE SOA MEETS WITH MEMBERS, CANDIDATES AND UNIVERSITIES IN ASIA

The Society of Actuaries (SOA) President-Elect Craig Reynolds, FSA, MAAA, and the SOA Executive Director Greg Heidrich visited BeiHang University and Central University of Finance and Economics in Beijing at the end of September.

During their visit, Reynolds and Heidrich gave students and faculty an overview of the actuarial profession, the increasing presence of SOA candidates in Asia and how the SOA is working to implement its strategic vision.

On Sept. 24, 2015, the SOA, represented by Reynolds and Heidrich, hosted a reception for its members in Beijing. This reception was an opportunity for SOA members in the area to network with other professionals in the industry and learn about current SOA activities and developments.

new & noteworthy

WHAT'S HAPPENING

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

UNCERTAINTY FROM GEOPOLITICAL INSTABILITY

Corporations are seeking ways to address and account for geopolitical risks with continued challenges in war-torn countries, major shifts in countries' economies, market challenges and other emerging issues *(reut.rs/1P4xcRU)*. There is an ever-present need *(bit.ly/1KDGYo0)* to proactively manage impacts on the supply chains, as well as to understand enterprisewide solutions that consider the geopolitical challenges.

ADDRESSING GLOBAL CLIMATE RISKS

Leading up to the G20 Summit this past November, there had been ongoing discussions on global climate risks and preparedness levels. For instance, several food manufacturers and the sustainability organization CERES *(bit.ly/1j2xHPy)* announced a call to action *(bit.ly/1Mlx275)* on agriculture impact from the changing climate. Reinsurers and a ratings agency discussed challenges ahead *(reut.rs/1QmE2zu)* with global warming. Additionally, the Bank of England *(bit.ly/1LNgLrb)* recently expressed its concerns about insurance risks and liabilities from climate change.

CMS RELEASES RISK CORRIDOR DATA

This past October, the Centers for Medicare & Medicaid Services (CMS) released insurance payout data from the Affordable Care Act (ACA) risk corridors *(go.cms.gov/1L4gn5V)*. Originally to be released in August, the 2014 data provides insights on the health insurance marketplace. According to CMS, the risk corridors program is expected to pay $362 million *(on.wsj.com/1KQAl3U)*, although insurers requested $2.8 billion to cover their losses.

RELATED LINK

Feds Short Insurers $2.5 Billion on Exchange Plan Losses

bit.ly/CMSLoss

OUT WITH THE OLD AND IN WITH THE NEW

The Investment Section prepares for another year

By Frank Grossman and Jeff Passmore

AT YEAR-END—A TIME TO REFLECT AND LOOK AHEAD

Most people normally celebrate New Year's Eve on Dec. 31. But for some, the new year comes early—in October! The Investment Section, just like the other sections and the Society of Actuaries (SOA) generally, begins its annual cycle during our annual meeting, roughly 10 weeks before calendar year-end. That means that this year, New Year's Eve actually was Wednesday, Oct. 14—the last day of our get-together in Austin.

We've had a good 2015, and if you are a member of the Investment Section, we trust that you got a lot from your section membership. We are expecting a great 2016, and sincerely hope that you will rejoin us if you are a lapsed member or might give us a try if you've never been a member of our section before. As one of the largest of the 20 special interest sections, with roughly 3,000 members and the scale to bring significant value to our members, we are looking forward to a great 2016.

MAY YOU LIVE IN INTERESTING TIMES

As investment actuaries working in insurance, we are confronted with several challenges: a three-decade-long falling interest rate environment; unprecedented near zero interest rate policies from developed market central banks; and the opportunity to provide effective and secure retirement income solutions to fill the void left by employers retreating from pension plans and possible future social insurance program shortfalls.

As pension investment actuaries, we face other challenges: helping corporate pension plans deliver benefit promises while reducing volatility; helping collectively bargained plans find ways to responsibly close funding gaps; and sharing our insights on the public pensions debate regarding the merits of using expected asset returns to discount future benefit payments.

Regardless of where and how you apply your combination of investment and actuarial skills, there is plenty to keep one busy!

2015—A YEAR OF ACCOMPLISHMENT

We accomplished a lot in 2015, and here are some highlights:

- **Access to financial and business journals—**Investment Section members had access to a vast database of current and past articles from publications such as *Harvard Business Review*, *Financial Analysts Journal*, *Journal of Finance*, *Journal of Financial and Quantitative Analysis* and many others via our EBSCO program.

new & noteworthy

- **Networking—**We sponsored events to bring our members together, including the Thomas C. Barham III Speed Chess Networking Event in collaboration with the Technology Section—featuring International Chess Master Carolina Blanco—at both the 2014 and 2015 SOA Annual Meetings. We also reached out to other professional organizations with similar interests, including a February 2015 meeting in New York with the Society of Quantitative Analysts where we discussed liability-driven pension plan investing.

- **Investment contest—**For three years running, the Investment Section has sponsored an investment allocation contest, providing our members an opportunity to pit their wits (and good fortune) against other members. The prizes were iPad minis for the winners in each of three categories: highest return, lowest volatility or best ratio of return to volatility. Look for your chance to participate in the fourth contest next March. All you need is a dartboard and a section membership!

- **Annual meeting sessions—**The Investment Section sponsored a full slate of sessions, plus a section breakfast, at the 2015 SOA Annual Meeting. These sessions provided a forum for section members to hear knowledgeable presenters speak on current investment topics.

- **Investment Symposium—**Last March 26–27, in Philadelphia, we sponsored another Investment Symposium with several tracks and received strong attendee feedback from a broad audience of investment professionals. The upcoming 2016 symposium will be held at the New York Marriott Downtown on March 14–15.

- **Redington prize—**The Investment Section sponsors a biennial contest for the best investment paper by an SOA member published during the preceding two years. The winner of the 2015 prize, "Optimal Portfolios Under Worst-Case Scenarios," written by Carole Bernard; Jit Seng Chen, FSA, FCIA; and Steven Vanduffel received $10,000, and the authors had the opportunity to present the paper during a section-sponsored webcast.

2016—WHAT WILL THE INVESTMENT SECTION DO FOR YOU?

How can we help you be more successful as a professional? What training or networking events can we develop for you? Reach out and let us know. Even better, why not turn over a new leaf in the spirit of the season and find a way to get more involved with the Investment Section! Like most things in life, what you get out is in direct proportion to what you put in.

Frank Grossman, FSA, FCIA, MAAA, is the past chairperson of the Investment Section.

craigmore54@hotmail.ca

Jeff Passmore, **FSA, EA**, is the current chairperson of the Investment Section.

jeffpassmore@hotmail.com

FEATURE
ECONOMIC CAPITAL
MODELING

THE APPLICATIONS OF ECONOMIC CAPITAL MODELS IN MULTINATIONAL REINSURANCE

BY CLINT THOMPSON

One of the greatest challenges that actuaries face is the sheer size and complexity of present day multinational insurance and reinsurance groups. Pricing, valuing and reserving for individual products and lines of business are core parts of the actuarial skill set. Planning and forecasting aggregate expectations for legal entities, business units and overall group results are also important management tools. More recently, economic capital modeling has also become an increasingly important best practice.

The aftershocks of the Great Recession, which began in 2008, are still being felt around the world. Many in the global public and regulatory community today remain skeptical of the ability of current market and regulatory frameworks to understand and monitor the larger and more complicated financial, insurance and reinsurance groups. Both the industry and regulatory communities have been working to strengthen perceived weaknesses.

At the time of writing, more than 30 states have adopted the National Association of Insurance Commissioners (NAIC) model law on Own Risk and Solvency Assessment (ORSA). Additionally, the recent Actuarial Guideline 48 now clarifies regulatory expectations for many life reserve financing captives. The Federal Reserve Board is actively developing approaches to satisfy its mandate to assess and regulate the capital adequacy of the largest systemically important insurance groups. The NAIC is moving forward with the development of a group capital standard. Internationally, Solvency II in Europe is coming into force, and the International Association of Insurance Supervisors also is pursuing a global capital standard.

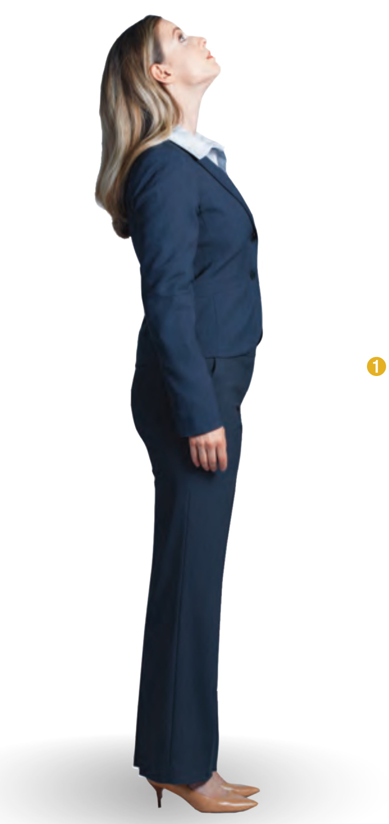
This is clearly a challenging time for companies with multinational operations that are faced with navigating the changing landscape while not losing sight of their primary goal of delivering value to clients by improving the financial security of many individual lives around the world in a cost-effective way. As with any change, there is a strategic advantage for those companies that have a clear view of the underlying economic risks and rewards, and those who are able to react to changing market and regulatory circumstances in a swift and flexible way.

ECONOMIC CAPITAL

Economic capital refers to the amount of financial resources needed to remain economically solvent in extreme adverse scenarios. It usually refers to a company or firm's own internal view as opposed to a specific regulatory or rating agency framework. Actuaries play a critical role in the assumption setting, implementation and interpretation of economic capital models.

There is currently a wide range of practice for implementing economic capital models. The following examples are illustrative of the elements a company needs to consider:

COVERAGE SCOPE | 1
CONFIDENCE MEASURE | 2
ACCOUNTING BASIS | 3
EXIT-VALUE VERSUS RUN-OFF VALUE | 4



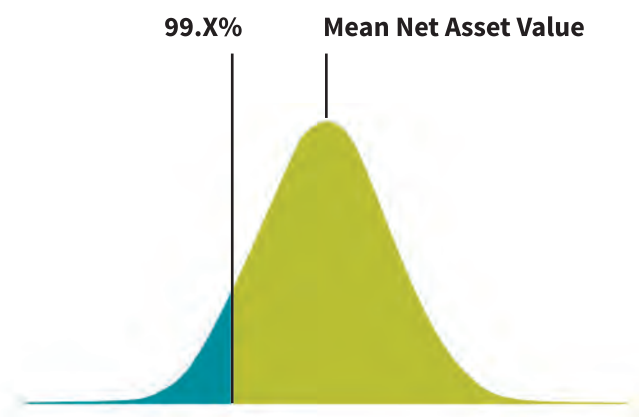
1 | **COVERAGE SCOPE:** Economic capital reporting capabilities across various levels of an organization, including legal entities, business units and the overall group perspective, are now commonly expected. Additionally, a mature economic model will consider all material quantifiable risks, including operational, biometric, property and casualty, market, etc. However, it can be appropriate to explicitly exclude certain risks to facilitate implementation, or when the additional modeling effort would not necessarily improve business decision-making.

2 | **CONFIDENCE MEASURE:** The level of confidence and the risk measure utilized are both key decision points. For example, European Solvency II compatible internal economic capital models must calculate a 99.5 percent confidence level around the net value of assets less liabilities (the value at risk, or VaR). U.S. domiciled groups have greater flexibility to choose other confidence levels and metrics, such as projected long-term surplus, contingent tail expectations (CTEs), etc.

3 | **ACCOUNTING BASIS:** A company may be able to choose its economic capital assessment valuation based on U.S. Statutory, GAAP/International Financial Accounting Standards (IFRS), Solvency II or another valuation basis. Other companies may have less choice based on the applicable regulations.

4 | **EXIT-VALUE VERSUS RUN-OFF VALUE:** A key consideration is whether the accounting and valuation basis used is fundamentally an exit-value approach or a run-off going concern valuation. An exit-value approach attempts to measure a company's current market value consistent with the sale of component business and risks to a third party. Solvency II is based on an exit-value methodology. Alternatively, a run-off approach assumes a long-term horizon; U.S. cash flow testing techniques are generally consistent with a run-off approach.

FIGURE 1 **TAIL ADVERSE RESULTS**



Probability Distribution

RISK = CAPITAL

Economic capital is defined as the amount of financial resources needed to remain economically solvent in extreme adverse scenarios. Economic capital is commonly defined as the difference between the mean net asset value (assets less liabilities) less the net asset value in extreme adverse scenarios (at a specific 99.X percentile or a contingent tail expectation).

There is currently no general consensus on the "best" economic capital methodology. It is likely that there is no single best methodology for all purposes.

Those multinational reinsurers domiciled within the European Union are now subject to Solvency II from both a Group and European entity regulatory perspective. Those companies use their Solvency II internal models in many enterprise risk management (ERM) activities. Internal economic capital models often have their roots in older pre-existing processes such as asset-liability management models or dynamic financial analysis used for aggregate exposure management. The work to expand these models into groupwide holistic economic capital models generally progressed over the last decade in preparation for Solvency II in Europe, and now ORSA and other requirements in the United States. Over time, these economic models also have become embedded in various business applications with, not surprisingly, some significant challenges along the way.

BENEFITS AND APPLICATIONS

The remainder of this article selectively overviews the range of applications in which an internal economic model has proved valuable, as well as some of the most significant challenges.

Regulatory Requirements

Around the world, economic capital work is being used to satisfy increasingly common local entity regulatory ORSA and economic balance sheet requirements in some form, including within the United States, China, Australia, South Africa and Europe. Some regulatory frameworks permit the use of an internal economic capital model as a company's regulatory capital basis. This takes significant additional work to document and justify methodologies and assumptions, but it is particularly important for companies, such as reinsurers, where standard formulas designed for direct writers don't apply well.

Common Benchmark

Multinational companies are subject to a wide variety of regulatory regimes and rating agency assessment models. These different regimes are generally not directly comparable. They also generally do not measure all risks with sufficient flexibility, granularity and transparency of underlying assumptions to use for decision-making on different products around the globe. U.S. GAAP and IFRS provide consistent accounting standards on the emergence of earnings but do not provide a common standard for evaluating relative risks.

The economic model is a primary tool in allocating capital to transactions and business lines. Risk equals capital in effective internal economic models. The economic capital model provides a common measuring stick that is used to compare and contrast risk and the risk-adjusted performance of individual transactions or entire business lines as different as property and casualty and life products.

Risk Management

Economic capital models are one of the necessary elements of a mature enterprise risk management framework for insurance and reinsurance companies. Enterprise risk management includes the identification, quantification, monitoring and steering of material risks across the organization. The common benchmark provided by a groupwide economic capital model results in a consistent approach to quantifying market, biometric, policyholder behavior, and property and casualty risks in order to consistently aggregate and demonstrate compliance with the organization's stated appetite for those risks.

It may be helpful to think of risks in terms of three categories:

1 | Core insurance and market risks taken purposefully to make a return on capital;
2 | Operational risks that must be managed within an acceptable cost level; and
3 | Strategic market and regulatory risks that the rules of the game can change.

Economic capital models, in my experience, are best applied to the core business risks, and are less useful for managing operational and strategic risks compared to other techniques.

Diversification—Input or Output?

Insurance works fundamentally by pooling and diversifying risks. The quantification of diversification effects is simultaneously one of the most challenging and valuable elements of an economic capital model. Quantifying and demonstrating the impact of diversification to internal and external stakeholders is strategically important to a multinational reinsurer that does business in markets around the world and participates in a wide range of risks.

Less sophisticated or mature economic capital models treat diversification as an *input*, i.e., as the top-down assumed correlations between different aggregate risk types. The goal of more mature economic models is to quantify diversification as an *output*, derived from bottom-up modeling of interactions and dependencies between individual asset and liability cash flows for many specific scenarios representing many combinations of risk drivers. The use of assumptions and judgment in the bottom-up approach is still inevitable, but the resulting diversification estimates can be meaningfully more credible and useful in decision-making.

Rating Agencies

At least one of the major rating agencies now gives credit to internal economic capital models that meet its published standards in its rating assessments. For example, ultimately setting the target required capital for a given rating as a weighted average of the rating agency's model and the company's internal model. The cost of capital is one of the most significant costs an insurance or reinsurance company incurs, so this can be quite valuable.

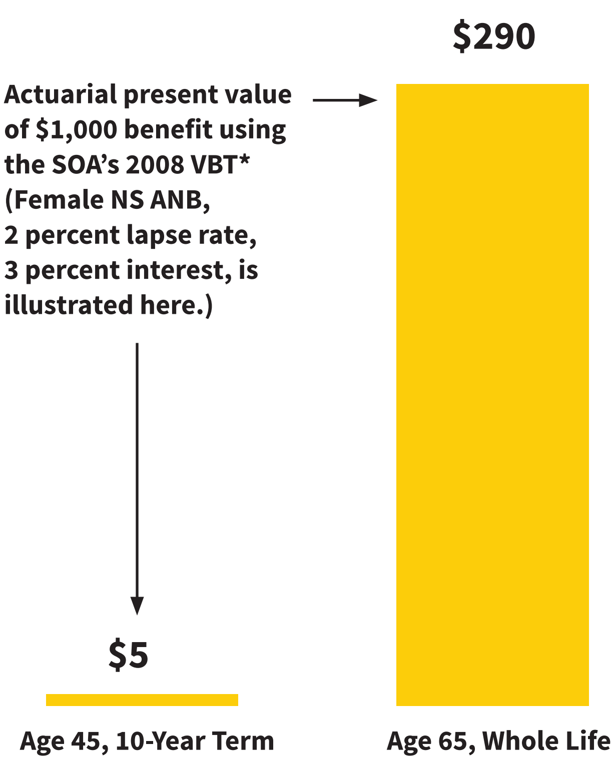
Pricing Nonproportional Risks

The internal economic capital model also plays a role in evaluating remote risk financial reinsurance solutions and other nonproportional risk covers. Internal economic capital models often use many scenarios to generate a full probability distribution of results, not just the 99.5 percent confidence level required by Solvency II. This is particularly useful for pricing and evaluating the relative attractiveness and potential losses for nonproportional risk transactions. For large bespoke financial transactions, expressing the potential risks and mitigating factors in the common language of an internal model can and does facilitate the internal review and approval process, which in a large organization can involve a significant number of internal stakeholders.

FIGURE 2 **ACTUARIAL PRESENT VALUE OF BENEFITS PER $1,000**

RISK DRIVERS MATTER

Economic risk is a function of uncertainty around economic losses. Factor-based models may not differentiate well between transactions if the risk driver is not representative of the potential variation in economic results. For example, with the same policy face net amount at risk (NAR), the present value of benefits can be more than 50 times greater. The present value of benefits is a better measure of the potential dollars at risk than a standard factor times NAR.



*Mortality table published by the SOA used here for illustrative purposes.

Retention management is another case in which an internal economic model can and has been utilized to manage nonproportional risks. The direct insurance industry looks to reinsurers to provide capacity for large individual cases or unusual risks.

Another Pricing Example—Mortality Risks Are Not All the Same

It is relevant to note that even for more traditional pricing exercises, an internal view of the economic risk and capital is important. An example from the traditional life reinsurance space illustrates the point. The U.S. regulatory and typical rating agency models assign capital as a factor times the total amount of insurance in force or exposed. These models can be viewed as appropriate for their designated purpose. However, when evaluating a specific transaction, it is important to remember that the real risk is a function of the actual dollars that could be paid out in claims. For the same policy size, the actuarial present value of claims for a whole life product issued to a 65-year-old can easily be 50 times greater than the actuarial present value of claims for a 10-year term product issued to a 45-year-old. (See **Figure 2**.)

Additionally, it is not unreasonable to assume there is greater uncertainty around the longer duration policy in both relative and absolute terms. For example, the eventual profitability of the whole life policy will be more dependent on future mortality improvement and long-term ultimate mortality developments than the 10-year term policy. The present value of expected benefits is a better measure of the potential dollars at risk than a standard factor times net amount at risk (NAR) in this case. Pricing that is based on a more dynamic economic capital basis instead of a constant factor per 1,000 can help avoid the situation where you win your losses; that is to say help avoid being the most (and/or least) competitive where you shouldn't be.

Asset-Liability Management

From a practical point of view, asset portfolio managers and actuaries do not always speak the same language. The internal economic capital model can be applied here to facilitate coordination in at least two important ways. First, the implementation of the internal model may serve as a standardized source of liability cash flows that can be used to better measure and manage asset-liability mismatches. Second, quantifying and aggregating both asset and liability risks using a common methodology and confidence measure improves holistic decision-making. This is essentially what the "E" in ERM is all about.

Management Goals—Alignment with Value Creation

The importance of aligning management's goals and compensation with long-term value creation on a risk-adjusted basis is commonly understood. Regardless, to the extent there is no or little link between management goals and compensation and a company's internal economic model, I believe it is safe to say either the model is still immature or there is a potential gap in the company's stated view of economic risks and management's incentives.

External Investor Relations

It is not uncommon for insurance companies to utilize an embedded-value-reporting basis, including both new business and the change in the value of in-force business, as one element of value measurement for internal and external purposes. This is more commonly reported to external investors by international companies but may be reported externally by U.S.-based groups as well. It now appears likely in Europe that many companies will replace their current embedded value reporting with generally equivalent value measurement from their Solvency II reporting—perhaps with modifications to the prescribed Solvency II cost of capital and capital allocation requirements. It obviously is helpful to communicate a clear strategy for deploying shareholder capital to generate returns on a risk-appropriate basis.

CHALLENGES

The potential benefits and applications of an internal economic capital model do come with significant costs and challenges, including:

Balancing Regulatory and Commercial Interests

One significant challenge is the inherent conflict between regulatory and management purposes. In any area of evolving products or markets, it is naturally in the regulators' interest to err on the side of conservatism. For those actuaries practicing within a company's own management, however, there is an obligation to pursue the shareholders' commercial interest simultaneously with securing the policyholder obligations.

One way to balance this is to clearly separate within the economic capital model best estimate liability values and the capital and liability margins for risk. Then the actual dollar amounts of the provisions for risk and uncertainty are transparent. As an example, this is not transparent in current GAAP or IFRS reporting for insurance contracts, as the final dollar amount of the provisions for adverse deviations in valuation assumptions is not easily visible to internal stakeholders or external investors.

Market Volatility Versus Long-Term Nature of Insurance Contracts

One of the primary purposes of an economic capital model is to provide transparency to management and stakeholders of the current inherent net value and adequacy of assets over liabilities. However, the financial markets are notoriously volatile. One of the primary benefits that long-term insurance contracts provide to society is increased certainty and security when it is needed the most. Under immense pressure from industry, a volatility adjustment option was included in Solvency II late in the game to partially offset asset mark-to-market within liability discounting. Regardless, many would argue that significant volatility inappropriate to the long-term nature of liabilities is still likely. This is a difficult issue with vocal proponents and critics on both sides. There's no current consensus, but one potential tool would be to clearly separate realized versus unrealized changes in value when quantifying and explaining results. By unrealized changes, I'm referring to future results that have not yet materialized or been crystalized and potentially can still be influenced by management action.

Black Box Syndrome

If the model and results are not clear, understandable and actionable, then management and other stakeholders cannot and will not rely on the conclusions for decision-making. It can take years to overcome this kind of "black box syndrome" hurdle. It is incumbent on the actuaries and other experts involved in developing and implementing an internal economic capital model to resist the urge to add unnecessary complexity. The importance of presenting and communicating the methodologies and results in a clear way to address actual business issues, provide context for existing management metrics, and support existing corporate goals and strategy cannot be overstated.

Logistics and Operational Complexity

It probably goes without saying that a groupwide internal economic capital model for a large multinational organization is a logistical and operational challenge. Inputs and computations are needed from across the organization for assets, liabilities and various interactions. The best advice that comes to mind is Albert Einstein's admonition to "make things as simple as possible, but no simpler." Consider ways to start with existing questions and needs, and then plan ways to grow systematically but organically from there. In the long run, the tool will

The economic capital model provides a common measuring stick that is used to compare and contrast risk and the risk-adjusted performance of individual transactions or entire business lines as different as property and casualty and life products.

> “The importance of presenting and communicating the methodologies and results in a clear way to address actual business issues, provide context for existing management metrics, and support existing corporate goals and strategy cannot be overstated.”

be more useful and practical to the extent it is embedded and aligned with existing processes and people.

Remember What It Is Not

Especially for those closest to the economic capital model, it is important to remember what it is not. Regardless of the sophistication, it's just a model and we must ultimately remember that no map should be confused with the actual territory. Even the best economic capital models are blunt instruments in many cases, appropriate at a block or entity level but not always appropriate for individual transactions or specific situations. Economic capital models are usually not as effective as other techniques for managing liquidity and collateral related risks. Liquidity is pass-fail; you either have it when you need it, or you don't. Regulatory, commercial and other rating constraints are both real and critically important. Finally, techniques will continue to evolve and no model can necessarily quantify the range of all possibilities.

CONCLUSION

Economic capital modeling capability appears to be moving quickly from an emerging area of practice to an expected industry standard. A combination of commercial and regulatory developments is driving this trend. There is a range of applications as well as challenges that need to be carefully considered. The real opportunity to add value to the business, clients and policyholders makes this an exciting time to be practicing as an actuary in economic capital, risk management and related areas. ■

Clint Thompson, FSA, MAAA, is senior vice president and chief risk officer at Hannover Life Reassurance Company of America in Orlando.

clint.thompson@hlramerica.com

GEN Y

SUBJECT: BRADLEY
BORN: 1983
RESIDENT: NASHVILLE, TENNESSEE
OCCUPATION: MANAGING EDITOR

PROTECTING BRADLEY

LIFE INSURERS CAN DO A BETTER JOB OF MAKING LIFE INSURANCE MORE RELEVANT TO MILLENNIALS

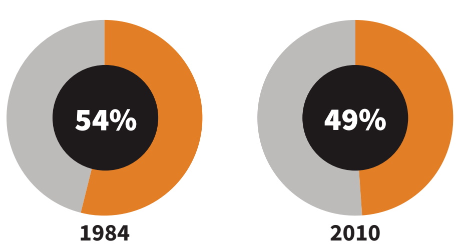
BY STEPHEN ABROKWAH

Demand for mortality protection is closely tied to life cycle. At the early stages of adult life, the need for income protection rises as people finish their education, start a job, get married, buy a house and have children. In a few coming years, the millennials—those born between 1981 and the late 1990s—will be the segment with the largest need for mortality protection. Swiss Re's research shows that in 2010, both the protection needs and the protection gap were the largest for families headed by 35- to 44-year-olds—the age group that will consist of the millennials over the next decade. Millennials today are still underserved, however, contributing $4.9 trillion of the $20 trillion protection gap as of 2010.[1]

The mortality protection gap spans across both employer-provided (group) and individual coverage sources. Ownership of life insurance has declined at an alarming rate and currently stands at a 50-year low, according to a LIMRA study.

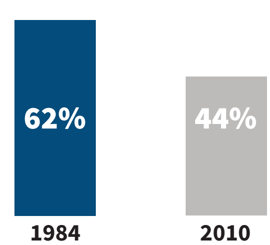
HOUSEHOLDS WITH EMPLOYER-PROVIDED GROUP TERM LIFE INSURANCE

Employer-provided group term life insurance was available to only 49 percent of households in 2010, compared to 54 percent in 1984. In addition to the declining proportion of families with coverage, a current study shows that the amount of group coverage is also inadequate.



HOUSEHOLDS WITH INDIVIDUAL LIFE INSURANCE

On the individual side, coverage fell from 62 percent of families in 1984 to only 44 percent in 2010. Relating it to millennial households, half of them have group life insurance coverage alone, while 23 percent have some individual life coverage.[2,3]



With a population of 85 million, millennials are the largest age cohort of the U.S. population with the highest share (35 percent) in the working age population (see **Figure 1**). Compared to earlier generations, millennials are better educated—especially women—and are more ethnically diverse. For example, approximately 61 percent of adult millennials have attended college, whereas only 46 percent of baby boomers did so.

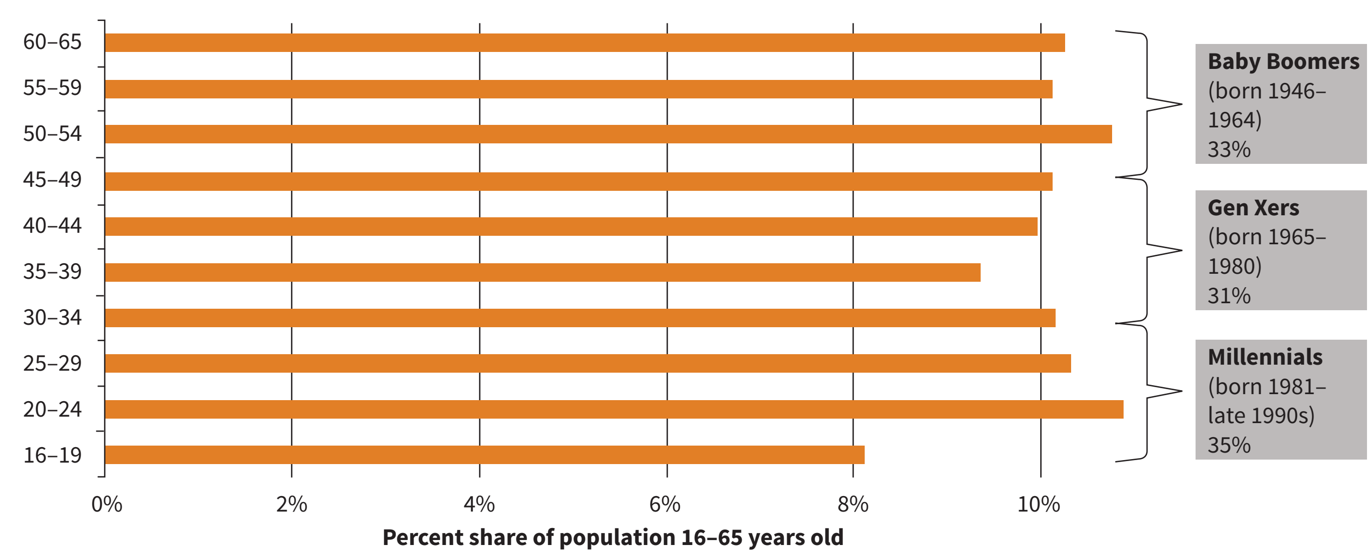
They're most open to change and are more connected. They are also "digital natives," as technology has always been present in their lives. Thus, they're the most avid users of the Internet and mobile devices, and most active on social media networks. Nearly a quarter of millennials say that their generation's unique and distinctive identity is tied to their use of technology.[4] As shown in **Figure 2**, millennials spent over 400 billion minutes on the Internet in 2014 alone, compared to Gen Xers, who recorded a little over 200 billion minutes of Internet usage.

The economic characteristics of the millennial generation are also different, as they still carry the scars of the latest recession. The oldest millennials were in their late 20s during the economic recession, when unemployment levels kept rising with decreasing levels of income. Succeeding years of millennials faced a difficult employment market just as they were graduating from college. The average earnings of persons under age 35 relative to all families fell from 61 percent in 2007 to 56 percent in 2013, as they started their careers in a weak labor market with flat or lower average starting salaries, got modest raises and had higher rates of underemployment.[5] This experience has greatly molded their financial and economic decision-making process.

Moreover, millennials are entering adulthood with record levels of student debt.[6] For example, there was an approximate 70 percent increase in student loan borrowers from 2004 to 2012, and about 52 percent of millennials claim that student loans are their biggest financial concern (see **Figure 3**). In the event of the death of a millennial with student debt, the responsibility for that student's loan transferring over can be unmanageable or financially devastating for the student's co-signer. A life insurance policy might be a good option to provide some peace of mind. Additionally, a good proportion of millennials are currently out of school and in the workforce, and hence liable for these debts.

Despite their personal debt, millennials are surprising long-term optimists, which explains their willingness to keep their money in tracking Exchange Traded Funds (ETFs).[7] More than 8 in 10 say they either currently have enough money to lead the lives they want (32 percent) or expect to in the future (53 percent).[8] This might be an avenue for life insurers to educate and market to millennials not only on the need for protection, but also for financial planning.

FIGURE 1 **AGE GROUP SHARE OF WORKING POPULATION, 2013**



Source: U.S. Census, Swiss Re Economic Research & Consulting

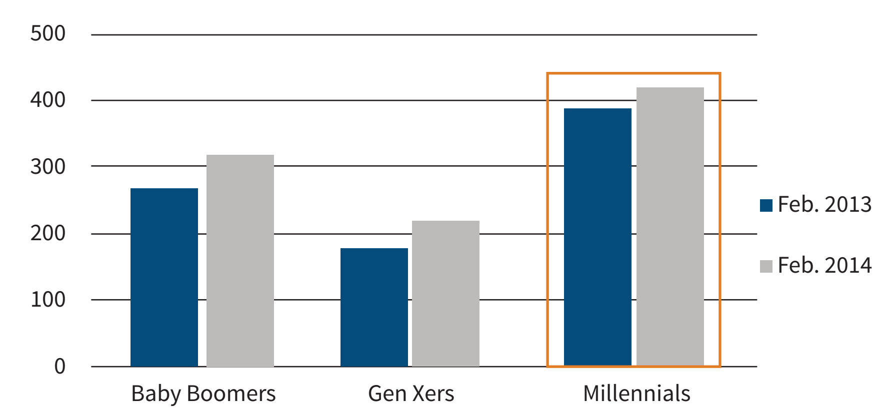
Reaching the millennials to help them address their protection needs is a huge opportunity for insurers. Life insurers need to understand the characteristics and expectations of this generation in order to successfully engage with them. The fact is that millennials have the most to gain—they're most likely healthy and will qualify for lower premium rates for life insurance coverage when they apply early in life. As it stands today, millennials aren't being reached in the right way—they're digital natives, yet most life insurers are still using traditional broker and agent channels to reach their consumers.

Life insurers can do a better job of making life insurance relevant for millennials. This generation typically identifies with products that fit their lifestyles, and as the current industry stands, it's difficult for them to understand the importance of life insurance protection. Technological developments, the spread of the Internet, and social media have strongly influenced consumer preferences and buying behavior, especially of millennials. They've grown to expect easy and quick access to information in their commercial interactions, transparency about cost and value, and high-quality services. They're savvy in their buying practices, invest time to research and compare options online, and seek the fastest and easiest ways to make the most cost-effective purchases.[9]

Selling and buying life insurance is challenging for many reasons. In the current economic environment, many families still face budget constraints that limit

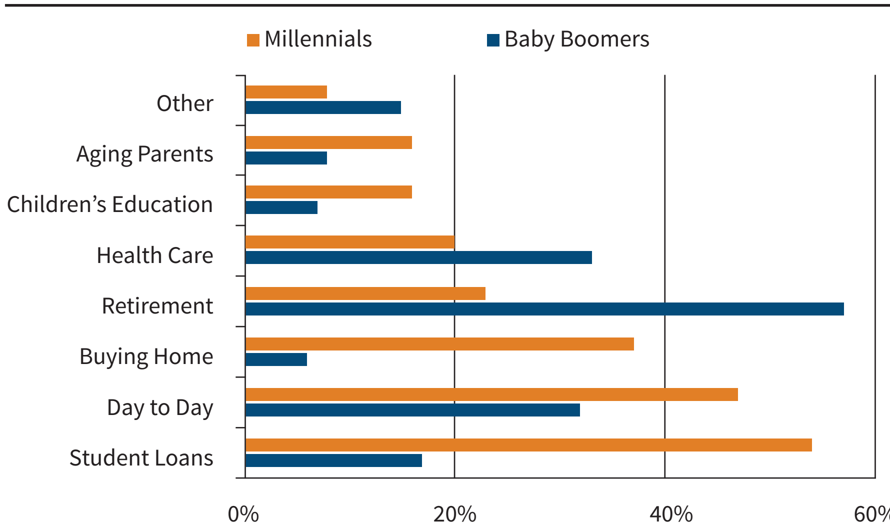
> "Millennials face more economic challenges than previous generations, and cite student loan debt as their biggest financial concern."

FIGURE 2 **ANNUAL MINUTES ON INTERNET (IN BILLIONS)**



Source: *U.S. News Millennial Report*, 2014

FIGURE 3 **BIGGEST FINANCIAL CONCERN FOR MILLENNIALS**



Source: *U.S. News Millennial Report*, 2014 demand due to stagnant or declining real income. Familiarity with life insurance and perceptions of need are also a hurdle. Unlike other types of insurance such as home and auto, the purchase of life insurance is discretionary, and as such doesn't stack up high in the hierarchy of perceived needs.

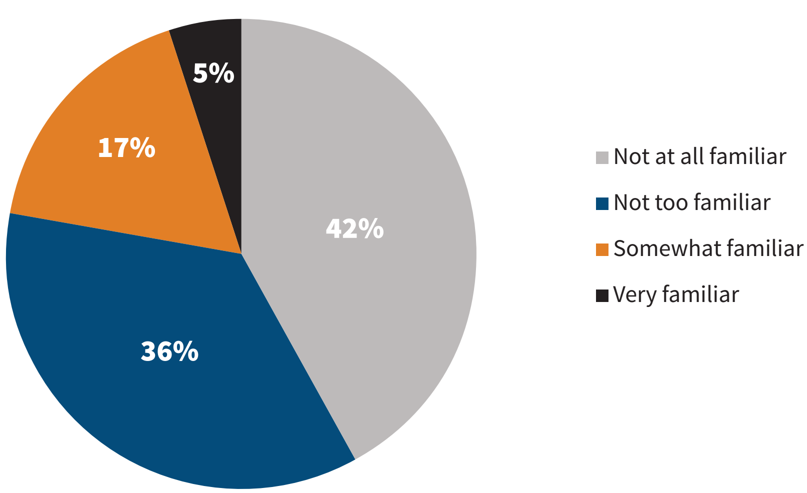
According to LIMRA's 2015 Insurance Barometer Study, many millennials place more importance on purchasing technology, eating out and shopping over buying life insurance. Millennials aren't familiar with the insurance industry[10] and don't understand why life coverage is relevant in their lives. Only 5 percent say they're very familiar with the concept of insurance (see **Figure 4**). Also important are powerful psychological and behavioral biases, which tend to hinder "rational" decision-making when it comes to making complex decisions such as the purchase of life insurance.[11]

The life insurance industry has fallen behind many other industries in meeting customer expectations in the digital age. Much needs to be done to improve the customer experience and to make the buying of life insurance simple, convenient, non-invasive and pleasant. Life insurers need to simplify products where possible and streamline underwriting and selling procedures, making use of big data and predictive analytics tools to complement the protective value of the traditional underwriting process. Utilizing predictive modeling techniques to develop an analytics-based approach to underwriting can result in better, faster and more efficient business decision-making. It is clear that other industries—such as property and casualty and banking, among others—have taken the lead in incorporating predictive analytics as part of their core business processes to improve their decision-making.

The gains from utilizing predictive analytics tools clearly include shortening turnaround times of the buying process; reducing the cost of underwriting and, ultimately, insurance premiums; and reducing the current invasiveness of underwriting. These are improvements from which both the insurer and every prospective policyholder will ultimately benefit, but even more so the millennial generation that has particularly identified these concerns as the pain points of its insurance buying experience. See the sidebar on page 33 for a detailed discussion on predictive analytics in the life insurance process.

Digital technology provides huge potential to transform the life industry and make it more consumer-centric. Technology now allows for end-to-end contact between insurers and customers on mobile platforms, especially for the relatively simple and standardized products that younger adults need the most. The spread of wearable devices has opened opportunities to engage consumers and build long-term relationships by motivating and rewarding healthy behaviors. Data collected in real time will become increasingly relevant in risk measurement and assessment, and may radically transform underwriting. Advances in big data and cognitive computing promise to lead to the development of new tools for digital advice and personalized product and coverage recommendations.

FIGURE 4 MILLENNIAL FAMILIARITY WITH THE INSURANCE INDUSTRY



Source: *U.S. News Millennial Report*, 2014

> Life insurers need to understand millennials' preferences and buying behaviors, and adapt to them."

PREDICTIVE ANALYTICS IN THE LIFE INSURANCE PROCESS

Predictive analytics is basically the analysis of large data sets (big data) to make inferences or identify meaningful relationships, and the use of these relationships to better predict future events. Predictive modeling tools have the potential to enable insurers to address some of the concerns resulting in the low penetration of life insurance among millennials—complex and invasive underwriting process, costly and time-consuming process from time of application to when a policy is issued, etc.

While life insurers are noted among the users of statistics and data analytics, they clearly have not integrated predictive analytics to improve the insurance buying process in the same way that other businesses (e.g., property and casualty, banking and marketing) have. The property and casualty industry, for example, utilizes generalized linear models, credibility techniques and, more recently, credit scoring models as part of its modeling techniques for driving business decisions.

Life insurance plays the important role of protecting households and individuals from the financial effects of uncertain mortality. Over time, life actuaries have developed good estimates of life expectancy in the form of mortality tables that mirror aggregate insured population mortality, while underwriting techniques assist in assessing the relative risk of an individual. Though these traditional techniques have been widely accepted across the industry, the standard life insurance underwriting process is still time-consuming and quite costly.[12] A typical life insurer spends about a month and several hundred dollars underwriting each applicant, which clearly translates into higher insurance premiums.

In response to some of these long-standing concerns, the life insurance industry has clearly made efforts toward streamlining some of the underwriting and sales processes. A number of these improvements include simplified applications for smaller face amounts and the refinement of underwriting requirements based on protective value studies.

Though these are good efforts toward a more robust and streamlined life insurance sales and underwriting process, there's clearly more to be done to embrace the revolution in predictive analytics and business intelligence. Property and casualty insurers are further along in developing analytics-based approaches to underwriting for better, faster and more efficient decision-making. Studies have shown that the life insurance industry is actually at the point where predictive modeling should be utilized more in its sales, underwriting and customer retention processes.[13] The good news is that a few life insurers are beginning to explore the possibilities of using predictive modeling and automated life underwriting in their business processes,[14] and we only expect the numbers to increase over time.

The late arrival of the life insurance industry on the scene was a result of a number of modeling challenges, which include the target model variable and the volume of data required for modeling. Because life insurance is mostly sold through long-duration contracts (e.g., 20 or 30 years, or even over the lifetime of the policyholder), it makes it difficult to have a clearly defined target variable. There's also the possibility that some of the risk factors predicting mortality might change over time.

Also, life insurance claims usually have low frequency per year, and this poses significant challenges to modeling. Unlike for auto insurance, where approximately 10 percent of drivers make a claim per year, life insurers can typically expect about one death in the first year per 1,000 policies issued,[15] making it very difficult to model any statistically significant variation in mortality.

To work around these challenges, a number of life insurers are beginning to work with a closely related and yet more immediately viable proxy target variable—the underwriting decision on a new policy issued having characteristics that address both concerns of modeling mortality.

Though costly and time-consuming, underwriting plays an important role in the life insurance process. To be able to generate more value from this process and break the barriers preventing enough penetration among the millennials, predictive modeling can be used to provide a streamlined process to give an early indication of the likely underwriting result. Thus, predictive modeling can be utilized not to make the final underwriting decision, but rather to triage applications and provide suggestions as to whether additional requirements are needed before making an offer.

MILLENNIALS ARE MORE EDUCATED, DIVERSE, OPEN TO CHANGE AND CONNECTED BY TECHNOLOGY THAN PREVIOUS GENERATIONS.

DISTRIBUTION CAPABILITIES

Distribution channels have been evolving over time with new technology and the Internet. Companies must adapt their distribution strategies quickly and take advantage of new technologies that allow for speedy and interactive ways to engage consumers online and via mobile, communicate more effectively and foster long-term relationships with their customers.

A good example is MetLife expanding into traditional brick-and-mortar stores (Wal-Mart) to sell life insurance from a kiosk. Even large technology and retail companies like Google and Amazon are partnering with insurers as retailers. Distribution has become a source of competitive advantage for life insurers. This process will create value for consumers of all ages, but it is especially vital for reaching the younger generations for whom the traditional methods of risk assessment, underwriting and selling life insurance products are an enigma.

Although innovation is already underway, it is still in an emerging stage. For example, John Hancock and the Vitality Group partnered recently to create an interactive wellness program whereby wearing a Fitbit and sending information seamlessly to their insurer, participants can earn rewards throughout the year by reaching their wellness goals. They've made healthy living a part of life insurance. This model of wellness and life insurance has been in place in other markets, particularly in South Africa where the Vitality Group has a partnership with Discovery Insurance to provide rewards and incentives to its policyholders.

Mass Mutual established Haven Life, an insurance agency that enables customers to apply for and receive term life insurance entirely online. Oscar Life, a health insurer, has created an app that compiles a comprehensive history of an individual's health, including doctor's visits and prescriptions, as well as providing fitness trackers for its patrons. These are all examples of how investing in technology is key to reaching younger consumers. The opportunities to build long-lasting relationships from early adulthood are huge for companies that successfully adapt their business models to engage them.

"Ultimately, predictive analytics tools help reduce the invasiveness and turnaround time of the underwriting process."

CONCLUSION

Market trends show that life insurance coverage continued to decline from 2010 to 2013. Over the next 10 years, the millennials will be 35- to 44-year-olds—spanning the time in adult life during which mortality protection needs are the highest and the protection gap has historically been largest.

The preferences and expectations of this large demographic group will define the future of the industry. Their behaviors have been shaped by use of technology from a very early age, and in order to reach and engage with them, life insurers need to radically transform traditional practices and carry out efforts to make life insurance more relevant. Technology will inevitably play a key role, and early adopters will have a significant competitive advantage.

The advent of more advanced technology—cognitive computing, big data and predictive analytics—is transforming the insurance industry. Life insurers need to embrace the use of predictive analytics in their business decision-making process, given that it has the ability to help shorten turnaround times, reduce the cost of underwriting and reduce the current invasiveness of underwriting. ■

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[2] LIMRA, Household trends in U.S. Life insurance ownership, 2010.
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[4] Pew Research Center, How millennials today compare with their grandparents 50 years ago, *pewrsr.ch/1x4rsjT*.
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[7] Pew Research Center, Millennials in Adulthood; The Stunning Evolution of Millennials: They've become the Ben Franklin Generation, *huff.to/1Fa6eEx*.
[8] The Stunning Evolution of Millennials: They've become the Ben Franklin Generation, *huff.to/1Fa6eEx*.
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[10] The Griffith Insurance Education Foundation and The Institutes, Millennial generation attitudes toward work and the insurance industry, 2012.
[11] Swiss Re, sigma, Life insurance: focusing on the consumer, June 2013, offers a detailed discussion on why consumers don't buy life insurance.
[12] According to the Deloitte 2008 Life Insurance Operations Expense Study (LIONS) benchmarking study of 15 life insurers, the median service time to issue a new policy ranges between 30 and 35 days for policies with face amounts between $100,000 and $5 million, and the average cost of requirements (excluding underwriting time) is $130 per applicant.
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[14] An SOA sponsored study in 2009, Automated Life Underwriting, states that 1 percent of North American life insurers surveyed are currently utilizing predictive modeling in their underwriting process.
[15] This is an estimate based upon industry mortality tables. Mortality experience varies across companies with insured population demographics. In the 2001 CSO table, the first-year select, weighted average mortality rate (across gender and smoker status) first exceeds one death per 1,000 at age 45.

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THE TRUE COST OF COVERAGE

LET'S TALK ABOUT THOSE ACA SUBSIDIES AGAIN AND UNDERSTAND THEIR IMPACT ON INDIVIDUAL RATES

BY GREG FANN

AUTHOR'S NOTE: The views expressed herein are those of the author alone and reflect current information as of September 2015. They do not represent the views of the Society of Actuaries, the author's employer or any other body.

A more detailed examination of the technical components discussed in this article, along with some suggestions on how actuaries can contribute to the public good by correcting simplified explanations and common misconceptions, was published in the May 2014 edition of *Health Watch*;[1] insights, language and numerical examples from the *Health Watch* article are included in this article.

It was not a slow news day. America awoke on July 22, 2014, to growing foreign and domestic problems on multiple fronts. Evidence was mounting that pro-Russian separatists in eastern Ukraine were responsible for a sophisticated surface-to-air missile attack on a commercial Malaysian flight from Amsterdam. Israeli attacks on Hamas continued to dismantle the tunnel warfare infrastructure in the Gaza Strip. A swiftly emerging and dangerous terror group had just burned a church in Mosul, Iraq, and threatened remaining Christians to leave the region, creating a mass humanitarian crisis in the process.

Closer to home, government leaders were trying to find a solution to an unprecedented influx of unaccompanied migrant children crossing the southern border. As reporters struggled to stay current with the various volatile situations, many commentators were making the unusual case for President Barack Obama to adjust his short-term schedule, which included multiple events deemed to be unofficial business. It was an unusually chaotic day in the midst of an already busy news cycle.

Absent from the fractured dialogue—and seemingly forgotten—was discussion of the 2014 health insurance market changes prescribed by the centerpiece legislation of the Patient Protection and Affordable Care Act (ACA), which had been prominent in the front page and political news cycle since 2010. With some of the more potent controversies quelled, the daily ACA news updates began fading in the spring of 2014. After the final tallies were in for the initial enrollment period, there was little else to report until 2015 premium rates were released.

Despite the widely publicized glitch in the rollout of health exchanges in November 2013, the national criticism had quieted after technical fixes were applied to exchange websites, an extension of the enrollment deadlines was implemented (coupled with successful promotion efforts), and delays or relaxations were granted to some of the more criticized policy elements.

With the exception of a Supreme Court decision in June dealing with employee health benefits and religious liberty of closely held corporations, prominent news discussion of the ACA was waning and being crowded out by ostensibly more urgent matters.

The news hit the wire about 10 a.m. on the East Coast, and it seemed to catch everyone by surprise. A three-judge panel of the D.C. Circuit Court, generally regarded as the second-highest court in the land, had ruled that the Internal Revenue Service (IRS) had broadened the ACA language "an Exchange established by the State" to also include fallback exchanges established by the federal government (in states that did not establish an exchange) with regard to the issuance of government subsidies (technically "tax credits") to assist individuals with health insurance premiums and benefit cost sharing. Less than two hours later, a three-judge panel in the 4th Circuit ruled nearly the opposite.

ACTUARIES SHOULD PLAY A LEADING ROLE IN EDUCATING THE PUBLIC ABOUT RELEVANT TECHNICAL MATTERS SUCH AS HOW THE ACA SUBSIDIES ACTUALLY FUNCTION.

America was suddenly talking about the ACA again. With split appellate court decisions on a weighty matter, speculation of Supreme Court interest naturally entered the discussion.[2] Legal pundits were arguing the importance of literal language versus "overwhelming intent" of enacted legislation. News organizations were sifting through old transcripts and video reels looking for a smoking gun on what exactly congressional intent was, although it seemed evident to some that these details were beyond the scope of understanding of the average member of Congress at the time the legislation was considered. At home, Americans watched as various midday news anchors appeared to be reading transcripts and trying to decipher the content as they read, reminiscent of the 2012 Supreme Court ruling regarding the "individual mandate" and the requirement of states to expand their Medicaid programs.

While the 2012 Supreme Court decision generally upheld the ACA, Medicaid expansion was dealt a minor blow as individual states were given the option to expand Medicaid eligibility or not. A Supreme Court ruling similar to the D.C. Circuit Court, on the other hand, would likely be disastrous for the ACA in states that did not establish their own exchanges. The logic goes something like this: If low- and middle-income enrollees (87 percent of market) are not eligible for subsidies, health insurance becomes "unaffordable," which negates the individual mandate tax penalty. Without the so-called carrot (the subsidies) and stick (the tax penalty), the incentive to purchase insurance is dramatically reduced for subsidy-eligible individuals in federal exchange states.

findings

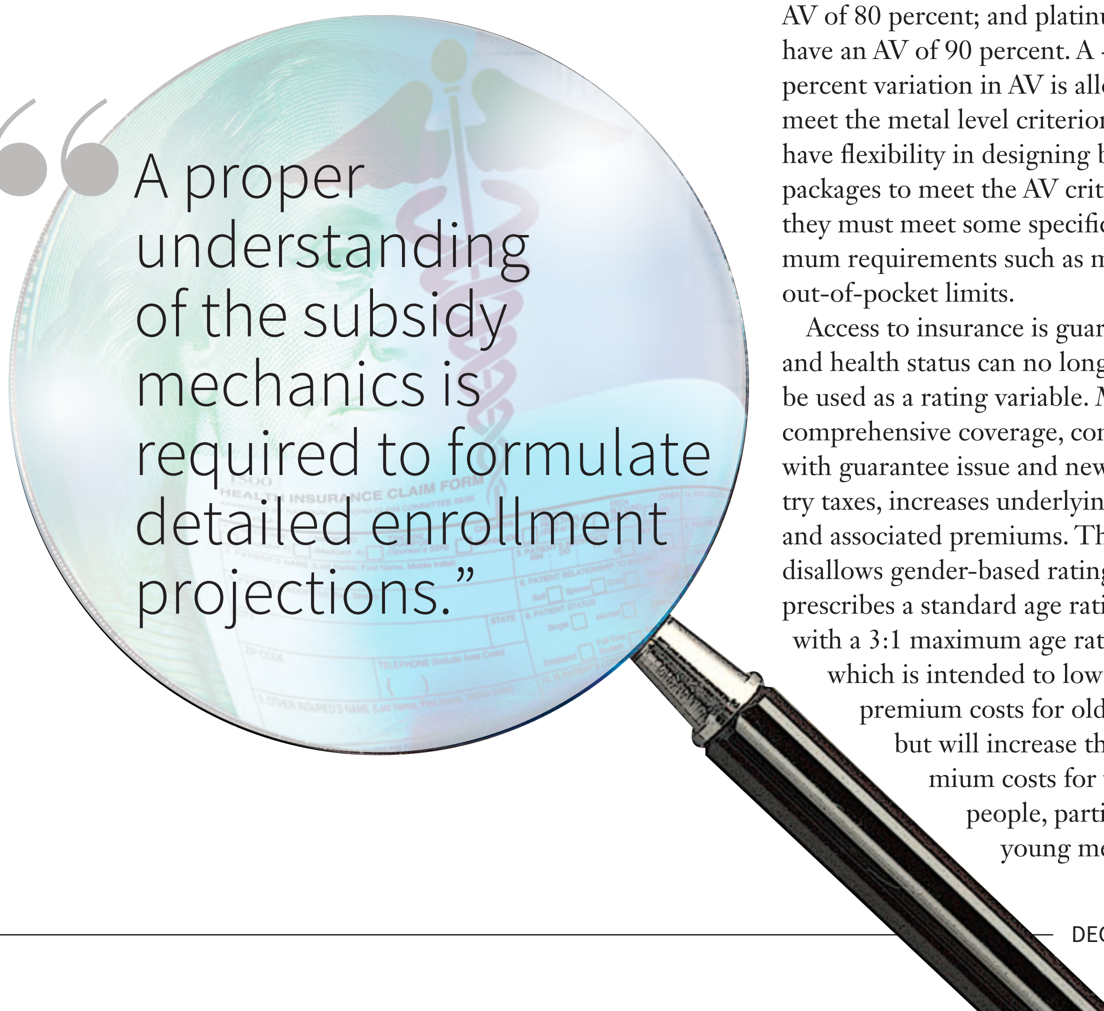
BEFORE THE ACA

Prior to the Affordable Care Act, benefits and rates for individual coverage varied substantially by state and issuer. In many states, issuers developed unique benefit designs, set their own rating factors, and may have considered underwriting factors for health status and claims experience in determining the premium rates offered to an individual purchaser. Under the ACA, individual rates may vary only for benefit plan, age, geographic area, family members covered and tobacco use. All issuers must use the same age factors as prescribed by the state. The state determines the geographic regions and may define parameters for developing area rating factors.

The near simultaneous and opposite court decisions not only brought the ACA discussion back into the public arena, but heightened awareness of the importance of the subsidies to the overall framework of the law. Unfortunately, since the law's inception, general discussions of subsidies, even among experts, have sometimes misrepresented the inherent mathematical ramifications for individual consumers with vague explanations.

In fact, supporting comments for market viability often specifically claimed that "young people would enroll in exchanges due to generous subsidies." Many young people did respond to an aggressive marketing campaign and purchased health insurance for the first time, but the math indicates that the subsidy distribution is dramatically tilted toward older people. The 18–34 demographic represented 28 percent of the market at the end of the 2014 open enrollment, short of the 39 percent targeted expectation; the results are similar for 2015, and anecdotal evidence indicates attrition later in the year may have particularly affected a younger demographic.

Following the early misconceptions regarding subsidy allocations by age, the prevailing tale in 2015 and 2016 may be that "subsidies will partially offset rate increases." This is true, but only for a minority of subsidy-eligible policyholders who have purchased richer benefit coverage. In reality, many people with exchange coverage will actually see their net premium rates decrease due to rate increases as the federal government's share of the cost increases. This paradox is illustrated later in this article.



> "A proper understanding of the subsidy mechanics is required to formulate detailed enrollment projections."

AN UNDERSTANDING OF THE ACA IMPACT ON INDIVIDUAL RATES

The ACA includes several provisions that impact gross premium rates, rate relativities and net costs paid by individuals. The benefit and rate provisions apply to all individual coverage offered through exchanges or purchased directly from issuers. The ACA generally enhances benefits and attempts to standardize health care coverage by requiring compliant plans to meet an actuarial value (AV) criterion, which is the average value of the plan benefits relative to the total allowed costs based on a federally prescribed model. This allows consumers to compare benefit values across issuers and is intended to increase price transparency.

Plans must meet "metal level" AV requirements. Bronze plans have an AV of 60 percent; silver plans have an AV of 70 percent; gold plans have an AV of 80 percent; and platinum plans have an AV of 90 percent. A +/–2 percent variation in AV is allowed to meet the metal level criterion. Issuers have flexibility in designing benefits packages to meet the AV criterion, but they must meet some specific minimum requirements such as maximum out-of-pocket limits.

Access to insurance is guaranteed, and health status can no longer be used as a rating variable. More comprehensive coverage, combined with guarantee issue and new industry taxes, increases underlying costs and associated premiums. The ACA disallows gender-based rating and prescribes a standard age rating curve with a 3:1 maximum age rating limit, which is intended to lower the premium costs for older people but will increase the premium costs for younger people, particularly young men.

The rate impact obviously varies by age and gender, and may create a market with higher premiums than before for young people, all else being equal. President Obama's announcements that allow for further extension of pre-ACA benefits preserved the pre-ACA age and gender rating structure for individuals and groups in states, and with issuers that elected this extension option. Hence, it is likely that younger people insured before 2014 and rated on a steeper age curve will have a greater propensity to keep their current plan than older people.

The ACA offsets some of the upward force on premiums by creating penalties for those not retaining adequate insurance, as well as through encouraging healthier people to enroll by providing premium and benefit subsidies to some based on income levels if they purchase coverage through an exchange. As results vary significantly by age, an understanding of the subsidy mechanics is important to understand enrollment ramifications and, ultimately, the long-term implications of the ACA on the individual market.

PREMIUM SUBSIDY ILLUSTRATIONS

A simplified but lengthy example was constructed in the *Health Watch* article to illustrate the net premium and cost-sharing impacts segmented by age, benefit plan and income level. Three individuals of different ages were assumed to represent a sampling of the population. Similar examples are used below to illustrate the impact of 2015 rate changes.

FIGURE A illustrates a sample 2014 gross premium structure for individual health coverage before premium subsidy reductions for three individuals before and after the ACA. The sample premiums reflect the federal age curve and reasonable pricing assumptions. (Note: This example assumes health insurance was purchased prior to ACA, so that the given individuals had a choice of renewing on their pre-ACA plan or purchasing an ACA-compliant plan. The current plan has a 50 percent actuarial value, and while the illustration reflects different rates for the current—also referred to as "transitional" or "grandmothered"—plan due to benefits and age slope, it does not reflect that rates may also be relatively lower due to preferred

FIGURE A MONTHLY PREMIUM OF SECOND-LOWEST CARRIER

Age	Current	Bronze	Silver	Gold	Platinum
24	$93.75	$198.03	$231.03	$264.04	$297.04
44	$234.38	$276.64	$322.75	$368.86	$414.96
64	$562.50	$594.08	$693.09	$792.11	$891.12

FIGURE B MAXIMUM PREMIUM CONTRIBUTION

FPL Level	Maximum Percent of Income
100–133%	2.00%
133%	3.00%
150%	4.00%
200%	6.30%
250%	8.05%
300–400%	9.50%

underwriting status at the time the policy was issued prior to 2014. This example also shows only a single plan for each metal level. Most individuals will have a choice of issuers, plans and rates for each metal level.)

The premium subsidy calculation varies by individual. **FIGURE B** displays the first input to the premium subsidy calculation as prescribed by the ACA. Depending on income relative to the Federal Poverty Level (FPL), an individual's contribution (that is, net premium) is capped based on the benchmark plan (the second-lowest cost silver plan available to that individual on the exchange) available to an individual of his or her age and in his or her geographic region. As mentioned earlier, premium subsidies are not available to individuals with incomes below 100 percent of FPL or above 400 percent of FPL; applicable percentages are linearly interpolated in between the data points in Figure B.[3]

FIGURE C illustrates the ACA premium subsidy calculation for each individual age. For an income level of 275 percent FPL, the monthly contribution per individual regardless of age is capped at $231.06 ($11,490 * 275 percent * 8.78 percent / 12). As the benchmark plan (assumed to be the silver plan illustrated) rate is lower than the maximum contribution, the 24-year-old is not eligible for a premium subsidy. The older individuals can purchase the second-lowest silver plan for the maximum contribution, or apply the calculated subsidy to purchase another lower or higher cost plan in the exchange offered by any issuer. While this is only one example, and not an exhaustive study, this example demonstrates that the calculation results in higher subsidy dollars for older people with the same income, simply because their rates are higher than younger people.

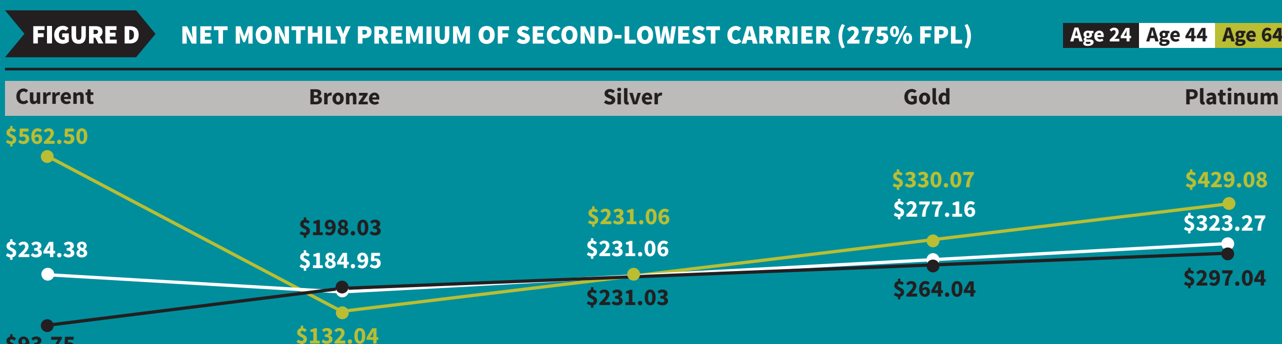
FIGURE D illustrates the net premiums available to an individual at the 275 percent FPL level after subtracting the premium subsidy from the monthly premium. A few things should be noted from the resulting net premiums. First, the rates for the current plans have not changed from Figure A to Figure D, as these plans are not ACA-compliant and therefore not eligible for federal subsidies. The same would be true for individuals

FIGURE C PREMIUM SUBSIDY CALCULATION (BENCHMARK PLAN)

Age	FPL Amount*	FPL Level	Maximum Percent of Income	Benchmark Plan (B)	Maximum Contribution (M)	Calculated Subsidy (greater of (B−M) and zero)
24	$11,490	275%	8.78%	$231.03	$231.06	$0.00
44	$11,490	275%	8.78%	$322.75	$231.06	$91.69
64	$11,490	275%	8.78%	$693.09	$231.06	$462.04

*2013 Amount

FIGURE D NET MONTHLY PREMIUM OF SECOND-LOWEST CARRIER (275% FPL)



VARYING PREMIUM RATES

Notably, the net premium rates vary by income level as lower income leads to a higher subsidy level and more leverage to the net premium rates as illustrated in Figures D' and D".

FIGURE D' SECOND-LOWEST PLAN NET PREMIUM CALCULATIONS (200% FPL INCREASE) Age 24 Age 44 Age 64

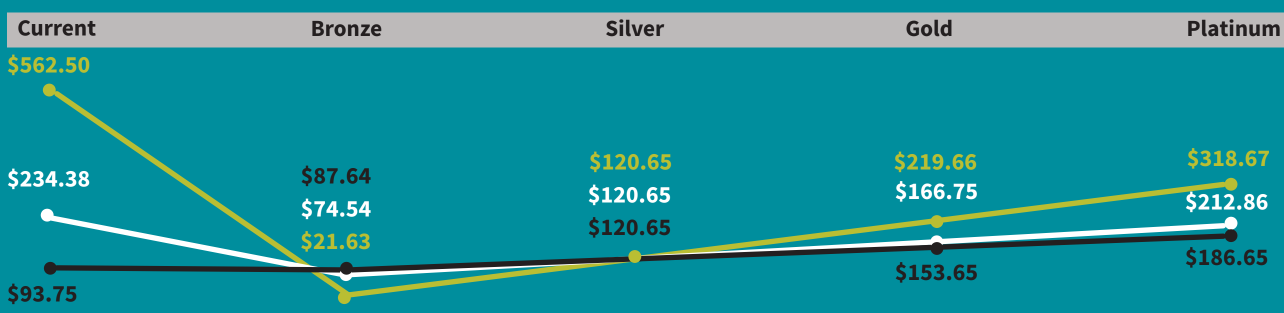
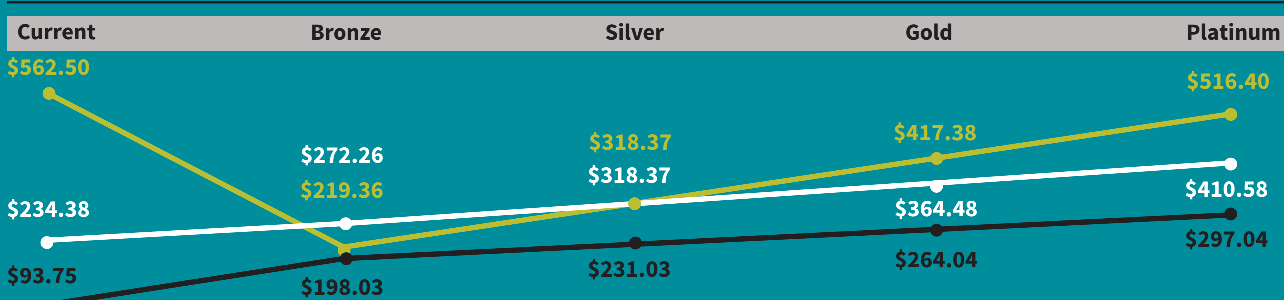


FIGURE D" SECOND-LOWEST PLAN NET PREMIUM CALCULATIONS (350% FPL) Age 24 Age 44 Age 64



with incomes above 400 percent of FPL who purchase ACA-compliant policies. Second, the rates for the 24-year-old also did not change, as no subsidy was calculated in Figure D because the gross premium is below the maximum contribution. Third, the net premium for the second-lowest silver plan (the benchmark plan) is the same for the older individuals because the affordability threshold depends only on income and not on age.

Finally, perhaps most enlightening and not at all intuitive, is the finding that at the illustrated income level, the net premiums for the bronze plan by age are inverted due to the leveraging of the premium subsidies (that is, the age 64 individual will pay less than the age 44 individual who will pay less than the age 24 individual). A direct comparison of the current and bronze plans illustrates why young, previously-insured people would more likely remain on current plans while older people would more quickly move to the subsidized exchange plans. Young individuals at this income level may be disillusioned to learn that the mandated coverage that they are strongly being encouraged to purchase is not only more expensive than their previous plan due to age rating compression and other rating changes, but that the premium subsidies are allocated in such a way that the net premium costs for older people are actually lower than the net premiums for younger people for the bronze plan option.

RATE INCREASE IMPACT ON NET PREMIUMS

The impact of rate increases on net premium changes is thought to be an indicator of market disruption.

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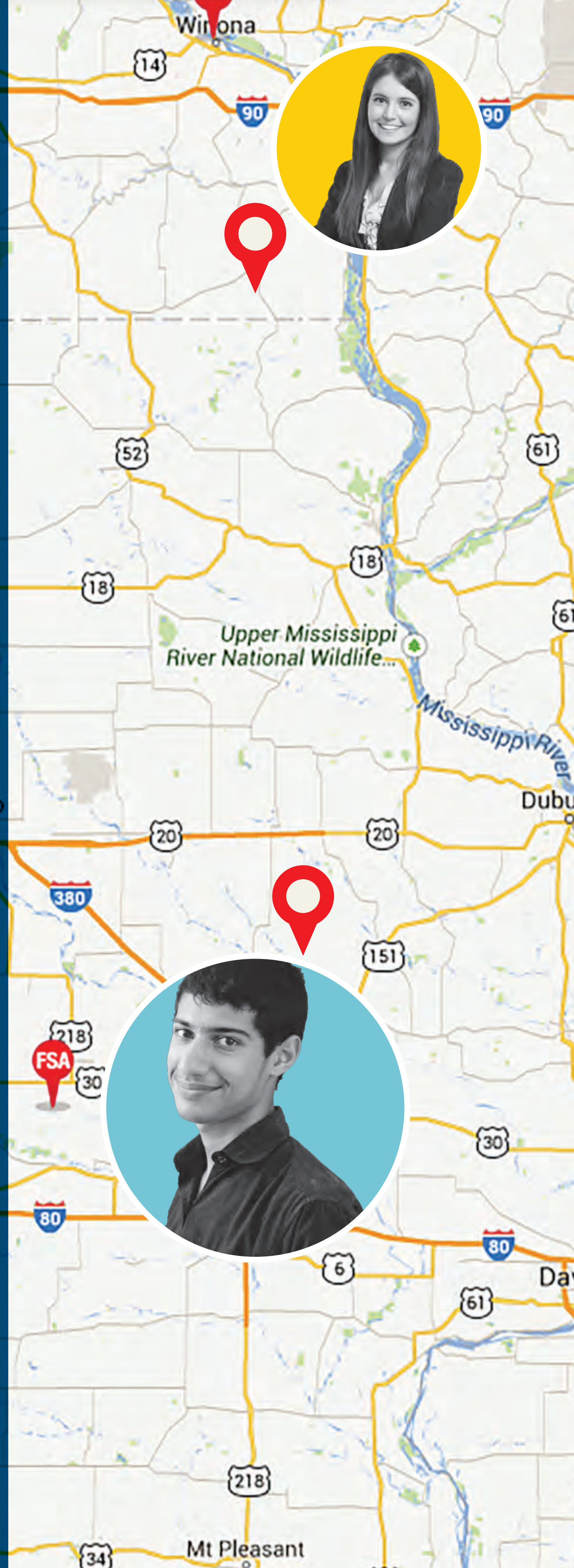


FIGURE A1 MONTHLY PREMIUM OF SECOND-LOWEST CARRIER (WITH 10% INCREASE)

Age	Current	Bronze	Silver	Gold	Platinum
24	$103.13	$217.83	$254.13	$290.44	$326.74
44	$257.81	$304.31	$355.03	$405.74	$456.46
64	$618.75	$653.49	$762.40	$871.32	$980.23

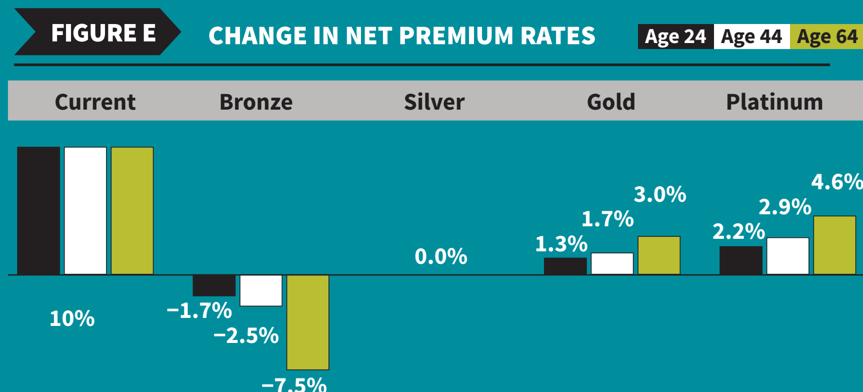
FIGURE C1 PREMIUM SUBSIDY CALCULATION (WITH 10% INCREASE)

Age	FPL Level	Maximum Percent of Income	Benchmark Plan	Maximum Contribution	Calculated Subsidy
24	275%	8.78%	$254.13	$231.06	$23.08
44	275%	8.78%	$355.03	$231.06	$123.97
64	275%	8.78%	$762.40	$231.06	$531.35

FIGURE D1 NET MONTHLY PREMIUM OF SECOND-LOWEST CARRIER (WITH 10% INCREASE)

Age	Current	Bronze	Silver	Gold	Platinum
24	$103.13	$194.75	$231.06	$267.36	$303.67
44	$257.81	$180.34	$231.06	$281.77	$332.49
64	$618.75	$122.14	$231.06	$339.97	$448.89

FIGURE E CHANGE IN NET PREMIUM RATES



As most consumers in the exchanges to date have subsidized insurance, it is instructive to understand the net premium changes to subsidy-eligible individuals. To isolate the impact of the rate changes, it is assumed that individual incomes and the contribution percentages (in reality, slightly higher in 2015 versus 2014) in Figure B do not change. **FIGURE A1** illustrates the gross premium rates after a 10 percent increase from Figure A,[4] again assuming rates for the second-lowest cost plan available. (Note: Under ACA, the benchmark plan resets each year based on updated carrier rates and plans. Individuals looking for the lowest net premium will need to review their exchange options every year and may need to change carriers to keep the desired net premium.)

FIGURE C1 illustrates the premium subsidy calculation for each individual age with gross premium rates at a 10 percent higher level.

FIGURE D1 illustrates the resulting net premiums with gross premium rates at a 10 percent higher level.

FIGURE E illustrates the net premium change for each plan and individual age. Notably, the net bronze premium rates decrease while there is no change to the silver rates. As most consumers have purchased plans less expensive than the benchmark plans, the impact of rate increases will generally reduce net rates for subsidy-eligible consumers.

FIGURE F OPTIMAL PLAN SELECTION FOR 2016

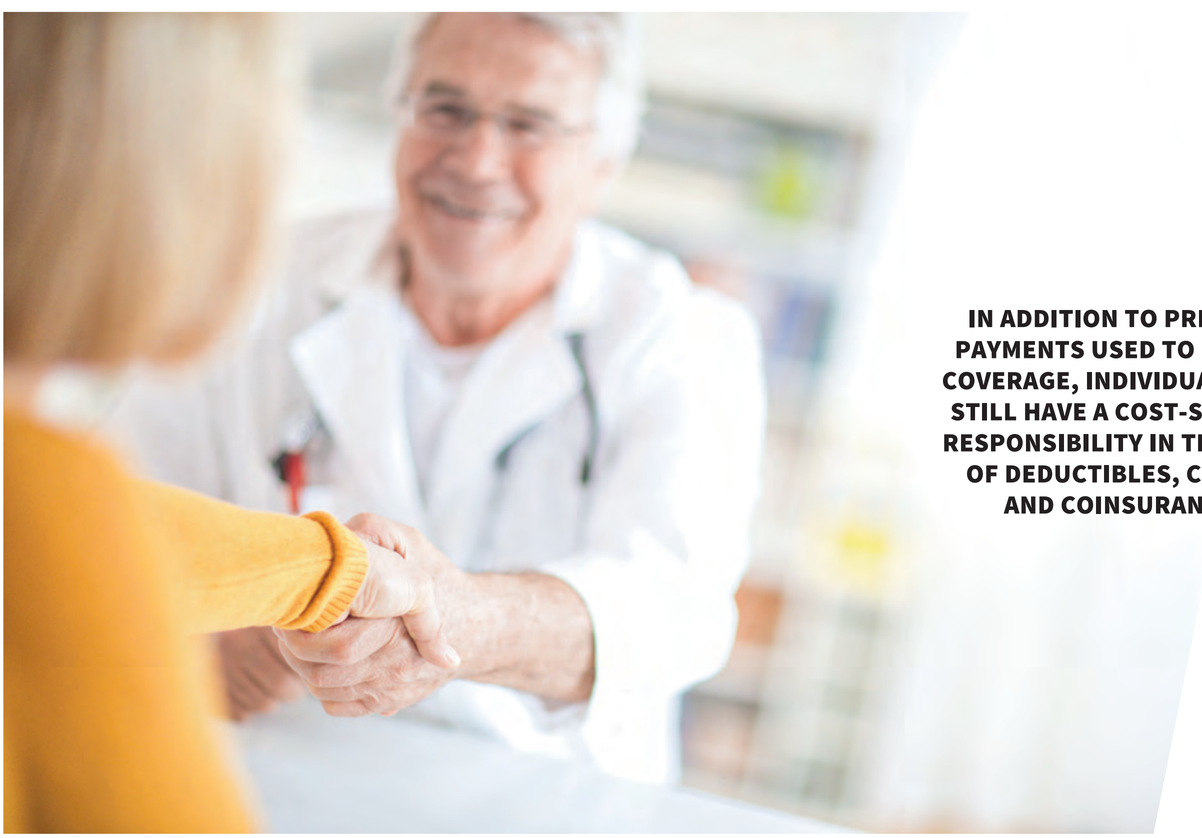
FPL	EXPECTED LOWEST COST OPTION		
	24	44	64
116.5%	Silver	Silver	Silver
141.5%	Silver	Silver	Silver
175.0%	Silver	Silver	Silver
225.0%	Bronze	Silver	Silver
275.0%	No Coverage	Bronze	Bronze
325.0%	No Coverage	Bronze	Bronze
375.0%	No Coverage	Bronze	Bronze
425.0%	Bronze	Bronze	Bronze

EXPECTED TOTAL COST (ETC) AND PLAN SELECTION

No discussion of consumer health insurance purchase decisions is complete without consideration of out-of-pocket cost sharing in addition to premium payments used to obtain coverage. The premiums represented in the figures presented do not present the total consumer cost, as individuals will still have a cost-sharing responsibility in the form of deductibles, copays and coinsurance for the health care they use. In addition, individuals with income below 200 percent FPL who select a silver plan are eligible for cost-sharing subsidies as well as premium subsidies. An individual's ETC for health care can be thought of as the net premium, calculated in the figures presented, plus the expected net cost sharing, versus the applicable tax penalty if qualifying minimum coverage is not obtained.

While not presenting detailed calculations, **FIGURE F** illustrates the 2016 plan selection decision based on ETC for different age and income levels corresponding to the gross premiums presented, using standard utilization and cost models to estimate benefit cost sharing.

While issuers' experience and models will differ, several general



IN ADDITION TO PREMIUM PAYMENTS USED TO OBTAIN COVERAGE, INDIVIDUALS WILL STILL HAVE A COST-SHARING RESPONSIBILITY IN THE FORM OF DEDUCTIBLES, COPAYS AND COINSURANCE.

comments can be made about likely decisions based on age and income:

- Individuals with low incomes (below 200 percent FPL) will overwhelmingly select silver plans to take advantage of the cost-sharing subsidy.
- To avoid the rate change due to age rating compression, many high-income young people with coverage likely would stay on their current plan for as long as possible.[5] They are the most likely to drop coverage when the transitional plans are no longer allowed unless they have a high need for services.
- Middle- to high-income young people are the most likely to go without coverage, assuming they don't expect to need it. As the penalty is a percentage of income, at high-income levels, the penalty will exceed the gross premiums (which do not vary based on income), and high-income individuals will likely purchase at least the minimum required coverage to avoid paying the penalty.

action

IN *HEALTH WATCH*

Read the article, "Implications of Individual Subsidies in the Affordable Care Act—What Stakeholders Need to Understand" in the May 2014 issue of *Health Watch*. Author Greg Fann, FSA, MAAA, discusses the details of the ACA provisions of federal subsidies that affect consumers' cost of coverage in the individual market, and breaks down how the net effect of these provisions will shape consumers' decisions to buy a new level of coverage, retain current coverage or elect to be uninsured (or underinsured according to the ACA definition) despite new tax penalties.

CONCLUSION

The premium subsidy calculations in the individual exchanges represent perhaps the least transparent aspect of the ACA. The resulting federal outlay is dependent on how many subsidy-eligible individuals enroll; the subsidies vary considerably by age and income level, the gross premiums offered in the marketplace, ACA awareness, unemployment rates and overall economic conditions. In addition, subsidy calculations change each year as plans and rates are updated. A proper understanding of the subsidy mechanics is required to formulate detailed enrollment projections.

The exchange subsidy calculations are quite complicated and unfortunately not well understood. As we heard in the arguments leading up to the Supreme Court decision, subsidy eligibility plays a crucial role in the affordability consideration for many potential customers and, ultimately, impacts the overall viability of the market. Actuaries should play a leading role in educating the public about relevant technical matters such as how the ACA subsidies actually function. Otherwise, the only usefulness of the news we hear about subsidies might be to give Don Henley another good song idea. ■

[1] SOA.org/Professional-Interests/Health/hlth-detail.aspx. See Publications: *Health Watch*–May 2014.
[2] In June 2015, a 6-3 Supreme Court ruling upheld the eligibility of subsidies in federal exchange states.
[3] Maximum Percent of Income is 2014 values. These amounts are indexed and are slightly higher in 2015.
[4] In this example, it is assumed that the benchmark plan does not change. In reality, many 2014 benchmark plans are higher than the 2015 benchmark plan.
[5] It is assumed that the "current plans" are no longer available in 2016. If available, the model indicates that they would have the lowest ETC for 24-year-old individuals with incomes greater than 200 percent FPL.

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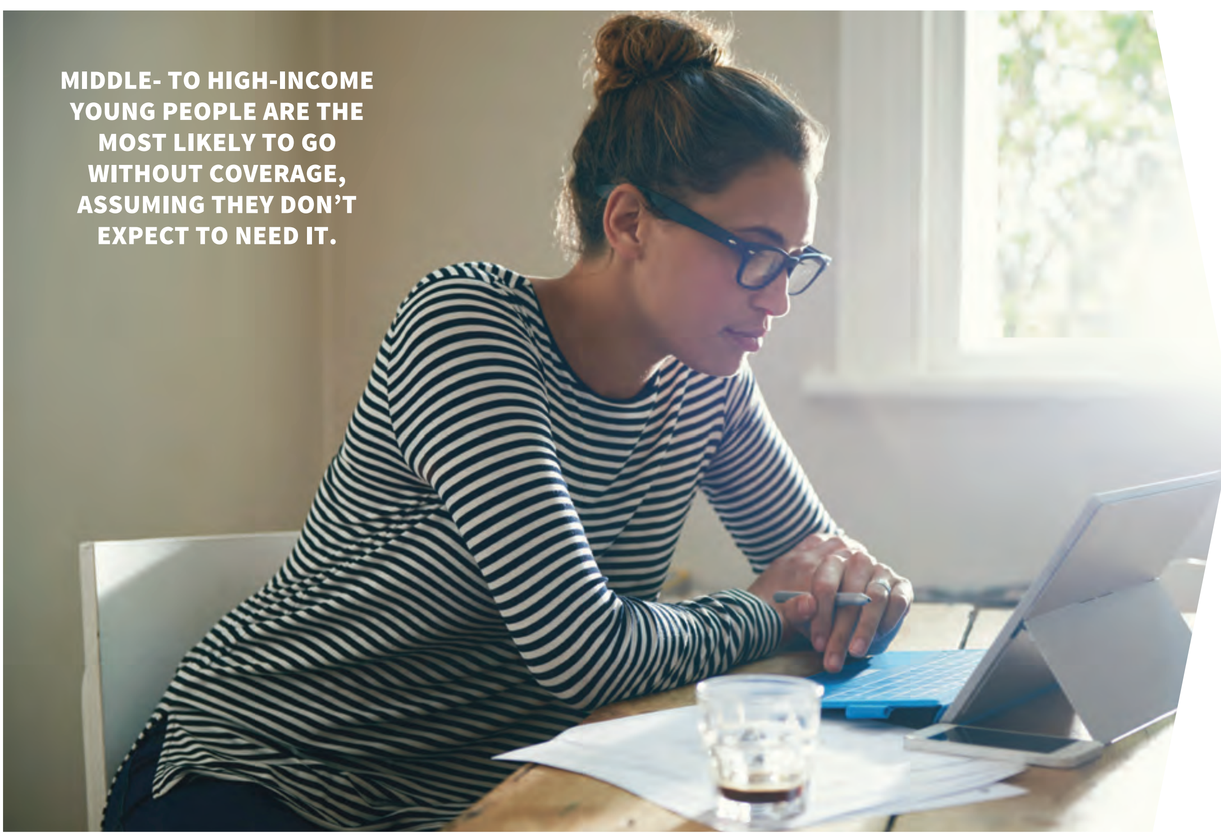

MIDDLE- TO HIGH-INCOME YOUNG PEOPLE ARE THE MOST LIKELY TO GO WITHOUT COVERAGE, ASSUMING THEY DON'T EXPECT TO NEED IT.

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BUILDING AN INCLUSIVE WORK ENVIRONMENT

WHY DIVERSITY MATTERS TO THE ACTUARIAL PROFESSION IN THE UNITED STATES

BY LINDA SHEPHERD AND KWAME DAVIS

Diversity, broadly defined, means appreciating each individual's uniqueness and recognizing our individual differences as a source of strength. These differences can be along the dimensions of race, ethnicity, gender, sexual orientation, socio-economic status, age, physical abilities, religious beliefs, political beliefs or other dimensions.

In the United States, diversity efforts generally refer to opportunities to increase the inclusion of women, as well as individuals of various races, ethnicities, religious affiliations, sexual orientations and differing abilities. Why diversity is important from society's standpoint has been well-documented. As a nation founded on the key principle of equality, that goal will not truly be realized until all segments of society, including businesses, occupations and professions, are composed of individuals of diverse backgrounds in proportion to their share of the general population. This article serves to highlight the reasons why increasing diversity and building an inclusive work environment is crucial to the future of the actuarial profession.

Why is diversity important to the actuarial profession specifically? Diversity allows us to:

1 | **ADVANCE ACTUARIAL SCIENCE'S BODY OF KNOWLEDGE:** Today, many talented minorities with exceptional math, statistics and business skills are not exposed to the actuarial profession and are being heavily recruited into other Science, Technology, Engineering and Math (STEM) careers. Many potential employees with the ability to develop new techniques for managing actuarial risks may be in a different profession today, simply because they have never been exposed to the field.

2 | **ENSURE DIVERSE POINTS OF VIEW:** As recently as the mid-1960s, some companies underwrote and priced insurance products based on characteristics that are now illegal, such as race. For years, many of these rating variables were not appropriately challenged, in part because the majority of actuaries were from homogeneous backgrounds and largely oblivious to the controversial usage of certain variables. As the number of women and minorities in the profession increased, actuaries have found more objective, practical and causal risk classification plans to replace some of these inappropriate and illegal factors; this is in no small measure due to increased diversity of the profession.

3 | **IMPROVE THE FINANCIAL RESULTS OF EMPLOYERS OF ACTUARIES:** Employers want to attract the most talented employees who will likely be successful at their companies. Financial success is defined as directly or indirectly improving revenues and, ultimately, profits. Employers are not solely interested in the theoretical advancement of actuarial techniques, but the practical benefits of actuarial work products that enhance the company's financial results as well. Increasing the pool of talented actuarial candidates from diverse backgrounds increases the likelihood of employing people with the ability to positively affect financial results.[1]

4 | **CONTRIBUTE TO IMPROVING THE OVERALL DIVERSITY IN THE INSURANCE INDUSTRY:** Actuarial science is one of the least diverse professions within the insurance industry. Moreover, many studies have shown that the insurance industry overall is not attracting its share of the millennial generation, which is also the most diverse generation in the history of the United States. Millennials expect to see a diverse workforce throughout all functions of a company. If they don't observe a similar level of diversity to their generation in the workplace, they may be less attracted to the industry.

5 | **CONTRIBUTE TO THE OVERALL ECONOMY:** While often employed by insurance companies, actuaries are also making an impact on other sectors through consulting, government and nontraditional roles. Many consulting actuaries provide risk management services to all sectors of the economy. Diversity plays a crucial role here because many clients will expect their service providers to mirror their diverse workforce. Clients who value diversity in all forms may be apprehensive of a service provider that doesn't seem to share this same value. This could result in lost revenue and opportunities.

6 | **ATTRACT THE BEST CANDIDATES TO THE PROFESSION:** By excluding or marginalizing certain segments of society, we reduce our opportunity to attract some of the brightest and most capable candidates to our profession.

ACKNOWLEDGING THAT DIVERSITY AND INCLUSION ARE ESSENTIAL TO THE FUTURE OF THE ACTUARIAL PROFESSION IS ONLY THE FIRST STEP. HOW WILL YOU GET INVOLVED IN MAKING THE PROFESSION MORE INCLUSIVE?

BENEFITS OF DIVERSITY IN THE WORKPLACE

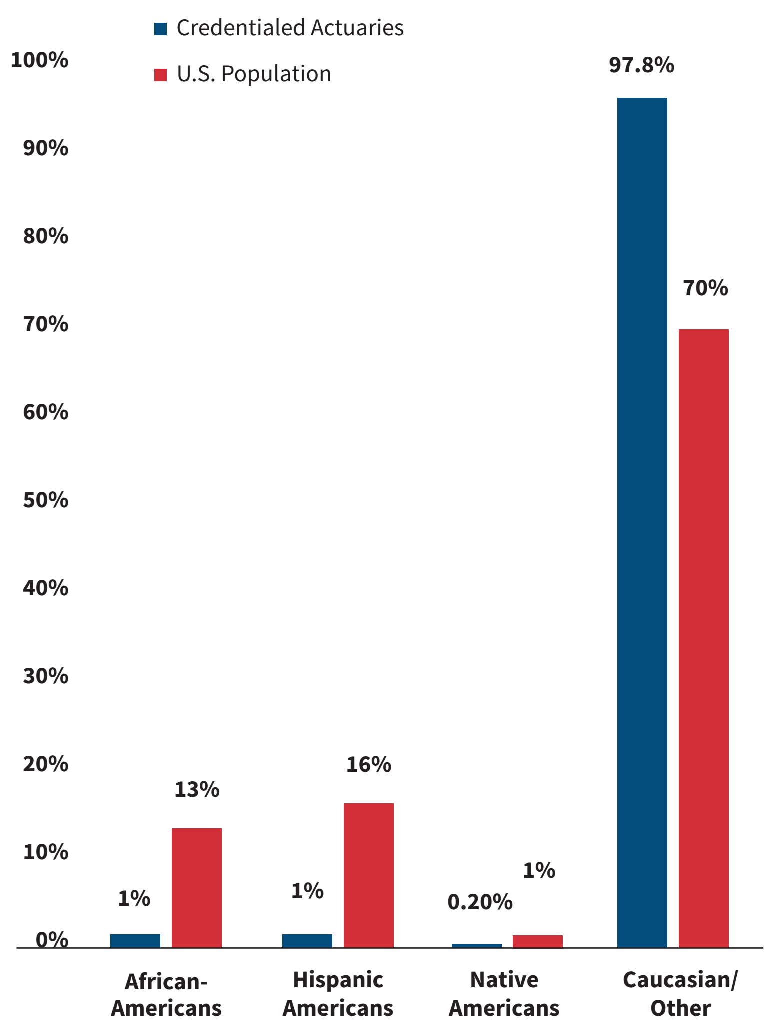
Diversity in the actuarial profession is significant not only to the future of the actuarial science body of knowledge and to the profitability of employers of actuaries, but it is essential to actuarial practitioners as well.

From the underrepresented community's perspective: Having a higher percentage of underrepresented communities such as African-American, Hispanic and Native American in the actuarial profession increases the number of potential role models for young people in their communities to emulate. This in turn will steadily increase the economic success of these respective communities as more members pursue lucrative careers in the field.

From the actuarial candidates' perspectives: Actuary has been rated the No. 1 profession for many years in terms of compensation, work environment, stress levels and other factors. For individuals with an affinity for math, computers and a business environment—matched with the ability to pass the actuarial exams—this field can provide a rewarding career.

Actuarial professional societies and academia are undertaking a significant number of activities to increase the diversity of the actuarial profession. For example, the primary efforts of the Joint Casualty Actuarial Society/Society of Actuaries Committee on Career Encouragement and Actuarial Diversity are directed toward increasing the number of African-American, Hispanic and Native American actuaries.

The graph below illustrates the disparity in representation in the general U.S. population and actuarial profession.



Source: SOA Demographic Study/U.S. Census Bureau

To summarize, diversity is not only integral to the prosperity of our society, but also to each and every profession. Increased diversity benefits the actuarial profession in myriad ways, including advancing actuarial methodologies, contributing to richer perspectives on various issues, improving financial results for employers and the industry, and increasing opportunities for underrepresented groups.

Acknowledging that diversity and inclusion are essential to the future of the profession is only the first step. While many efforts are underway to address this gap, there is still much more to do to make the profession mirror the larger society. All contributions to diversity, regardless of size, stand to benefit us all. The question to you, dear reader, is what will you do next? What diversity initiatives are underway in your firm? How will you get involved in making the profession more inclusive? ■

[1] For more information on the financial impact of diversity, see an article from McKinsey & Company (January 2015). Retrieved from *http://www.mckinsey.com/insights/organization/why_diversity_matters.*

Linda Shepherd, FCAS, MAAA, is a member of the board of directors and a past president of the International Association of Black Actuaries.

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This article was written on behalf of the Joint CAS/SOA Committee on Career Encouragement and Actuarial Diversity and the International Association of Black Actuaries.

GET INVOLVED

Individuals or employers interested in volunteering for efforts to increase diversity in the actuarial profession should contact one or more of the following organizations that are focused on this mission:

THE JOINT CAS/SOA COMMITTEE ON CAREER ENCOURAGEMENT AND ACTUARIAL DIVERSITY (JCCEAD)

The JCCEAD is responsible for increasing the awareness of the actuarial career among students, educators and career influencers in high schools, colleges and universities. In support of that effort, the committee facilitates the evolution of a diverse profession by increasing the talent from the African-American, Hispanic and Native American communities. The Society of Actuaries and the Casualty Actuarial Society jointly sponsor the committee.
www.BeAnActuary.org
Contact David Terne at ***david.terne@thehartford.com***.

INTERNATIONAL ASSOCIATION OF BLACK ACTUARIES

The International Association of Black Actuaries is a professional and student member organization whose mission is to contribute to an increase in the number of black actuaries and to influence the successful career development, civic growth and achievement of black actuaries.
www.BlackActuaries.org
Contact Kate Weaver at ***iaba@blackactuaries.org***.

THE CAS DIVERSITY COMMITTEE

This committee oversees the implementation of the CAS Diversity Strategy and ensures the strategy is reflected in all of the organization's initiatives.
Contact David Terne at ***david.terne@thehartford.com***.

THE SOA ACTUARIAL DIVERSITY TASK FORCE

This task force's purpose is to determine what investments the SOA can make, or programs it can undertake, to achieve the greatest impact on diversity in the actuarial profession over the long term in addition to identifying short-term solutions that could have immediate effect.
Contact Greg Heidrich at ***gheidrich@soa.org***.

THE ACTUARIAL FOUNDATION

The mission of The Actuarial Foundation is to enhance math education and financial literacy through the talents and resources of actuaries. The Foundation sponsors the Actuarial Diversity Scholarship for African-American, Hispanic, Native American and Pacific Islander students.
www.ActuarialFoundation.org
Send an email to ***info@Actfnd.org*** for more information.

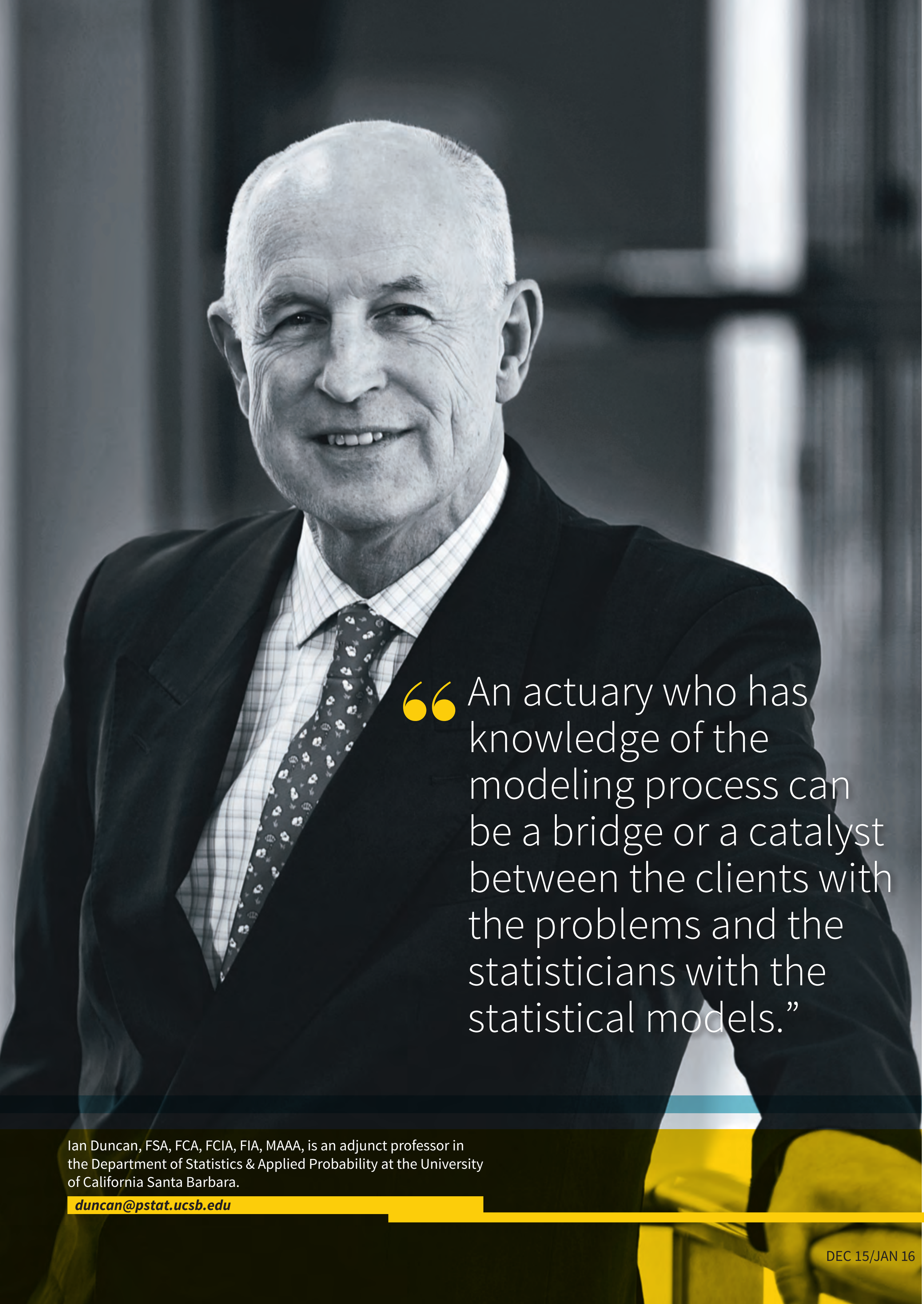
Q&A

PREDICTIVE PIONEER

Q&A WITH IAN DUNCAN, PROFESSOR OF ACTUARIAL SCIENCE

Q: Tell us a little about your background. How did you make the decision to become an actuary?

A: I was interested in the actuarial profession while I was studying for an undergraduate degree in mathematics and economics. I had a summer internship at an insurance company and disliked it; I had no idea what I was doing, and everyone kept telling me how hard the exams were and how hard you had to study. I then pursued a graduate degree in economics at Oxford and considered becoming an academic. But I liked the precision of the actuarial approach to things such as interest and present value, and suddenly the actuarial profession looked more appealing. Plus, you got paid to study. I left before starting my dissertation (more on that later) and became an actuarial student in London.



“An actuary who has knowledge of the modeling process can be a bridge or a catalyst between the clients with the problems and the statisticians with the statistical models.”

Ian Duncan, FSA, FCA, FCIA, FIA, MAAA, is an adjunct professor in the Department of Statistics & Applied Probability at the University of California Santa Barbara.
duncan@pstat.ucsb.edu

JOE KEUM

Q: Would you provide some work history and how it segued into your interest in predictive analytics?

A: I had a fairly typical actuarial student career (rotating from pensions to valuation to international to reinsurance). But what was atypical was moving from England to Canada and then to the United States. Consulting, with the variety of projects and clients, was appealing, and I had the opportunity to start a health actuarial practice at Aetna. When Aetna got out of the business, I moved to Price Waterhouse.

At PW, I had the opportunity to work in management consulting, which was a significant learning experience. I first encountered predictive analytics (PA) sometime around 1995 while leading an underwriting automation project for a large health insurer. They had a team of doctors that manually evaluated high-cost claimants and gave prognoses for future costs. I asked why this couldn't be modeled and automated. I don't think the models existed at the time and, to be honest, access to data was too difficult to have made it practical. But the idea was there.

My next predictive analytics project was working in a consulting role to develop a model to predict variable annuity terminations for a life insurer. Some years later, I had the opportunity to join a health predictive modeling startup, which provided another major learning experience in terms of modeling and data management as well as the difficulties of applying modeling in an operational environment. Today, I am at the University of California Santa Barbara and continue to consult on a number of PA clients.

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

A: My technical skills consisted of having had tutorials in econometrics (regression) at Oxford—that was it. Everything else I taught myself. But I would say that my role in different jobs has been that of a consultant: understanding what PA can do and then organizing others to deliver models, working with the client to see the vision, and implementing the models.

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

A: I work with statistics Ph.D. students, who I find understand the modeling. However, they don't have the business context, understanding of the data, nor the vision to understand how to solve the business problem with a PA model. Nor are they trained in the evaluation and management of risk, which is what sets actuaries apart from other professionals in this space. Some commentators suggest that actuaries can apply their modeling skills in other businesses (we have an alumnus who works at Uber, so this is possible). But our differentiator as actuaries is risk, so our biggest opportunity is in insurance and related businesses.

I think an actuary who has knowledge of the modeling process (without necessarily being an expert) can be a bridge or a catalyst between the clients with the problems and the statisticians with the statistical models. Of course, actuaries could significantly ramp up their statistical knowledge and do it all, and I think that will happen in time as we broaden the ASA syllabus and expand the actuarial knowledge base.

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

A: It depends on your level. If you are a college student, get plenty of statistics courses in methods such as generalized linear models, regression and time series, and build up a portfolio of relevant work to show employers.

If you are a more seasoned actuary with broad experience, the questions to ask include how data and automation could improve the timeliness and accuracy of whatever process you are involved in (underwriting, reserving, risk management, etc.). If you are fortunate enough to have actuarial students, who are probably trained in methods and models, work with them to figure out how models can address your needs.

There are also university courses that you can consider. There has been an explosion of courses in predictive modeling, in addition to more traditional courses in statistics.

One thing, though, that more experienced actuaries will need to be willing to do is potentially take a step back in their careers and compensation. The payoff will be significant, but the short-term sacrifice could be nontrivial for some actuaries.

Q: Tell our readers something they may not know about predictive analytics.

A: The SOA Predictive Analytics initiative will feature actuaries and their models and projects, allowing interested parties to get a broad exposure to the topic. What I find interesting about the models is the economics. Think about this: If we rank a population in terms of a particular outcome that we want to change (e.g., by targeting them in a marketing campaign), the question is how many members of the population should we be targeting?

Some of my published work has been in the area of constructing economic models in health care. How do we estimate the potential return from a program and use this information to structure and run a program? I think there is a feeling that predictive models tell us who will do what. However, the more important use is operational: identifying a subset of members who represent an opportunity and then determining how to engage them.

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

A: I work in health care, where there are two types of PA opportunities. The first is in a traditional actuarial area: risk adjustment, which uses predictive models to normalize populations. The second is in the area of case-finding: identifying high-risk patients for medical management. Before the Affordable Care Act banned underwriting, these models could be used for underwriting and pricing purposes. Now, health plans, hospitals and accountable care organizations have a common interest in knowing what the future holds for their high-risk patients, and what can be done to improve the outcome both clinically and financially. This is a big opportunity if actuaries are willing to get involved in the operations.

Q: What is the SOA doing to support members and help candidates prepare for this growth in demand? Are there other support mechanisms you feel would be helpful to have in place?

A: I have been privileged to be involved in the SOA's Cultivate Opportunities Team during my board term and to have led the SOA Predictive Analytics initiative. I am pleased to say that the board in June endorsed the plan to raise the profile of actuaries in PA. This endorsement comes with a significant commitment of funds, in addition to a

BEING TRAINED IN THE EVALUATION AND MANAGEMENT OF RISK IS WHAT SETS ACTUARIES APART FROM OTHER PROFESSIONALS IN THE PREDICTIVE ANALYTICS SPACE.

major overhaul of the ASA exams to include PA. The SOA's liaison with universities, particularly with Centers of Actuarial Excellence, allows us to collaborate with educators to ensure that candidates are alerted to the opportunity and receive appropriate training.

The SOA has sponsored a professional development course in Advanced Analytics for some years and is expanding its offerings this year with a similar seminar in Health PA. There also has been a significant increase in the number of PA offerings at SOA meetings.

There is one important area in which I hope to see progress. The Casualty Actuarial Society (CAS) is also promoting actuaries in PA, and our efforts would be stronger and more efficient if we could pool our resources, as we do with the Joint Risk Management Section of the SOA, CAS and Canadian Institute of Actuaries, and Chartered Enterprise Risk Analyst initiatives.

Q: What are some of your best professional memories/experiences as an actuary that may inspire others to explore different actuarial paths?

A: Being an actuary enabled me to come to the United States, which has been a great experience because of the vast range of professional and personal possibilities that the country offers. I would say that the greatest professional experience, though, was starting and running a small health care consulting company. Everyone should

> “The SOA Predictive Analytics initiative will feature actuaries and their models and projects, allowing interested parties to get a broad exposure to the topic.”

have the experience of starting and running a company—it’s the best way to learn about business in a very short space of time!

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: I said I would come back to the dissertation topic again! I left Oxford and started as an actuarial student (feeling old at 26) because I thought that if I didn’t, I would be too old to do the exams. But I always wanted to finish my dissertation, and 40 years later I am a candidate at Heriot-Watt University in Edinburgh (one of the largest U.K. actuarial programs). Talk about being too old! The topic, for those interested, is an application of Markov modeling to prediction of different health states. Having to do over, I probably would have finished the Ph.D. first.

The actuarial profession has been very good to me: It has allowed me to live in three different countries, change the focus of my career several times and always provided interesting challenges. I also met my wife, Janet (FCAS, FSA), through the profession. I would hate to give up all the good things that I have experienced by turning the clock back. ■

ROOM FOR IMPROVEMENT

Working to become a better professional is vital to your success. Here are some resources to help you advance your career.

2

BOOK

EXPONENTIAL ORGANIZATIONS
By Salim Ismail

In this book, Salim Ismail, keynote speaker for the opening general session at the 2015 SOA Annual Meeting & Exhibit, looks at how companies can leverage assets like community, big data, algorithms and new technology to achieve performance benchmarks up to 10 times faster than the competition.

Ismail also shares the 10 characteristics that exponential organizations have in common and walks readers through how any company—from a startup to a multinational organization—can streamline its performance and grow to the next level.

Ismail is a technology strategist, best-selling author and executive director of Singularity University, and former vice president of Yahoo!

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bit.ly/CPDTracker

FREE

3 VIDEO

TED TALK WITH SHAWN ACHOR—THE HAPPINESS ADVANTAGE: LINKING POSITIVE BRAINS TO PERFORMANCE

Positive psychology expert Shawn Achor is one of the world's leading authorities on the connection between happiness and success. His internationally best-selling book, *The Happiness Advantage*, gives us five actionable, proven ways to see the world through a more positive lens to increase motivation, engagement and creativity, and help us reach our personal and professional goals. His TED Talk is one of the most popular of all time, with over 11 million views.

Achor was the keynote speaker at the presidential luncheon during the 2015 SOA Annual Meeting & Exhibit. The positive psychology expert graduated magna cum laude from Harvard, where he taught for over a decade and earned a master's degree in Christian and Buddhist ethics. In 2006 he was named Head Teaching Fellow for "Positive Psychology," which eclipsed "Intro to Economics" as the most popular course at Harvard. He founded Good Think Inc. in 2007 to share his research with the world. He has lectured or researched in 49 countries, speaking to CEOs in China, school children in South Africa, doctors in Dubai and farmers in Zimbabwe.

bit.ly/HappinessADVT

4 PODCAST

INTERVIEW WITH JUDITH GLASER, KEYNOTE SPEAKER AT 2015 LIFE AND ANNUITY SYMPOSIUM

Judith Glaser, organizational anthropologist and author of *Conversational Intelligence: How Great Leaders Build Trust & Get Extraordinary Results*, discusses conversational intelligence, self-awareness and how to listen to connect with Kelly Hennigan, vice chair of the SOA's Leadership & Development Section Council, during the 2015 Life and Annuity Symposium.

bit.ly/JGlaser

5 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 favorites for easy retrieval. Actuarial Glossary users may also request new terms be added to the Glossary to further enhance and enrich this robust reference tool for actuaries.

bit.ly/ActuarialGlossary

FREE

If you know of a tool that might be beneficial to other actuaries, please let us know by sending an email to ***theactuary@soa.org***.

SYSTEM UPGRADE

CHANGES TO THE IAA SYLLABUS RESULT IN REQUIRED UPDATES TO THE SOA EDUCATION SYSTEM

BY STEVE EADIE AND KEN GUTHRIE

In 2014, the Education Committee of the International Actuarial Association (IAA) formed the Educating Future Actuaries Task Force. The task force prepared a report that set out, among other things, a recommendation to form another task force to update the IAA education syllabus in order to implement the recommendations set out in the Educating Future Actuaries Report. The IAA Syllabus Review Task Force (SRTF) was duly formed and has been working diligently throughout 2015 to prepare a new IAA syllabus.

During its April 2015 meetings, the IAA Education Committee, on behalf of the SRTF, sponsored an education symposium, during which representatives of actuarial associations from around the world reviewed the draft IAA syllabus. The Society of Actuaries (SOA) was represented by Stuart Klugman, senior staff fellow, Education, and the authors of this article. The syllabus draft can be accessed at: *bit.ly/IAADraft*.

Final approval of the new syllabus is scheduled for the spring 2016 IAA meetings.

WHY DOES THIS MATTER TO THE SOCIETY OF ACTUARIES?

As a full-member association of the IAA, the SOA is obligated to meet the requirements set out under the IAA syllabus. Every full-member association of the IAA must meet this requirement.

Fulfilling this requirement also allows members of the particular association to be considered fully qualified actuaries (FQAs) under the IAA guidelines. All members of the SOA, including ASAs, CERAs and FSAs, meet this requirement and are therefore FQAs. The SOA education system has been designed so that all new members become FQAs.

From a practical standpoint, the SOA must continue to ensure that the ASA curriculum and the CERA curriculum meet the IAA syllabus requirements. Of course, the FSA curriculum will meet the requirement as long as the ASA curriculum achieves it.

This means that changes to the IAA syllabus may require changes to the SOA education system in order to ensure that the SOA continues to meet the IAA guidelines.

FINAL APPROVAL OF THE NEW SYLLABUS IS SCHEDULED FOR THE SPRING 2016 IAA MEETINGS.

WHAT ARE THE PROPOSED CHANGES TO THE IAA SYLLABUS?

The 10 learning areas that make up the new IAA syllabus appear in the first sidebar below. The good news is that for many of these learning areas, there will be no material changes required to the current SOA education system. For example, the learning objectives found under the Foundational Mathematics learning area are prerequisites (that is, not directly assessed) under the current SOA education system and will remain that way. The learning objectives under the Economics learning area are very close to the learning objectives already covered in the SOA education system through Validation by Educational Experience (VEE). Only minor tweaks will be required to comply with the changes.

For other learning areas, the required changes will be a little more involved. For example, under the Modeling learning area, the SOA education system will need to become better balanced between long-term and short-term models. This is a change that the SOA was likely to implement without the new IAA syllabus. The Personal and Professional Practice learning area will also require some relatively minor changes to the Fundamentals of Actuarial Practice (FAP) e-Learning course and to the Associate Professionalism Course (APC).

The Data Analysis sub-learning area adds predictive analytics techniques, such as the generalized linear model and principal components analysis, which are not currently in the SOA education system.

There are new learning objectives in the Data and Systems learning area that will require additions to the SOA education system, and perhaps even new approaches in delivery of these learning objectives and in assessment of candidate achievement under this general learning area.

The IAA syllabus will be implemented in a staged approach beginning in 2017 when all full-member associations are expected to set out plans for implementation. Full implementation of the new requirements is tentatively scheduled for 2020.

DOES THE SOA NEED ANOTHER TASK FORCE?

The good news is “no,” because in June 2015, the SOA Board established the ASA Curriculum Review Task Force. The board created this task force as a result of recommendations from the SOA’s Learning Strategy Task Force, which reviewed and discussed a draft of the new IAA syllabus as part of its work.

This ASA Curriculum Review Task Force will review our ASA education system and, as part of that review, will recommend changes to keep the SOA system compliant with the IAA syllabus. The ASA Task Force reports back to the SOA Board next June. Members of the ASA Task Force are set out in the second sidebar to the left.

These changes are very important to keep the SOA education system relevant, and they also ensure that the education of actuaries globally will be better. More importantly, the changes will allow actuarial educators around the world to meet the expected needs of future actuaries.

The SOA and its Education Committee are proud to have worked with the other members of the IAA to achieve these important changes. ■

LEARNING AREAS OF THE IAA SYLLABUS

Foundational Mathematics	Financial Systems
Statistics	Assets
Data and Systems	Modeling
Economics	Risk Management
Finance	Personal and Professional Practice

ASA TASK FORCE MEMBERS

Jeremy Brown, Chair	Clive Keatinge
Karen Anway	Paul King
Ian Duncan	Stuart Klugman
Stephen Eadie	Kory Olsen
Ken Guthrie	Judy Powills
Mary Hardy	Martha Sikaras

Steve Eadie, FSA, FCIA, is the past general chair of the SOA’s Education Committee and co–vice chair of the IAA’s Education Committee. In these roles, he has worked to improve educational opportunities for actuaries worldwide.

seadie@re-a.com

Ken Guthrie is managing director of Education at the Society of Actuaries.

kguthrie@soa.org


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RESEARCH

INTEREST RATES, RISK SCENARIOS (AND NEW OPPORTUNITIES)

BY R. DALE HALL

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Visit **SOA.org/Research** for more research updates.

Solvency developments involving financial services and insurers. Financial reporting for insurance contracts. The impact of low interest rates and transition to high rates. These are just some of the topics in the current conversations involving the actuarial profession. The financial services practice area continues to be filled with many challenges and opportunities.

In the past two years, there has been an increased volume of financial service-related discussions, continuing education and research efforts involving the Society of Actuaries (SOA). In fact, you may have joined a webinar, read an article or participated in a session on financial topics. For example, the 2015 SOA Annual Meeting & Exhibit recently had sessions covering global capital standards, low interest rate impact on asset adequacy and insights on economic scenario generators in a low interest rate environment. This area is one in which actuaries have outstanding expertise and many new ideas, with the overall goal of enabling the profession to address major issues affecting businesses and the public.

As noted in the SOA research study "Transition to a High Interest Rate Environment: Preparing for Uncertainty," authored by Max Rudolph, FSA, CERA, CFA, MAAA; Andy Jorgensen, Ph.D., CFA; and Karen Rudolph, FSA, MAAA: "A new era is at hand, where investment professionals work with actuaries and strategic planners to understand Asset Liability Management (ALM) issues driven by risk exposures in different environments. This collaboration will move insurers closer to meeting their goals and objectives."

This study looks at the implications of interest rate changes for the life insurance industry, stress testing practices and how to proactively prepare for an uncertain future. It notes that a risk manager's time can be most effective by describing and testing potential scenarios and their impact. This helps insurers better understand the specific risk exposures and create strategies to address the potential problems that may emerge.

While there are several different scenarios involving interest rates, this research provides key learnings on the path forward, such as understanding product cycles, drivers of volatility, stress testing, regulatory impact, product risks and the outlook of nominal interest rates, in addition to the scenarios.

We continue to pursue additional research efforts in this space. For example, the SOA's Committee on Finance Research (CFR) is seeking research proposals to produce information, data, theoretical models and empirical tools useful to actuaries practicing in investment and other finance-related areas. Look for more research updates and opportunities at *SOA.org* under Research At-A-Glance. ■

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

dhall@soa.org

action

GOOD RESEARCH READS

REGULATORY STRUCTURES STUDY

The SOA Committee on Finance Research sponsored an update to a research report authored by PricewaterhouseCoopers LLP. The report explores the main differences between the regulatory approaches in the United States and the European Union. The report describes differences stemming from the historical contexts and environmental influences that exist in each of these territories, as well as the objectives of the regulators.

bit.ly/RegStructures

JOINT STUDY FOCUSES ON ORSA PROCESS IMPLEMENTATION

The Joint Risk Management Section (JRMS) released findings from a benchmark survey to help companies address the needs of internal stakeholders with the Own Risk and Solvency Assessment (ORSA) implementation process. This study examines stress tests and scenarios, incentives, governance, behavioral aspects, evaluation of ORSA impact and organizational buy-in, implementation, challenges, and involvement of boards of directors.

bit.ly/ORSAProcess

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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

WEBCASTS

Ethics in a Pension Context

Dec. 17

Various ethical problems faced by pension actuaries in their everyday practice will be discussed. Ethical dilemmas and possible solutions—and debates on the merits of each—will be included.

bit.ly/PensionEthics

Successful Management of Insurance Business (LTC, LIFE and P&C)

Dec. 17

The various steps involved in the management of in force and runoff insurance business will be highlighted. Topics include asset management options, optimizing profitability metrics, and valuation options and implications.

bit.ly/InsuranceManagement

PODCAST

The Truth Seeking Debate

Tune in to this podcast that focuses on one of the most important problems in analytic research—the development of biased analysis by researchers.

bit.ly/TruthDebate

E-COURSE

Financial Economics

An overview of one of the financial economics disciplines and its relevance to the actuarial profession is presented, with a focus on asset pricing.

bit.ly/AssetPricing

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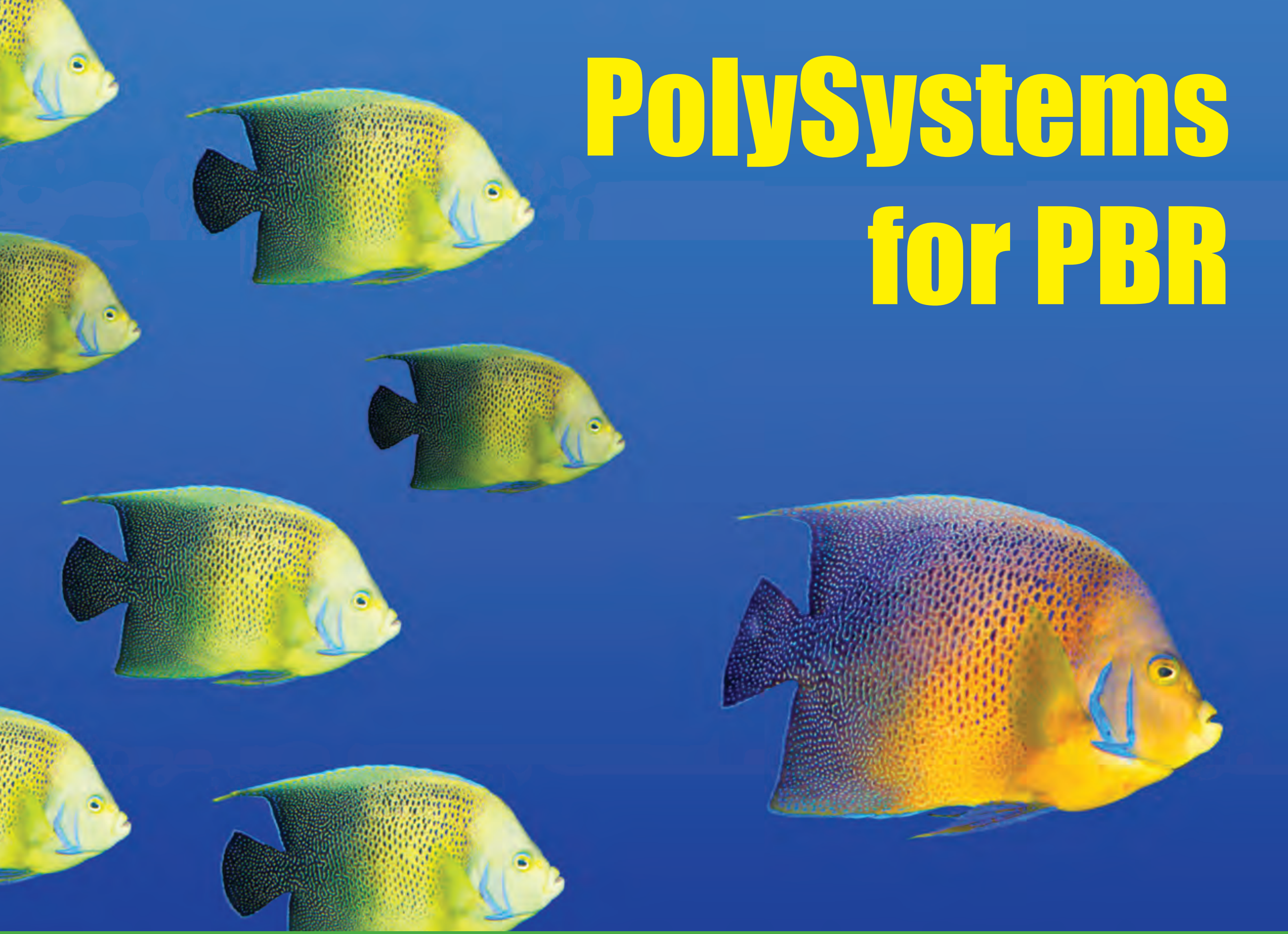
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