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How to TALK to a CEO

CAS Elections 2014

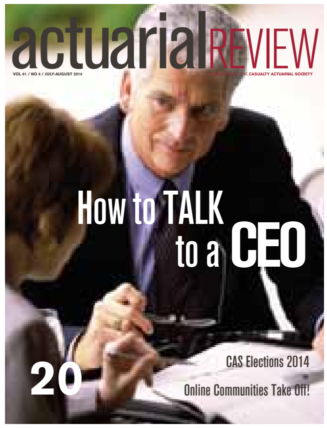
Online Communities Take Off!

actuarialREVIEW
July/August 2014

departments

FSC LOGO

on the cover



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actuarialREVIEW

The magazine of the Casualty Actuarial Society

100 Years of Expertise, Insight & Solutions

editor'sNOTE By ELIZABETH A. SMITH

A Look Inside

July and August are traditionally the times for vacation and leisure activities. The stories in this issue, however, are far from leisurely.

Who hasn't struggled one time or another with just what to say and how to say it? In our cover story, Alice Underwood and Dave Ingram offer practical advice on speaking to those who inhabit the C-suites.

We also focus on the inner workings of the CAS and those who have decided to run for election. These people will affect the direction of the organization. I encourage you to get to know them in "Meet the Candidates."

CAS staff report on a recently added member benefit that members can use to keep connected. Last year the CAS launched its own private social network called Online Communities. Jen Walton highlights the many facets of this new tool and Mike Boa shows how one CAS committee has harnessed the powers of Online Communities to engage and inform its committee members and others.

Also in this issue we have our first installment of "Meet the CAS Staff." Some staffers you may know from meetings, others from the phone or email. Through this new column, you will get to know more about the dedicated people here at CAS. One thing I can tell you: For the most part, we all enjoy moonlit walks on the beach.

We Won!

"Very readable. Clean design. High production value. Nice transition but not too dramatic a departure from original design."

That's how *Actuarial Review* was described by Association Media & Publishing (AM&P) judges, who gave our magazine a Silver EXCEL Award in the newsletter redesign category, the highest award given by the judges in that category this year. AM&P's EXCEL Awards program is the largest and most prestigious awards program that exclusively recognizes excellence in nonprofit association media.

A lot of work went into the redesign, and it's a wonderful feeling to be recognized for it. But we're not sitting back and relaxing. We're going to carry on improving and working to make this magazine the best it can be.

As always we're on the lookout for news stories that interest our readers. We want you to look forward to getting your copy of *Actuarial Review*. ●

Actuarial Review always welcomes story ideas from our readers. Please specify which department you intend for your item—Member News, Solve This, Professional Insight, Actuarial Expertise, etc.

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Follow the CAS

president's MESSAGE By WAYNE FISHER

The Pace of Change is Accelerating

We've had a remarkably successful first 100 years. Are we ready for the next 100? Or the next 10? The pace of change is accelerating, and we need to be innovative, flexible and agile to identify and respond to rapidly evolving opportunities and challenges.

A real wake-up call was the cover article in the May 2014 issue of *Best's Review*, "Data Driven," with a caption reading "Growing momentum for big data in insurance is creating a talent war for professionals trained in data and analytics." Our home turf. Right? The article states, "Everything is big when it comes to big data. Big analysis. Big discoveries….and now big career opportunities." Also, "The biggest challenge to meeting the big-data job crunch is a 'shallow pool' of talent." And actuaries? We're barely mentioned, and only noted in a sentence along with technology professionals and others with skills in this space. AM Best doesn't recognize us as unique in adding value in this rapidly emerging area. We have to do better, both in our education and in creating awareness of the skills of our members.

Data will soon be increasingly available on a range of new areas, such as the Affordable Care Act's impact on medical malpractice and workers compensation pricing, as well as claim costs and reserving, long-term disability, climate change, telematics, insights into customer behavior profiles, cyber and related systemic risks, and so forth. Our profession's competitors will be developing models, accessing preliminary data, compiling consumer info databases to draw insights. But here's where we have the upper hand: insight. Thomas Friedman recently pointed out that knowledge itself isn't valuable (you can find anything on Google or Wikipedia); it's what you can do with knowledge that is valuable. It's the blending of forward-looking education, practical experience and technical skills that is required to form the valuable sagaciousness that sets us apart; we must constantly reinforce this strength. It's the cornerstone of expertise, insight and solutions.

To be a resilient organization for our members in the future, we need to have something "extra" to add value. What is our "extra" for the next 100 years? How will we be adding unique value as actuaries 10 years from now? We need to think in "beta mode," recognizing our contribution as a work in progress that's never finished and always looking for improvements and refinements as the business environment changes.

Remember Y2K? Seems like it was yesterday. Facebook, Wikipedia, LinkedIn and Twitter didn't exist then, and now they dominate the social media and knowledge-sharing landscape.

Innovation is constantly accelerating. Remember Y2K? Seems like it was yesterday. Facebook, Wikipedia, LinkedIn and Twitter didn't exist then, and now they dominate the social media and knowledge-sharing landscape. Remember MySpace rose to invent and dominate social network only six short years ago but didn't adapt quickly enough and is almost unknown today.

A new CAS initiative is our Innovation Council. The Innovation Council will develop and manage a process to systematically identify opportunities and develop action plans to address them. You will hear more about the Council as they reach out for your ideas for our organization and members. We need the Council, and all of us, to "stay in the game."

We're also starting an ERM Special Interest Section. It will be valuable in providing a focus on ERM for the property-casualty industry. But how about forming an Entrepreneurial Actuaries Special Interest Section, a forum for identifying and learning from actuaries working in nontraditional areas to share ideas, support and experiences? Coupled with our Innovation Council, the combination could broaden the perception of what we actuaries can do.

The apparent demand for data scientists, data analysts, statisticians and modelers might provide support for a credential along the lines of the U.K.'s Institute and Faculty of Actuaries new Certified Actuarial Analyst (CAA) designation. Their intent is to have a home in their organization for individuals with strong technical skills who don't want to pursue Fellowship, but still want a credential and will take a limited number of exams and adhere to profes-

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President's Message

from page 6

sional standards. We've had presentations and preliminary discussions at both the American Academy of Actuaries and the North American Actuarial Council (NAAC) on the implications of the CAA. NAAC will also be studying the supply and demand balance for actuaries for the next five years, including developments and potential demand for these CAA types. A question our CAS Board will be considering is whether to embrace such a program to bring in individuals with these skills or to work to provide our "traditional" members with such in-depth technical knowledge.

I'm reminded of York Barbell, a mainstay in my hometown, "where it (weight lifting) all began" 75 years ago. The Olympic weight lifting team trained there and earned gold medals. York owned the exercise franchise. But then along came Nautilus, Cybex, and the like, with the exercise and cardio machines you now see in every gym. And no York barbells.

We cannot be satisfied with our successful past. If we miss the trends, we will become irrelevant. We need to anticipate change and act to seize opportunity with agility and flexibility. We and our environment will be different 10 years from now; I can't imagine 100 years from now.

Our challenge is to build upon our legacy and put in place processes to promote innovation, cultivation of relevant skills and flexibility so that our future members, whether in 10 or 100 years, are recognized by that unique "actuarial value" of expertise, insight and solutions. ●

COMINGS AND GOINGS

The board of directors of the Central Insurance Companies has appointed **Chad Glenn, FCAS, MAAA**, as chief actuary for both Central Mutual Insurance Company and All America Insurance Company. Glenn is responsible for leading the actuarial department at Central, which estimates the appropriate rates to charge policyholders for their insurance products. The department calculates the unpaid claims liability estimates that are a result of the company's promise to pay for policyholders' losses and also forecasts what the company can expect in future premium writings and financial results. Prior to joining Central, Glenn was consulting actuary for Milliman in Chicago. He is a member of the CAS Exam Committee and vice president of the Utah Chapter of the Insurance Accounting & Systems Association.

Kathleen Reardon, FCAS, MAAA, a founding member of Hamilton Re's management team, was promoted to the position of CEO of Hamilton Insurance Group's Burmuda-based Class 4 property-casualty reinsurer, where she will lead the reinsurance business. She had held the position of chief underwriting officer, property. Before moving to Bermuda, Ms. Reardon held various actuarial roles at ACE USA following ACE Limited's acquisition of CIGNA's P&C business in 1999. ●

EMAIL "COMINGS AND GOINGS" ITEMS TO AR@CASACT.ORG.

ACTUARIAL REVIEW *LETTERS POLICIES*

Letters to the editor may be sent to ar@casact.org or the CAS Office address. Include a telephone number with all letters. Actuarial Review reserves the right to edit all letters for length and clarity and cannot assure the publication of any letter. Please limit letters to 150 words. Under special circumstances, writers may request anonymity, but no letter will be printed if the author's identity is unknown to the editors. Announcement of events will not be printed.

Correction

A story in the 2014 May-June *Actuarial Review* contains an error. In "From Scale-Oriented to Risk-Oriented: The Development of the China Insurance Solvency Supervisory System," the percentage cited for the average net incurred claims during the past three years in excess of CNY 70 million should have read 23%, not 26%.

IN MEMORIAM

Kevin J. Atinsky
(FCAS 2004) 1970-2014

Jill A. Frackenpohl
(ACAS 2008) 1975-2014

Richard Lino
(FCAS 1956) 1926-2014

Dave Core, Director of Professional Education and Research

Welcome to the CAS Staff Spotlight, an interview-style column featuring the CAS staff you interact with on a regular basis. In this column, you will read some interesting things about our staff and their roles supporting the membership, their hobbies and what motivates them.

For our first spotlight, we are proud to introduce you to Dave Core.

- **What do you do at the CAS?** As head of research and professional education, I wear two hats, which require different skill sets. I am responsible for keeping both departments focused on our strategic goals and enhancing both the content and delivery of the research and continuing education offerings we provide to our members. But I couldn't succeed without my team—Cheri, Vince, Karen and Nora.
- **What do you enjoy most about your job?** I like working with others to achieve change and to focus on new and better ways to provide services to our members.
- **Hometown:** Weston, Connecticut
- **College and Degree:** University of Virginia, B.A. in Foreign Affairs; and George Mason University, MBA
- **First job out of college:** Bank teller for a small savings and loan company in Norwalk, Connecticut.

- **Describe yourself in three words:** Hard-working, faithful, strategic.
- **Favorite weekend activity:** Anything with the whole family that involves food.
- **Favorite travel destination:** Many places in Europe but I'm still hoping to go to Tristan da Cunha, the remotest inhabited island in the world.
- **One interesting or fun fact about you:** I ran for city council a few years back.

CAS Centennial Celebration: A Meeting for the Members by the Members BY GAIL ROSS

Since the founding of the CAS in 1914, members have served as active volunteers contributing their time, energy, and experience to help the organization grow and prosper. It's quite appropriate then, that our volunteer culture will be on full display as we celebrate our 100-year history during the [Centennial Celebration and Annual Meeting](), November 9-12, 2014, in New York City. This will truly be a meeting for the members, by the members.

The CAS Program Planning Committee is hard at work developing educational program sessions that will be organized and presented by your fellow CAS members, who generously give their time to share their knowledge and expertise. The theme of the meeting is "Celebrating Our Past, Focused on the Future" and we can anticipate thought-provoking sessions that will encourage us to consider solutions to the challenges that lie ahead for the CAS in next 100 years.

What will make the Centennial Celebration unique, however, is the active involvement of your fellow members in aspects of the meeting beyond the educational program. In addition, the meeting will offer myriad opportunities to reconnect with colleagues for informal knowledge exchanges that will enhance the robust educational program anchoring the meeting.

With the details of the educational program still under development, I'm excited to share at this time the details of the social program that will both entertain and provide opportunities to rekindle relationships and facilitate the growth of your professional network within the CAS community.

The meeting begins on Sunday, November 9, when we will welcome our new class of Associates into the CAS. The setting of the Centennial Celebration—in New York City where our 40 original members first met in 1914—is sure to make special memories for our newest members.

I fondly recall the meeting in which I was recognized as a new member, and am still in touch with many members of my class of Associates, with CAS meetings helping to foster the relationships with my colleagues over the years. It is events like the Sunday Welcome Reception that allow for that, and I'm looking forwarding to getting reacquainted with fellow members in a unique venue, the Intrepid Sea, Air & Space Museum. This museum is the only interactive museum where visitors can explore a legendary aircraft carrier, the first space shuttle, the world's fastest jets and a guided missile submarine. Our attendees will enjoy exclusive use of the museum during our reception.

Following two full days of educational sessions, the Celebration will hit its peak on the evening of Tuesday, November 11 at our Gala Dinner. Before enjoying a special meal, we will be entertained by a band and chorus, both composed of CAS members. "Songs through the Decades," the Centennial Music Program, will present a sampling of songs from each decade of the 100-year history of the CAS. The fact that the musicians performing at our Centennial Celebration are our very own CAS members will make the program all the more special. As we've seen through the release of historical CAS musicals from years past on the Centennial website, the musical talent and tradition of the CAS is amazing.

This is just a glimpse of the many facets of the Centennial Celebration and Annual Meeting that will make it a once-in-a-lifetime event. Visit the Centennial website for all of the details on the Meeting. I look forward to seeing you in New York City! ●

Gail Ross, FCAS, chairs the CAS Centennial Steering Committee. She is a principal and consulting actuary for Milliman Inc. in New York.

DOWNTIME BY VICKY MAYEN

Stochastic Soccer

What happens when soccer meets a stochastic process? I recently explored this question as I pondered who would win the 2014 World Cup.

World Cup—what's that? Here's a quick primer: The World Cup is the premier soccer (or football as it's known outside the U.S.) tournament, played by the men's national teams. It's played every four years by the host nation (Brazil in 2014) and the top 31 national teams, which go through a three-year qualifying process. (The host nation is exempt from the qualifying process and is guaranteed a spot in the tournament regardless of how good they are.) The current World Cup champion is Spain. Only seven other teams have won: Brazil (five times), Italy (four times), Germany (three times), Argentina and Uruguay (each won twice), and England and France (each won once). In the first stage of the tournament, there are eight groups comprised of four teams each. Modeling-wise this is the most complicated, since each team plays each of the three other teams in the group, ties are allowed, and the two teams with the highest number of points advance to the next stage (a win earns three points; a tie one point; a loss 0 points; if two teams have the same number of points the winner is determined by the goal difference).

So there are three possible outcomes to every match, and point-ties are common. At the next stage and thereafter, it's single-elimination.

A few World Cups ago I was asked to build an Excel spreadsheet to record predictions for each match. As I was updating the spreadsheet a few weeks ago and thinking about my predictions, the actuary in me started pondering the possibility of incorporating a stochastic process into the predictions. Instead of choosing a winner for each match, could I get more realistic results by choosing probabilities of the different outcomes and having a random process simulate the outcomes? So I designed a spreadsheet stochastic model that takes the probabilities of the different outcomes as the inputs; then the outcomes are simulated via Excel's random number generator.

Sports upsets are not uncommon; all I'm attempting to do is model them. Take the first game of the 2014 World Cup as an example: Brazil vs. Croatia. If I had to pick one outcome, I (and most people who know soccer) would choose Brazil as the winner. But isn't there some chance that Croatia wins or that the game ends in a tie? After all, in the first stage of the 2010 World Cup, Switzerland (ranked #22) beat Spain (#2), lost against Chile (#18) and then tied with Honduras (#32)—Spain went on to win the Cup by beating the Netherlands (#4) who advanced to the finals by defeating Brazil (#1).

The night I designed the spreadsheet, I asked my husband to "play" my

CALENDAR OF EVENTS

Interactive Online Courses
"Understanding CAS Discipline Wherever You Practice"
"Introduction to Predictive Modeling"
www.casact.org/education/interactive/

July 13-16, 2014
49th Actuarial Research Conference
University of California
Santa Barbara, CA, USA

September 15-17, 2014
Casualty Loss Reserve Seminar & Workshops
Manchester Grand Hyatt
San Diego
San Diego, CA, USA

November 9-12, 2014
CAS Centennial Celebration & Annual Meeting
New York Hilton Midtown
New York, NY, USA

March 9-11, 2015
Ratemaking and Product Management (RPM) Seminar
Intercontinental Dallas
Addison, TX

May 17-20, 2015
CAS Spring Meeting
The Broadmoor
Colorado Springs, CO

"game." Since he knows much more about soccer than I do, I wanted his expert judgment to help me assign the probability of the outcomes. Reluctantly, he agreed. He typically finds it stressful to have to choose winners; having to assign probabilities was much worse. Once all probabilities for the first stage had been assigned, it was the moment of truth: What would the simulated tournament results be?

My husband was not amused at the results of the first simulation. The ensuing conversation went something like this:

"Australia?!?" (Australia is in Spain's group and is currently ranked #55.) "How did Australia tie with both the Netherlands (#15) and Chile (#13)?"

The probabilities of those outcomes, as chosen by him, were 10% and 15%, respectively. In this simulation, Portugal beat Spain in the semifinals although Spain had an 80% chance of winning that game. This meant Spain disputed the third place against Ivory Coast. For that game, my husband took no chances: 100% probability that Spain would win. I convinced him to play again; again some very unlikely simulated outcomes occurred. This nearly ruined our evening.

For that game, my husband took no chances: 100% probability that Spain would win. I convinced him to play again; again some very unlikely simulated outcomes occurred. This nearly ruined our evening.

So I checked my spreadsheet and made sure I didn't have errors—there were none. How good was Excel's random number generator? I searched the Internet, found an article citing certain concerns, and did some empirical testing on simulated results; given the unscientific nature of the probabilities in the model, I decided it was good enough.

I've now refined my model by basing the probabilities on the points used in the current team rankings. Testing against the 2010 World Cup, I've been able to get decent results in about 10% of the simulations. That should be encouraging—or not. For the 2010 World Cup, the animal oracle Paul the Octopus jumped to fame when he correctly predicted the winners of all seven games Germany played, plus the winner of the final game. Unfortunately, Paul died soon after his magnificent feat. As for me, at least I'm glad to still be alive.

Postscript—Since writing this article, I've discovered I'm not the only one trying to predict outcomes of World Cup games: Goldman Sachs and Stephen Hawking are also in on the action!

Vicky A. Mayen, FCAS, ASA, MAAA, is an associate actuary for the National Council on Compensation Insurance in Boca Raton, FL.

CAS ELECTION 2014

Choosing Leaders and a Possible Amendment to CAS Bylaws.

This year CAS Fellows will vote on a slate of CAS Board of Directors candidates, a candidate for CAS president-elect, and possibly a proposed bylaws amendment. In the following pages, readers can learn about the candidates through their photos and short biographies.

As of press time, the CAS Board had not given its final approval for the specific wording of the proposed bylaws amendment and related information that will be made available to the electorate. The amendment is intended to clarify CAS presidential succession should a sitting or incoming president be unable to serve out his or her term of office. Assuming the CAS Board authorizes the amendment for a vote, CAS Fellows will be asked to vote on the amendment in conjunction with the 2014 elections. All Fellows with an email address on file with the CAS will be receiving an email with a link to information about the proposed bylaws amendment that will be available through the CAS website.

Voting Procedures

Online voting is the default method of voting in CAS elections. On July 31, 2014, the CAS will send Fellows an email notification that online voting booths are open. The email will include a link to the password-protected ballot.

Fellows who do not have an email address on file with the CAS Office or who requested a paper ballot will receive a paper ballot, which will be mailed on July 31, 2014. Completed ballots must be submitted online or returned to the CAS Office by August 29, 2014.

Please contact Mike Boa (mboa@casact.org) with any questions or comments.

Meet the Candidates

President-Elect Nominee

Stephen P. Lowe, CERA

FCAS 1989

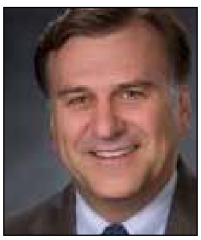
Steve has recently stepped down from a global leadership role with Towers Watson to focus on research and consulting. He was recently awarded the CERA designation for his thought leadership in risk management. Steve served on the original task force that advised the NAIC on the development of risk-based capital, leading the efforts to measure property-casualty insurance risk. He has won the *Variance* Prize, the James Anderson Prize and the Hachemeister Prize (twice) for papers he has published. Steve has served on many committees of the CAS and the Academy. He is currently serving on the CAS Board of Directors.

Board Director Nominees

Kendra M. Felisky, CERA

FCAS 1998

As an FCAS for the last 16 years, working internationally, Kendra Felisky brings a unique perspective to the issues facing the CAS, as she has experienced firsthand the value placed on the FCAS qualification, continuing education and professionalism requirements by the international business community. Additionally, her role as CERA and CRO gives her a unique view of how the CAS can help support others making that transition or moving into other less conventional career paths.



Barry A. Franklin, CERA

FCAS 1993

My recently completed term as CAS Vice President-ERM afforded me the opportunity to observe and contribute to board discussions, both formal and informal, during pivotal moments in CAS history and underscored to me the critical role the board plays. I view being asked to run for the board an honor and serving on the board both a privilege and a great responsibility. I am confident my previous CAS leadership experience and diverse actuarial and business background will serve the CAS well, and my positive approach to problem-solving will contribute to board deliberations. I look forward to serving the CAS in this capacity.

John T. Gleba

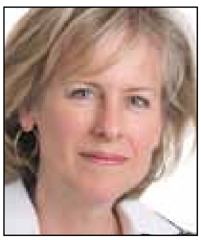
FCAS 1999

Our profession is at a crossroads. Recent developments within the actuarial profession have cast doubt as to whether we can continue to operate in an environment of trust and cooperation. If we are to achieve our strategic goals, we need to enhance the value of our credential. We need to focus on the advancements we have made in the field of property-casualty actuarial science in the past and ensure that this innovation continues. And we need to broaden awareness of our brand so that current and future generations of the CAS can achieve worldwide recognition and respect.

Wesley J. Griffiths

FCAS 2009

I am a dedicated and energetic CAS volunteer whose leadership skills helped kick-start our university outreach efforts. The time is right for me to engage at a deeper level within CAS and the board of directors is a great forum. I am uniquely positioned to represent the insurance company perspective as well as the interests of the newer members—both of which are absent from the leadership table today. I am passionate about the future of the CAS and am excited about the opportunity to serve as a board member in more strategic ways across the full spectrum of challenges.



Camille Minogue

FCAS 1996

As a board member, I will embrace the challenges ahead and work hard to position us for a future rich with opportunities for our membership. Since starting my actuarial career in 1991, I have worked in both the U.S. and Canada, helped shape public policy, kept abreast of trends both inside and outside of our industry, and have significant involvement in carrying out the educational objectives of the CAS. My experience gives me the broad perspective and collaborative orientation that are necessary to be a highly effective and collegial board member. I would welcome your vote and the privilege to serve.

Mark W. Scully

FCAS 1987

As the CAS enters its second century, facing existential threats from the SOA, it will need a board of directors with a broad range of perspectives. I believe that I bring some unique experiences to the table and would be pleased to help the society face these challenges. Having worked in a range of practice areas, as a consultant and a company actuary, both in the U.S. and abroad, I believe I can contribute to important discussions ahead. My name is Mark Scully and I approve this message.

Christopher J. Townsend

FCAS 1986

I strongly believe in the value that the CAS voice brings to the international actuarial community as the only actuarial society dedicated exclusively to casualty actuarial science. The CAS Board and staff worked hard the last three years to develop a sound strategic plan. The board must continue to balance resources between supporting the expansion of casualty actuarial science and remaining the gold standard in our core insurance business. The regulations and standards affecting insurance are increasingly influenced by international bodies. As a Canadian with regulatory, company and international experience, I can help the CAS embark on its second century.

Robert J. Walling III, CERA

FCAS 2001

I am excited about the opportunity to serve on the CAS Board. I have been an active volunteer in the CAS for 17 years and have chaired several committees and currently serve on the Leadership Development Committee. I am also a frequent author and speaker on a wide variety of actuarial issues. The actuarial profession is facing great changes and innovations. Technology, big data, social media, regulatory and accounting changes, and approaches to risk financing are all influencing the skills needed by tomorrow's actuaries. My skills and experiences equip me to be an informed voice within CAS leadership.

Interact, Learn and Network—CAS Online Communities Take Off!

By JENNIFER WALTON

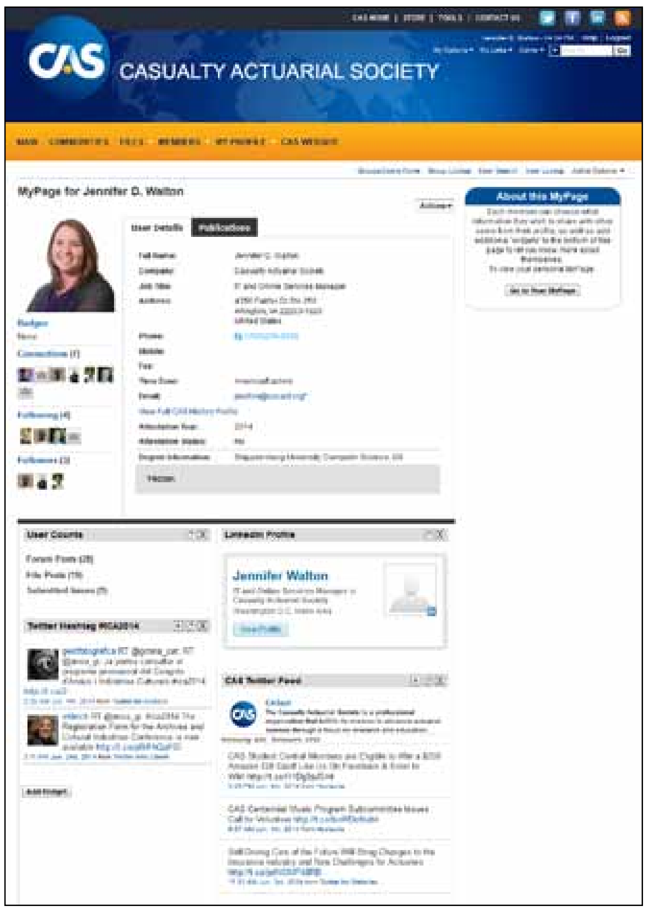
One of the goals in the CAS Strategic Plan is focused on Community. The Plan specifically calls for the CAS to establish new networking vehicles to improve the connectivity of our members. The CAS is very proud of the networking interaction between members at meetings and seminars, but in today's financial climate, companies are closely monitoring employees' travel budgets. Many members are limited to attending one meeting per year, if they travel at all.

To help fill the educational needs of our members, the CAS has been offering more webinars and online courses, but within this framework, how can we maintain the collegial interaction that we used to have? It is hard to connect with people just by looking up email addresses in a directory. To address the gaps in connectivity, the CAS has developed a new online tool, the CAS Online Community.

As a private social network, the CAS Online Community allows users to interact with CAS members, candidates and others with an interest in the CAS. Users can search for others in property-casualty actuarial roles, participate in online discussions, share files, create blogs about issues of interest, and update their own pages with pictures and information about themselves and what they are doing. People can make connections with one another to stay in touch, or can follow other users they may find interesting to keep apprised of their activities within the Online Community.

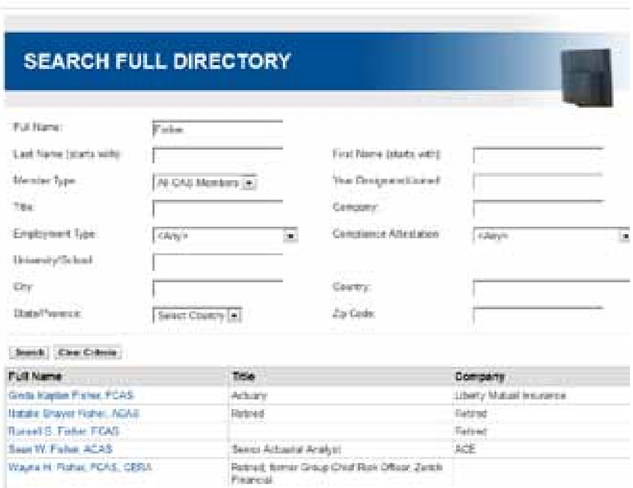
Setting up Your MyPage

MyPage contains information that will be shared with other users or connections in the Online Community. This is where the contact information you have designated as publishable will display, along with your designation, papers that you have published and your current-year continuing education attestation.



You can update your profile by adding a picture to your page and by providing further information about yourself. Below the line on your MyPage, you have the freedom to add custom widgets to your page. Examples include your LinkedIn profile, your Twitter feeds, your favorite hashtags, your pictures from Flickr or Picasa, your most-watched YouTube videos, your comments or activities in the community or your favorite blog. Each widget can be displayed to everyone or can be made visible only to your connections.

Search the Directory



The CAS Online Directory is now powered through the Online Community and offers users the ability to search based on the standard fields: name, address, member type, designation year, title, company, employment type and CE compliance. New this year is the option to search by school name to connect with fellow graduates.

Build Your Network—Following vs. Connecting

As you search the directory, you can build your CAS network. In doing so, you will find that there are some people whose activities you are interested in and others with whom you would like to be in contact.

Following someone is passive. You can follow anyone—it doesn't imply any relationship, similar to Twitter.

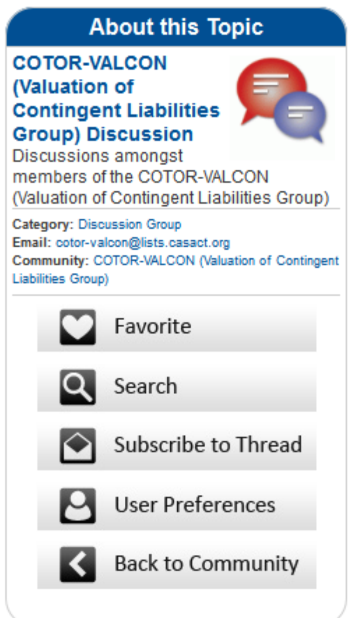
Connecting requires the person on the other end to *confirm* that you have a connection.

While there are not many differences between following and connecting, the biggest difference is the ability to set up security on your MyPage to allow only your connections to see more data about you (i.e., your phone number)—followers will not be able to view the data.

Stay in Touch—Favorites vs. Subscriptions

If you want to stay up to date on everything that happens within any of the communities, click on the "**Add to Favorites**" button on the top right-hand side of each community home page.

You can make almost anything in a community a Favorite, so that when either the community is updated or people respond to a message within it, you will be notified. Blog posts, individual discussion threads and file libraries are examples of more specific things that you can Favorite.



The CAS Online Community can generate a single email once per day, once per week, or once per month for all things marked as favorites across the whole site. The emails offer a listing of any of the items that have come in for each community, with links back to the site—the emails will contain many titles, but few details, which provides a nice way to stay in the loop without getting inundated by emails.

Subscriptions are for discussion and announcement lists that generate emails. You can manage these emails under My Subscriptions and can choose to receive individual emails or digest versions. Also, with the click of one button, you can set all subscriptions to "Vacation!"

At left, the Online Community landing page for CASNET.

Online Communities in Action: University Liaisons BY MIKE BOA

The CAS University Liaison Program has grown to more than 350 CAS members who have volunteered to be liaisons to colleges and universities. The program matches CAS members with academics to provide the academics a one-on-one contact with a practicing actuary, helping facilitate the partnership between the academic community and the actuarial profession.

The University Relations Committee manages the University Liaison Program with the aid of a vibrant online community that harnesses the collective knowledge, experience, and enthusiasm of the second-largest group of volunteers within the CAS (behind only the Examination Committee). The Committee is leveraging the online community platform to foster the success of the University Liaison Program in a number of ways:

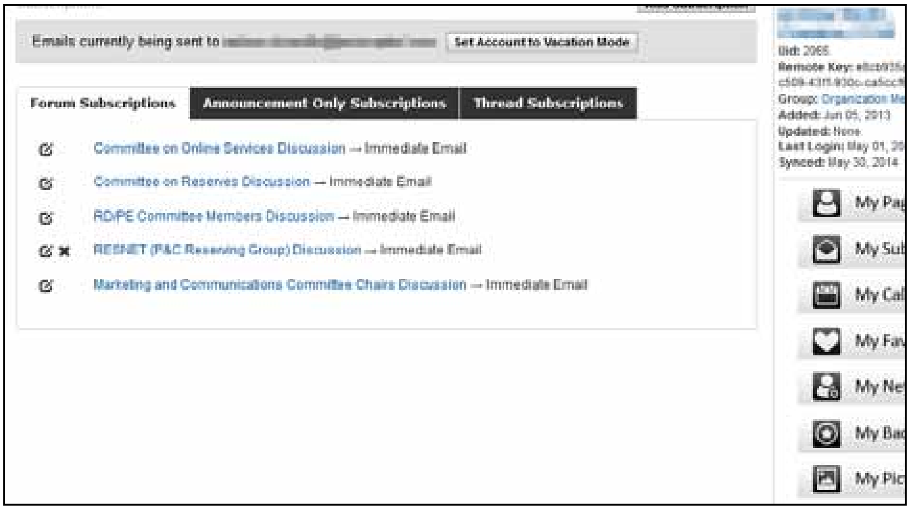
- The community blog shares insights, tips and perspectives with university liaisons from CAS staff members and other university liaisons, with posts like "Best Practices for University Liaisons," "What University Liaisons Need to Know About Changes to the Exams," and "Connecting with Professors and Students During the Summer Months."
- The community file library serves as a central repository for the wealth of resources available to university liaisons, such as the CAS University Liaison Communication Toolkit and PowerPoint Presentations for University Liaisons.
- The discussion forum allows university liaisons to connect with fellow university liaisons to ask questions, share success stories, and discuss any topics of common interest.
- The calendar of events provides an easy reference to actuarial career fairs, student programs at CAS meetings and seminars, and other events of interest to University Liaisons.

As of June 2014, 365 CAS volunteers serve as liaisons to 315 schools, up from 279 liaisons to 231 schools just eight months prior. The rapid growth of the CAS University Liaison Program had the potential to make the program difficult to direct, particularly for a group of volunteers managing another group of volunteers. But the adoption of the University Liaison online community has provided a virtual home for the program and its enthusiastic volunteer army of CAS members who are spreading the word around the world about the CAS's gold-standard credentialing process for property-casualty actuaries. University Liaisons are truly an online community in action. ●

Mike Boa, CAE, is CAS chief communications officer.

Earn Badges

Participation in the CAS Online Community will earn you points towards different types of badges. The more you participate, the higher ranked badges you will receive and the more badges you will earn. Badges can be awarded for making updates to your MyPage, posting in a discussion group, commenting on another person's post, connecting and following other community members, or visiting certain pages of the community. New badges will be available as the community grows and some badges will only be available for limited times, so stop by often to see what's new.



We hope all CAS members and potential members will take this opportunity to engage with their peers and colleagues in this private online social community! Please contact the Actuarial Resource Center if you need assistance with your online account. ●

Jennifer Walton is the CAS IT and online services manager.

How to Talk to a CEO

Knowing your CEO's priorities is key to communicating effectively.

By DAVE INGRAM AND ALICE UNDERWOOD

What's the job of a CEO? When you come down to it, a CEO's job is to make decisions. The right decisions.

As an actuary, your work provides valuable insight on critical business issues—insight that can help a CEO arrive at the right decision. But all the insight in the world doesn't help if the person making the final decision doesn't see it and, just as importantly, *understand* it in a way that enables true influence to the decision-making process.

As George Bernard Shaw observed, "The single biggest problem in communication is the illusion that it has taken place."

Thinking about thinking

In his 2011 book, *Thinking, Fast and Slow*, Daniel Kahneman describes two modes of thinking. The first is fast, intuitive and applied so often in our daily lives that it takes over almost automatically. The second is slow, rational and calculating, and takes a lot of work. It's pretty easy to see which mode actuaries are trained to strengthen.

And, of course, a statistical, rational process is extremely useful. Predictive models can do many things as well as, or better than, the unaided human brain—even when that brain is highly trained. In one experiment, Paul Meehl[1] looked into whether trained psychologists would do better than a statistical algorithm at diagnosing patients admitted to hospital

programs. He found that the algorithm did better than the average clinical psychologist and about the same as the more experienced clinical psychologist.

Some business leaders climb the corporate ladder using a path that requires more "fast, heuristic-based" thinking, however, than "technical, algorithmic analysis." That's not necessarily a bad thing!

Physics, like actuarial science, is a crucial area of human endeavor. Physics allows us to understand the underlying laws of nature and make valid predictions. Accordingly, the best way for an outfielder to catch a baseball is to:

1. Gather the following data:
   - Exact wind direction and speed over the path of the ball
   - Exact speed of the pitch at the time it reaches the batter
   - Exact bat speed
   - Angle at which the bat strikes the ball
2. Solve the following equations for future times t_0 to t_n in order to determine the time t_i and position $r(t_i)$ for the ball's impact with the ground:

$$\begin{aligned} r &\equiv r(x, y, z, t) \equiv x(t)\hat{e}_x + y(t)\hat{e}_y + z(t)\hat{e}_z \\ &\equiv r(r, \theta, \phi, t) \equiv r(t)\hat{e}_r(\theta(t), \phi(t)) \\ &\equiv r(r, \theta, z, t) \equiv r(t)\hat{e}_r(\theta(t)) + z(t)\hat{e}_z. \end{aligned}$$

3. Then run to spot $r(t_i)$ by time t_i and catch the ball.

Just kidding!

What successful outfielders actually do is heuristic:

1. Keep moving.
2. Keep adjusting your position towards your best guess of where the ball is going to fall.
3. Catch the ball.

Gerd Gigerenzer[2] calls this the "fast and frugal" approach. It uses Kahneman's first mode of thinking.

The outfielder's approach isn't wrong. The physicist's approach isn't wrong either. But heuristics-based thinking is more useful than equations in that particular context. And the leader whose experience has involved more outfielder-like situations than physicist-like situations will naturally gravitate towards a fast and frugal approach to decision-making.

How do executives make decisions?

Actuaries learn to define key metrics and then find solutions that optimize those metrics. For example, we may seek to maximize expected value. But a large group of executives that Zur Shapira polled and interviewed about their approach to risk-taking[3] decidedly did *not* favor a "maximize expected value" approach to decision-making under risk. (By the way, this implies that almost all these folks are irrational or that the definition of "rational" used in financial economics and

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[1] Meehl, P. 1954. *Clinical versus Statistical Prediction: A Theoretical Analysis and a Review of the Evidence*. University of Minnesota.
[2] Gigerenzer, G. 2008. *Rationality for Mortals: How People Cope with Uncertainty*. Oxford University Press: New York.
[3] Shapira, Z. 1995. *Risk Taking: A Managerial Perspective*. Russell Sage Foundation.

All the insight in the world doesn't help if the person making the final decision doesn't see it and, just as importantly, understand it in a way that enables true influence to the decision-making process.

behavioral economics is incorrect.) Instead, their preferred approach was to *maximize* likely profits from among possibilities with acceptable downside potential.

This fits with what Gary Klein found in his book *Sources of Power: How People Make Decisions*.[4] In studying how highly experienced people make decisions, Klein discovered that they do not typically use a slow, rational process. Their "natural" process is to study the problem against one solution quickly selected from their mental "library," which has been constructed over years of experience. If, upon closer examination, that solution appears unworkable, they seek to improve it or identify another solution that would pass the test that the original solution failed. At the end of their analysis, they have a solution that works under all the conditions that their study anticipated.

Such an approach works well for executives who must make decisions quickly—especially when not all of the variables can readily be quantified, and when (unlike the physics of baseball) there is no single, precise model for the exact relationships among them. So it's no surprise that many CEOs make use of it. That doesn't make them irrational.

In fact—as we have set forth in previous articles—a framework that allows for plural forms of rationality can help us to understand people's real-world behavior. Drawn from anthropology, the plural rationality framework recognizes that groups tend to exhibit four types of risk attitudes: manager, maximizer, conservator and pragmatist.

Our research to date with insurance professionals suggests more than 50% of top executives favor a maximizer or pragmatist view, whereas this is only true of 20% of actuaries. Although actuaries are highly trained in the manager approach, only a minority of top executives agree with this view of the world.

In other words, *actuaries often need to present their recommendations*—based on careful, rational, painstaking analysis—*to decision-makers who do not really trust analysis*.

Don't just speak—Have *influence*

The point of communication isn't to speak. It's to be heard and understood—to have influence and motivate action. Effective communication requires knowing what ***information*** you want to convey and what ***action*** you want to motivate, but that's not enough. You must also ***know your audience***—in this case CEOs—well enough to determine what factors will truly resonate and motivate them to take the desired action based on your information.

It's a good idea, for example, to have a sense of the CEO's thinking style (ana-

[4] Klein, G. 1998. *Sources of Power: How People Make Decisions*. MIT Press.

Four Types of Risk Attitudes

Risk attitude	Quick description	Preferred strategy
Manager	Carefully quantifies and balances risk vs. reward.	Risk Steering
Maximizer	Increasing reward is much more important than reducing risk.	Risk Trading
Conservator	Reducing risk is much more important than increasing reward.	Loss Controlling
Pragmatist	The future is much too uncertain, so keep options open.	Diversification

lytical or heuristic?), decision process (rational decision-making or natural decision-making?) and risk attitude. In many cases, it will likely be more effective to downplay the detailed analytical process by which you arrived at your conclusion. Instead, focus on what it means to the company and to the CEO's priorities.

Common priorities include customers, profits, corporate survival and value growth. Which of these is most likely to catch a CEO's attention? There's no single answer, as you can see from the following quotes:

The purpose of a business is to make as much money as possible for the shareholder.
—Milton Friedman

The purpose of a business is to create a customer.
—Peter Drucker

On the face of it, shareholder value is the dumbest idea in the world. Shareholder value is a result, not a strategy...your main constituencies are your employees, your customers and your products.
—Jack Welch

So you need to learn what will best motivate your audience. Take those priorities, whatever they may be, into account when you craft your message. Summarize the parts of your message that speak less directly to the top priorities, and spend more time and effort conveying how your insight addresses what the CEO sees as the key corporate need.

You may have priorities (for example, mathematical elegance, exacting precision, efficient run time) that are not very important to the CEO. Unless those are inextricable from the information you must convey or the action you want to motivate, keep them off stage. Even if they *are* inextricable, you still must focus on how your insights affect the CEO's priorities in order to get the CEO's attention.

Be the change

We advise against trying to change your CEO. Although many actuaries have wished they could change the way that their CEO approaches technical issues, organizational behavior expert Edgar Shein says that people will change only when "the pain of changing becomes

less than the pain of staying the same." If there's no pain, there's no change: people must perceive that something is broken to even consider change. Change is always seen as potentially painful and dangerous.

When the company is in a truly painful spot, you *may* be able to get the CEO to take a different approach...but even then, flexibility in your communication style is much more likely to be effective.

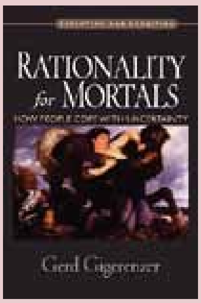
Remember: The CEO's job isn't just to make decisions—it's to make the right decisions. Your job as an actuary isn't just to analyze—it's to communicate the results of that analysis to your principal in a useful format. Understanding your audience is a fundamental strategy for avoiding the *illusion* of communication; it's the key to crafting your delivery to achieve meaningful influence. ●

David N. Ingram, FSA, CERA, FRM, PRM, is senior vice president for Willis Re in New York. Alice Underwood, FCAS, CERA, is executive vice president for Willis Re in New York and serves as the CAS vice president-research and development.

A Reasonable Reading List

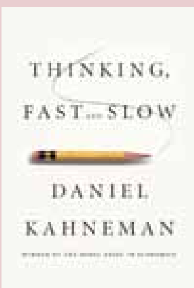
Check out these titles to learn more thinking.

"**Clinical versus Actuarial Judgment**" (1989) by R.M. Dawes, D. Faust and P.E. Meehl, in *Science* 243(4899), 1668–1674.



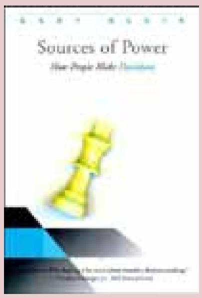
Rationality for Mortals: How People Cope with Uncertainty by Gerd Gigerenzer, (Oxford University Press: New York. 2008.)

"**Conditions for Intuitive Expertise: A Failure to Disagree**" (2009) by D. Kahneman and G. Klein, *American Psychologist* 64(6), 515–526.

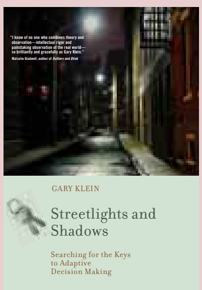


Thinking, Fast and Slow by Daniel Kahneman (Farrar, Strauss and Giroux: New York. 2011.)

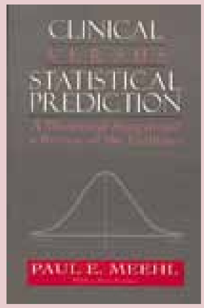
"**From Meehl (1954) to Fast and Frugal Heuristics (and Back): New Insights into How to Bridge the Clinical-Actuarial Divide**" by K.V. Katsikopoulos, T. Pachur, E. Machery and A. Wallin (2008) in *Theory and Psychology* 18(4), 443–464.



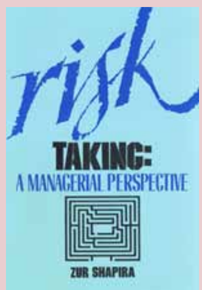
Sources of Power: How People Make Decisions by Gary Klein (MIT Press. 1998.)



Streetlights and Shadows: Searching for the Keys to Adaptive Decision Making by G. Klein (MIT Press. 2009.)



Clinical versus Statistical Prediction: A Theoretical Analysis and a Review of the Evidence by Paul Meehl (University of Minnesota. 1954.)



Risk Taking: A Managerial Perspective by Zur Shapira (Russell Sage Foundation. 1995.)

"**A Behavioral Model of Rational Choice**" by Herbert A. Simon in *Models of Man, Social and Rational: Mathematical Essays on Rational Human Behavior in a Social Setting* (Wiley: New York. 1957.)

Analysts and Actuaries Discuss How New Capital Changes Insurance Industry BY JIM LYNCH

Reinsurance companies and the entire property-casualty industry need to evolve as waves of capital reshape their business model, a trio of industry analysts agreed at a session during the [CAS Seminar on Reinsurance](), held May 21-22 in New York City.

Exactly how to do that, however, is a subject for debate. Reinsurers face a growing threat from the capital markets—hedge funds, pensions and others that have found innovative ways to replicate what reinsurers do. This so-called alternative capital is driving reinsurance prices lower, especially the cost of reinsuring losses from Florida hurricanes.

There are signs alternative capital will seep into other areas of property-casualty insurance and reinsurance. How reinsurers can respond was a major theme at the analysts' discussion, part of the seminar's first general session titled, "The (Re) Insurance Industry—An Analyst View." The panelists also touched on a wide range of other topics, including the impact of inflation on company balance sheets and how investors place value on publicly traded property-casualty companies.

The analysts did not always agree on how to react. Alan Zimmermann, managing director for Assured Research, and Matthew C. Mosher, FCAS, senior vice president of rating services for A.M. Best Company, believed the industry needs to move on to new opportunities.

"If you are not willing to change with society, you are going to lose your relevance," Mosher said.

Meyer Shields, FCAS, managing director at the investment banking firm Keefe, Bruyette and Woods, counseled a more modest approach, such as probing carefully to find profitable niches. "We're not in the business of solving the world's problems; we're in the business of increasing the value for shareholders," he said.

The new capital has emerged in recent years, but its start harkened back at least two decades to Hurricane Andrew, which ravaged the Miami area in 1992.

Today, Zimmermann said, Andrew doesn't seem as though it would have been so important in its day. The insured losses from the storm, $23 billion in today's dollars, pale in comparison to some more recent events like the $47 billion in inflation-adjusted losses from Hurricane Katrina. But Andrew's losses were four times greater than anything that preceded it and far more than anyone predicted.

Andrew's losses were four times greater than anything that preceded it and far more than anyone predicted.

The storm shook the industry. Perhaps the biggest change it brought was a new degree of acceptance of computer modeling. The computer models made catastrophe risk, once the uber-specialty of insurers and reinsurers, easier for others to understand and to price.

Zimmermann recalls the powerhouse reinsurers from those pre-Andrew days: awesome behemoths whose size, customer base and underwriting depth made them seem like impregnable "castles surrounded by the Hudson."

However, now that those models have been honed, capital market investors rely heavily on them as they invest in the property-casualty space. The dominance of reinsurers has ebbed. "There are a lot more companies," Zimmermann said. "Now it's more like a mobile home park surrounded by a creek."

As new capital flows in, the price of reinsurance falls. Panelists agreed that reinsurers have generally responded well to the immediate situation, writing less business as rates have shriveled. Some even practice a sort of arbitrage, writing risks then ceding them into the capital markets at a lower price.

For the long run, reinsurers have responded slowly, Zimmermann said, as have most property-casualty insurers. They are trying to insure an industrialized America that does not exist.

Zimmermann and Mosher agreed that the industry needs to embrace new risks, like cyber liability, while approaching them from slightly different angles. As a company analyst, Zimmermann sees growth as a way for insurers to generate profits. As a rating agency analyst, Mosher sees developing new business as a better deployment of capital than underwriting current business unprofitably.

Shields agreed that companies need to face the changes that are happening and to find ways to benefit. It can take time, he said, to find underwriters who understand new lines of business. "Capital is fungible," Shields said. "Underwriting discipline is not."

The analysts also discussed how the industry has benefited from a decade of low inflation. Standard reserving methods have an underlying rate of inflation built into them; low inflation has allowed companies to improve earnings by releasing reserves from older years as they have proved redundant.

Now, Mosher said, those same reserving methods have low inflation baked into them. An uptick could mean property-casualty company reserves could become inadequate.

Low inflation also means company profits grow more volatile, Shields said. Companies rely less on investment income and more on underwriting income. The investment income mainly comes from bonds, which are stable, while underwriting profits come from the business a company underwrites, which is more volatile. "That itself is a riskier model," Shields said.

Zimmermann agreed; his 40 years as an investment expert means he recalls well the steep price increases of the 1970s. "If you haven't lived in a world of 10 percent inflation," he said, "you can't realize how debilitating it is."

That experience has taught him lessons on how investors view insurance companies. Over his career, Zimmermann has gathered earnings data on insurance markets and the stock market in general, stretching back 60 years. In that time, insurers have returned eight percent on equity. All stocks, measured by Standard & Poor's, have returned 13 percent.

The underwhelming returns have made property-casualty values consistently lower than the rest of the market. The new capital hasn't made the situation easier, he said.

"You can't be in a business with growing competition and expect your stock to do well in the long term," he said. ●

James P. Lynch, FCAS, is chief actuary and director of research and information services for the Insurance Information Institute in New York.

How Will Health Reform Challenge Medical Malpractice? BY JIM LYNCH

Though the impact of the Affordable Care Act (ACA) on medical malpractice insurance remains a bit of a puzzle, three insurance experts pieced together its likely effects at the CAS Seminar on Reinsurance on May 22 in New York.

Forecasting a coherent future from sparse data can be difficult, but it's a skill casualty actuaries have gained through years of experience. There aren't a lot of data yet and the facts that do exist are subject to more political spin than usual. Still, two casualty actuaries and a veteran medical malpractice underwriter were able to use demographic and health industry trends to predict how the medical malpractice world could change over the next decade.

They gave their forecasts in a session titled, "The Impact of the Affordable Care Act on Medical Professional Liability—An Update."

Through early April, seven to eight million people had signed up for health care through insurance exchanges, noted Elke Kirsten-Brauer, executive vice president and chief underwriting officer of MGIS, a leading national insurance program manager for medical professionals. She said about one-fourth did not have insurance before; within a few years, more than 22 million people will gain health insurance.

The mere presence of more insureds will increase the number of medical malpractice claims, Kirsten-Brauer said. Compounding the issue is the fact that they are largely unfamiliar with the health care system.

"These are people who have never gone through the system," she said. "We need to educate them" on matters that will seem trivial.

An example she shared: A patient visits a medical office for the first time. The patient is escorted to an examining room where a nurse checks her blood pressure and leaves. The patient thinks that is the end of the visit and goes home. The doctor never sees her.

Absent any help understanding the system, Kirsten-Brauer predicted, patients like that will be more likely to sue.

Another important trend: The doctor-patient relationship is becoming diluted. The old model of a single doctor diagnosing a patient's problem, then participating heavily at every step of treatment is giving way to expanded care teams.

This is best seen with a new sort of doctor: the hospitalist. As Kevin

Bingham, ACAS, of Deloitte Consulting explained, the term was coined in 1996 and is just now coming into vogue. These are doctors who monitor the hospital stays of patients, a job that the patients' physicians would have taken on in the past.

The hospitalist is part of the new paradigm, with some parts looking familiar but other less so. The physician still diagnoses outside the hospital; the surgeon still operates. But nurses take on larger roles in the doctor's office and the hospitalist picks up medical center duties. The physician re-enters for out-of-hospital follow-up.

Under this new model, patients are far less likely to be treated by a single professional. The series of professionals they move through are part of an accountable care organization, often referred to by its acronym, ACO.

Thanks in large part to the Affordable Care Act, ACOs are growing rapidly. Hospitals are buying small physician practices countrywide, hiring the doctors and nurses, and blending them all into ACOs.

The new model bears a new set of risks for medical malpractice insurers, Bingham said. There can be less continuity of care, as patients are handed off from professional to professional. Patients lose the personal connection to the medical community.

"That's how most med mal claims start," Bingham said, "with a loss of connection with the patient."

On the other hand, as hospitals buy up practices, the market for med mal for physicians shrinks. The exposure shifts to the hospitals that employ them.

Hospitals, being much larger than a physician's practice, will absorb more of that risk, leaving insurers to compete harder for malpractice premiums, said Brian Ingle, FCAS, an executive vice president at Willis Re.

Meanwhile, the ACO will standardize treatment methods. Usually the standardized method will be sound, but occasionally, Ingle noted, it will not. Responsibility could trace back to the deep-pocketed hospital. Suddenly, med mal insurers could be facing a mass tort—at an extreme, the "next asbestos" the property-casualty industry dreads.

In response, Ingle said, insurers are considering expanding their medical malpractice coverage to handle exposures usually left to errors and omissions or directors and officers policies.

While the ACA plays out, important demographic trends also will affect medical malpractice.

- Americans are aging as the baby boom generation reaches retirement age. Older patients often have more complaints, which translates into more care needs in an already overburdened system and an ever-growing provider shortage.
- Physicians are getting older, too, and want to enjoy a better work-life balance, moving down from a 60-hour work week to 45 or so hours.
- Americans are getting heavier, leading to more cases of diabetes and more joint ailments like bad knees and hips.

All of these trends portend higher med mal exposures, Bingham pointed out.

Taken together, the changes mean risk management is more important than ever, Kirsten-Brauer said. Insurers need to use data to promote quality and patient safety and satisfaction. They must adjust their knowledge of the past to meet the exposures of the future.

"We need to train our underwriters and actuaries," she said, and "to challenge them to look at the actual risk exposure" and not just to rely on the tools of the past. "We have to listen to our insureds to meet our challenges." ●

James P. Lynch, FCAS, is chief actuary and director of research and information services for the Insurance Information Institute in New York.

ETHICAL ISSUES

Pricing Insurance for Service Contracts

Ethical Issues is written by members of the CAS Committee on Professionalism Education (COPE). The column's intent is to stimulate discussion among CAS members. Therefore, positions are sometimes stated in such a way as to provoke reactions and thoughtful responses on the part of the reader. Responses are welcomed. The opinions expressed by readers and authors are for discussion purposes only and should not be used to prejudge the disposition of any actual case or to modify published professional standards as they may apply in real-life situations.

Mike N. Tegrity recently earned his FCAS and has been in the insurance industry for six years. His experience mostly involves personal lines pricing. A few months ago, Mike was offered a job as the chief actuary (and only actuary) of We Stand Behind You (WSBY), a new insurer that exclusively writes insurance covering vehicle service contract (VSC) administrator/obligors (AOs).

VSCs, which are not typically regulated as insurance, are sold to customers who purchase vehicles and cover the cost to repair or replace parts that break down or fail for terms typically up to 10 years. However, the coverage provided by the VSC is secondary to the original manufacturer's warranty. The price of each VSC includes a "reserve" portion that the AO sets aside to handle claim payments (similar to pure premium with some expected profit). The AO also purchases a failure to perform (FTP) insurance policy to make sure they have the financial backing to meet state regulations. With an FTP policy, the insurance company only experiences a loss if the AO fails to fulfill its obligations under the VSCs for any reason, most likely because it hasn't set aside sufficient reserves or doesn't have enough capital to pay claims. In calculating loss ratios and monitoring profitability, the AO should earn the collected reserves over the terms of the VSCs in proportion to the expected loss development patterns of the contracts. In pricing FTP policies, the actuary typically looks at the AO's expertise in administering VSCs, the mix of business, its capital position, and the underlying reserve "pricing" of the VSCs. The insurance fee (premium) for an FTP policy is typically set as a percentage of the AO's reserves or a flat dollar amount per VSC, with the price being higher for riskier or poorly capitalized AOs.

With an FTP policy, the insurance company only experiences a loss if the AO fails to fulfill its obligations under the VSCs for any reason, most likely because it hasn't set aside sufficient reserves or doesn't have enough capital to pay claims.

Mike was initially hesitant to take the role of chief actuary, fearing that he didn't have adequate experience. However, Fred Sleezy, the founder and CEO of WSBY, glowingly assured Mike that he was more than qualified for the job. "You're a very bright guy, Mike, and that's why I hired you," said Fred. "And the actuarial work involved in this industry is pretty simple…certainly something that a fully qualified actuary of your stature can handle. What we do is basically provide excess of loss reinsurance on auto service contracts that have been written. The AOs already have reserves, but a few go under here and there, so we need to provide some added insurance. It's really rare that we have to pay a claim though—in the three years we've been in business, we've only had one claim, and it was a pretty small one. Your job is just to come up with a rate for our policies and then to certify that we have reasonable reserves."

As Mike starts his job at WSBY, his first task is to price new FTP policies to be issued. He has read some papers on the subject and feels like he understands the theory. Mike first looks at the pricing of WSBY's existing policies for guidance,

In determining the adequacy of the collected reserves, the AOs are earning their reserves on a pro rata basis, effectively assuming that losses are equally likely to occur at any time during the life of the VSC. This practice goes against everything Mike has read on VSCs.

but is very surprised by what he finds. WSBY is setting its prices based only on the underlying loss ratios calculated by the AOs. In determining the adequacy of the collected reserves, the AOs are earning their reserves on a pro rata basis, effectively assuming that losses are equally likely to occur at any time during the life of the VSC. This practice goes against everything Mike has read on VSCs, so he schedules a meeting with Fred to discuss his concerns.

"Fred, I've been looking over the pricing for our existing policies, and something doesn't seem right to me," said Mike. "The loss ratios calculated by the AOs are based on pro rata earnings, basically assuming that a customer is equally likely to exercise the VSC at any time, but this doesn't make sense to me. Aren't vehicles more likely to break down as they age? And, given that newer vehicles are under a manufacturer's warranty for a few years, the strong majority of losses will probably come from older contracts. I believe the AOs' loss ratios could be significantly understated and it could come back to bite us."

Fred calmly leans back in his chair, begins tapping his fingers together, and responds, "That's an excellent question, Mike. Yes, we do see that a bit, though not as much as you think. Cars these days aren't built like they used to be, so I think we'll see both older and newer cars breaking down. Plus, we have policies written a few years ago that cover older vehicles, and we have incoming policies covering brand new vehicles, so in the end it's all a wash. Do you follow?"

Mike is thoroughly confused by Fred's answer and isn't sure how to respond. After thinking for a minute, Mike asks, "Is it possible for me to talk to the actuary who used to have this job?"

Fred immediately shoots back, "No, I don't think that's possible. He's moved on and we shouldn't bother him with this. If you have any questions on the pricing, though, you can just ask me. While I'm not an actuary, I have been in this business for over 20 years."

Mike replies, "Yes, but WSBY has only been around for three years. We have yet to see most of the VSCs we're insuring expire. The results that the AOs are reporting to us are probably distorted and if some AOs go under years from now, it could be too late to stop the bleeding. I believe we and the AOs need to use a different approach for the new policies. Then, we can take another look at the existing policies, starting with the AOs covering mostly newer vehicles. That would make me feel much more comfortable with my work."

Fred immediately dismisses the idea. "If it ain't broke, don't fix it, right?" Fred says. "This approach has worked well for us in the past, and again, I've been doing this a long time. I don't expect you to understand everything in your first few weeks on the job, but you'll get the hang of it. For now, just follow my direction and everything will be fine."

As Mike returns to his office, he is unsure of what his next step should be. He doesn't understand Fred's approach and has become distrustful of his motives. Among the alternatives available to Mike, consider the following options:

1. Mike should resign from his current position. It's clear that he is not ready for this job and that the motives of the CEO are questionable at best.
2. Mike should tell the CEO that he can only propose rates and sign off on reserves that he believes are adequate. Unless WSBY is willing to price its policies correctly, Mike cannot issue actuarial opinions stating that WSBY's procedures are appropriate. If that means losing his job, then so be it.
3. Mike should seek guidance from the ABCD on how to proceed.

A Day at the Crash Testing Lab

STORY AND PHOTOS BY DAVE CORE

Last May I spent a day at the testing center for the [Highway Loss Data Institute of the Insurance Institute for Highway Safety](). Kim Hazelbaker, senior vice president for the Highway Loss Data Institute, spoke with me during a tour of the facilities.

Located in Ruckersville, Virginia, 90 miles south of the CAS office, the Insurance Institute for Highway Safety's Vehicle Research Center is a state-of-the-art facility for crash testing of passenger vehicles. Funded by over 90% of the insurance industry and currently undergoing a huge expansion, it has led the way in automotive safety for 20 years with its highly touted vehicle ratings system, which involves conducting up to five crash tests on new vehicles.

Its newest test, the small overlap front test where only 25% of the front of the vehicle strikes the barrier, is its most stringent and highlights that even the top-rated vehicles have opportunities for improvement. Vehicles with advanced accident prevention systems are tested on its outdoor track.

Dave Core, CAE, is the CAS director of professional education and research.

(1) Kim Hazelbaker (right) shows a young visitor the roof testing area.
(2) and (3) Two Chryslers, equipped with driver-side airbags, from an actual crash in 1990 in Culpeper County, Virginia. Both drivers walked away.
(4) A side-impact test vehicle.
(5) Hazelbaker shows a 1959 Chevy Bel Air, tested to commemorate 50 years of crash testing. It fared poorly when it struck a 2009 Chevy Malibu.

Photo courtesy of the Highway Loss Data Institutes.

(6) Prepping 2015 VW GTI for a small overlap front test.
(7) The central barrier test area.
(8) The long hallway to get cars up to speed.
(9) The moment of maximum deformation is shown. This vehicle did well on the small overlap front test and Volkswagen was very pleased, according to Hazelbaker.

EXPLORATIONS BY GLENN MEYERS

The Table M Problem

In retirement, I find myself occasionally looking back at old projects and thinking, "If I knew then what I know now, what would I have done differently?" This column tells of one instance where I would now do things differently.

One of my early projects was on retrospective rating, a rating plan where the final premium was determined after the expiration date by a function of the total losses incurred by the insured. One might think of it as an aggregate stop loss policy as this function usually included a maximum premium.

The rates for these plans were calculated using Table M, a table of aggregate excess pure premium ratios. This table, promulgated by the National Council on Compensation Insurance (NCCI), recognized that as the risk size increased, the relative volatility of the aggregate loss distribution decreased. Risk size, as measured by the standard premium, was the table's only input.

As I was gathering information for the project, I got a challenge from one of our underwriters who said that he did not like to write high-severity risks on a retrospective rating plan, stating that, "One can lose many years of small profits with a single large claim." This begged the question: "How much should you charge a high-severity risk on a retrospective rating plan?" At my company, I was able to get claim severity data and use the collective risk model to incorporate claim severity into our pricing of retrospective rating plans.[1]

Because of my company work on retrospective rating, in 1979 I was invited to join a small NCCI working group to construct a new Table M. The other members of the working group were Roy Morell and Rob McAuley. The data we had to work with consisted of thousands of standard premium and loss records from individual workers compensation policies. Taking claim severity into account was not an option. Our final product was an interesting exercise in curve fitting and data smoothing. I learned a lot from our efforts. As our work was proceeding, I was constantly cross checking our Table M analysis with my company model.

The most important lesson we learned from that work was that the so-called "law of large numbers" had its limitations. We could see in the NCCI data that while the relative volatility tended to decrease with risk size, there was a limit as to how low it could go. No matter how big the risk, there was always some volatility in the loss ratios. After a lot of discussion, we did manage to formulate a model that allowed for parameter uncertainty.[2] But as Roy Morell put it in his discussion of my paper, "There is still a lot of uncertainty in measuring parameter uncertainty." In the end we made a judgmental pick and moved on. Parameter uncertainty was recognized in both the 1980 Table M and my company model.

Thirty years later with a lot more model building experience under my belt, an exciting tool for quantifying parameter uncertainty (Bayesian MCMC modeling software) and knowledge of the Tweedie distribution, I took another look at the problem. While I no longer have access to the NCCI or my company loss data, I believe I came up with simulated data that could resemble real data. It consisted of 5,000 observations, with pure premiums (PP) ranging from $1,000 to $5,000,000, and a simulated total loss.

The model I selected is a Bayesian Tweedie[3] loss model with the following parameters and prior distributions.

The most important lesson we learned from that work was that the so-called "law of large numbers" had its limitations.

[1] Early versions of the model were described in my 1980 *PCAS* paper "An Analysis of Retrospective Rating," http://casact.org/pubs/proceed/proceed80/80110.pdf. Later versions of the model made use of my 1983 *PCAS* paper written with Philip E. Heckman, "The Calculation of Aggregate Loss Distributions from Claim Severity and Claim Count Distributions," http://casact.org/pubs/proceed/proceed83/83022.pdf.
[2] An account of this analysis is in my *PCAS* 1983 paper, written with Nathaniel Schenker, "Parameter Uncertainty in the Collective Risk Model," http://casact.org/pubs/proceed/proceed83/83111.pdf. See also Roy Morell's discussion at http://www.casact.org/pubs/dpp/dpp82/82dpp301.pdf.

Figure 1

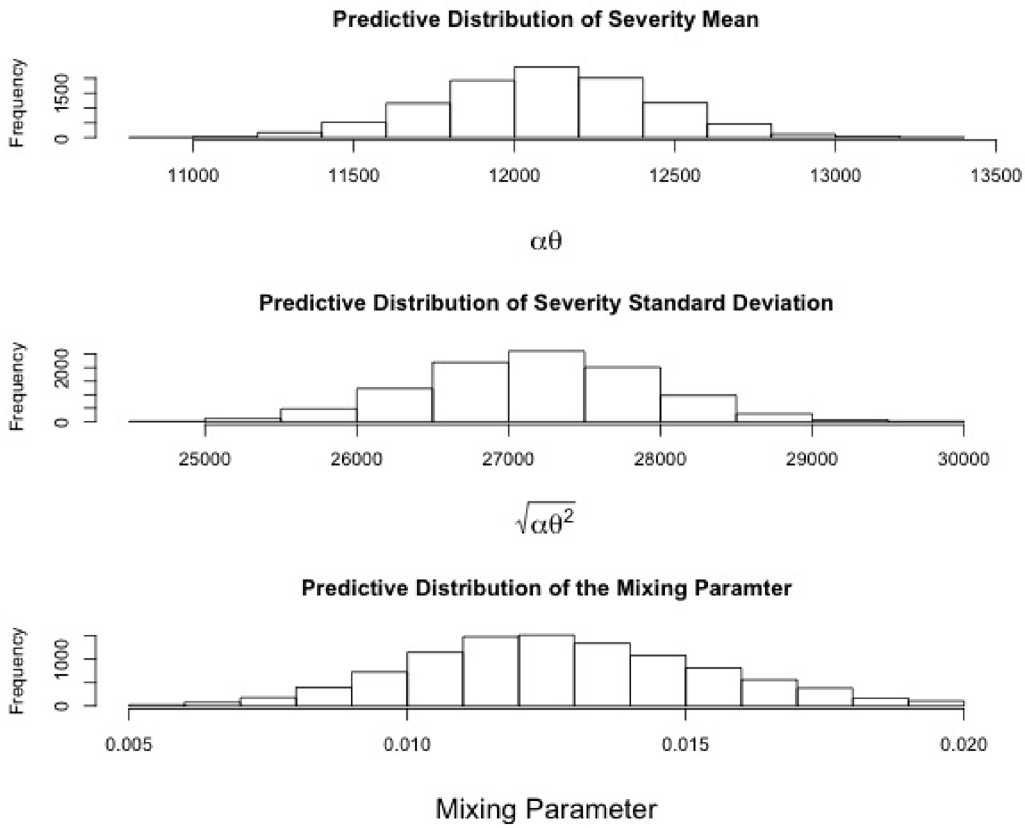
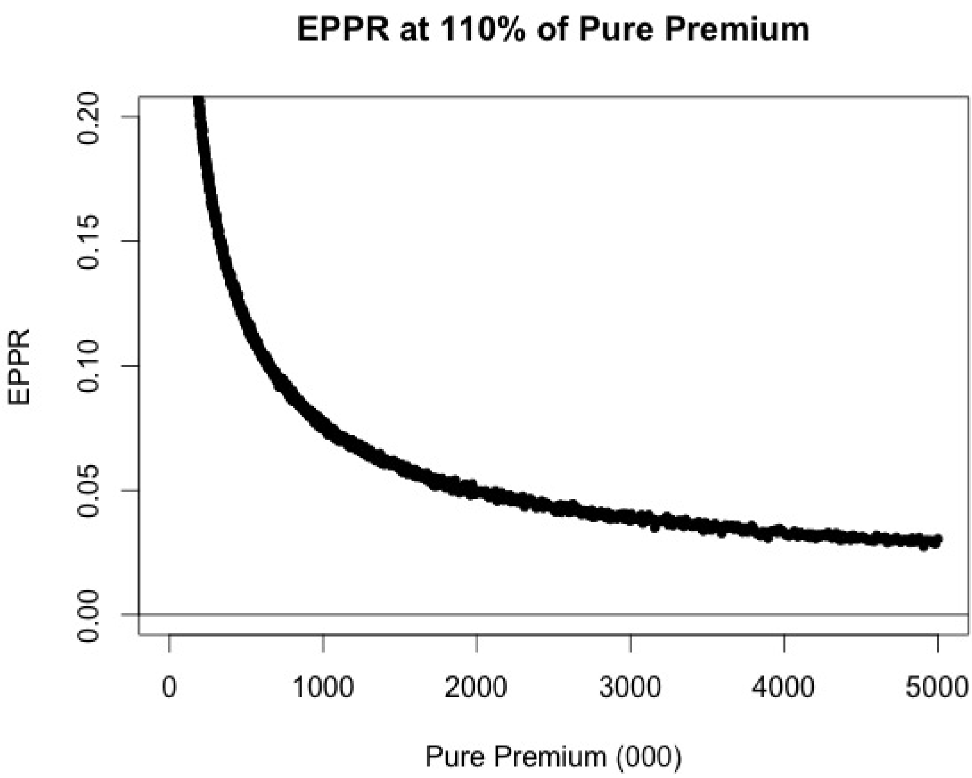


Figure 2



- $Z \sim \Gamma(100{,}100)$ — the expected claim severity.[4]
- $\alpha \sim Uniform(0.1{,}0.2)$ — the shape parameter of the Γ claim severity distribution.
- $\Theta = Z/\alpha$ — the scale parameter of the claim severity distribution.
- $m \sim$ Uniform(0.005, 0.02) — a random mixing parameter.
- $M \sim \Gamma(1/m, m)$ — a random multiplier with mean 1 and variance m.
- λ= PP • M / Z — the expected claim count.
- $Y \sim$ Tweedie(λ, α, Θ) — the total loss.

There are two points to make about this model.

1. We do not observe individual claim severity in the data. When we do the Bayesian MCMC estimation, what we will get is a posterior distribution of a claim severity distribution with parameters that are consistent with the prior distribution and the variability of the total loss data that we observe. The estimation will give a posterior distribution of severity parameters for any reasonable prior distribution, but the better the prior distribution, the better the posterior distribution.
2. The random multiplier, M, injects parameter uncertainty into the expected loss. How much parameter uncertainty depends upon the mixing parameter, m. This parameter is itself uncertain and its posterior distribution is estimated from the data.

Using the Bayesian MCMC model[5] that is in the R/JAGS script that accompanies the web version of this article, I generated a sample of 10,000 (α, θ, m) parameters from the posterior distribution. Using these parameters I plotted the posterior distribution of the mean and standard deviation of the claim severity distribution and the posterior distribution of the mixing parameter m. The histograms for these distributions are in Figure 1.

Next I calculated the excess pure premium ratios (EPPR), i.e. the expected cost for losses in excess of 110% of the pure premium divided by the pure premium, for each observation. Figure 2 plots these ratios against the pure premium. If the law of large numbers held for the data, the excess pure premium ratio would approach zero. We can see from Figure 2 that it appears to approach a positive limit. I calculated that limit to be 0.014 for a very large risk.

In Exhibit 1, one can see that the model quantifies Roy Morell's "uncertainty in measuring parameter uncertainty" and using the large sample in the posterior distribution, we can incorporate this uncertainty in our EPPR estimates.

It is not clear from this exercise with simulated data that this kind of analysis with real data will run as smoothly. But if I were working on the Table M problem today, this is where I would start.

If I were working on the Table M problem today, this is where I would start.

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[3] The Tweedie distribution is a compound Poisson distribution, with expected claim count, λ, and a $\Gamma(\alpha,\theta)$ severity distribution. See my February 2009 *Actuarial Review* column, http://www.casact.org/newsletter/index.cfm?fa=viewart&id=5756.

[4] A $\Gamma(a,b)$ distribution has mean = ab and variance = ab^2.

[5] I have often written about Bayesian MCMC models in the Actuarial Review. See, for example, my column in the May 2012 issue at http://www.casact.org/newsletter/index.cfm?fa=viewart&id=6352.

Inside *Variance* BY DONNA ROYSTON

Readers will find some interesting papers in the coming issue of *Variance* 7:2.

A discussion paper by Michael G. Wacek presents a reaction to "Capital Tranching: A RAROC Approach to Assessing Reinsurance Cost Effectiveness" by Mango, Major, Adler and Bunick, which was published in *Variance* 7:1.

"Bayesian Claim Severity with Mixed Distributions" by Benedict Escoto presents a Bayesian technique for adjusting a mixed exponential severity distribution in response to partially credible observed claim severities. The paper presents two applications: pricing excess of loss (XOL) reinsurance layers and computing increased limits factors (ILFs). The paper's Bayesian model uses a Dirichlet distribution over the mixed exponential's initial mixture weights. The posterior distribution, produced by conditionalizing on the observed claim severities, is computed using a Markov chain Monte Carlo method.

"A Flexible Framework for Stochastic Reserving Models," by Roger Hayne discusses maximum likelihood estimators as a powerful statistical tool. The paper deals with nonlinear reserving models, without the need to transform those models to make them tractable for linear or generalized linear methods, also showing how the same general approach can be easily adapted to provide estimates for a very wide range of reserving methods and models, making use of the same framework and even much of the same computer code.

"Tail-Related Risk Measures of Extreme Value Distribution: The Case of Taiwan's Rice Damage Due to Typhoons in the Non-Crops Insurance Plan" by Li-Hua Lai and Pei-Hsuan Wu adopts the extreme value and VaR approach to investigate the amount of rice damaged due to extreme events and analyzes the collective risk model as a feasible scheme for estimating annual aggregate losses. The results are that the annual frequency of rice damage caused by typhoons is shown to fit well the Poisson distribution with one parameter. Generalized Poisson distribution allows easy estimation of the high quantiles and the maximum probable loss from the data. The threshold value can be used as reference in decision making for setting grant-in-cash relief. The authors believe that, given different confidence intervals, these high-quantile measures can provide useful information in reviewing the applicable loss compensation regulations and for adjusting natural disaster relief budget plans or insurance pricing on the non-insurance plan.

"Case Studies Using Credibility and Corrected Adaptively Truncated Likelihood (CATL) Methods" by Harald Dornheim and Vytaras Brazauskas build upon two previous papers, which introduced a new likelihood-based approach for robust-efficient fitting of mixed linear models, and further explore how CATL methods can be used for pricing risks. Dornheim and Brazauskas extend the area of application of standard credibility ratemaking to several well-studied examples from property-casualty insurance, health care and real estate fields. The process of outlier identification, the ensuring model inference and related issues are thoroughly investigated on the feature data sets. Throughout the case studies, performance of CATL methods is compared to that of other robust regression credibility procedures. ●

Donna Royston is CAS publications production coordinator.

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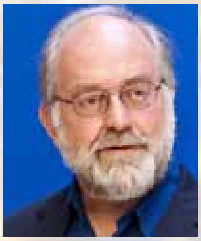


Keynote Address: Redefining Risk in a Future World where Technologies are Hell-Bent on Eliminating It

Thomas Frey, Executive Director and Senior Futurist, the DaVinci Institute

Author of the 2011 book *Communicating with the Future*, futurist speaker Thomas Frey is a powerful visionary who is revolutionizing our thinking about the future.

As the Executive Director and Senior Futurist at the DaVinci Institute, he works closely with his Board of Visionaries to develop original research studies, which enables him to speak on unusual topics, translating trends into unique opportunities.

As part of the celebrity speaking circuit, Tom continually pushes the envelope of understanding, creating fascinating images of the world to come. His keynote talks on futurist topics have captivated people ranging from high-level government officials to executives in Fortune 500 companies including NASA, IBM, AT&T, Hewlett-Packard, Lucent Technologies, First Data, Boeing, Capital One, Bell Canada, Visa, Ford Motor Company, Qwest, Allied Signal, Hunter Douglas, Direct TV, International Council of Shopping Centers, National Association of Federal Credit Unions, *Times of India*, and many more.

Because of his work inspiring inventors and other revolutionary thinkers, the *Boulder Daily Camera* has referred to him as the "Father of Invention." *The Denver Post* and *Seattle Post Intelligencer* have referred to him as the "Dean of Futurists."

Before launching the DaVinci Institute, Tom spent 15 years at IBM as an engineer and designer where he received over 270 awards, more than any other IBM engineer. He is also a past member of the Triple Nine Society (High I.Q. society over 99.9 percentile).

IN MY OPINION BY GROVER EDIE, *AR* EDITOR IN CHIEF

Big Data, Big Data Errors

We have entered a new era of big data.

We are also in the era of big data errors.

Not everything you find on the Internet or read about on any of several social media sites is true. In today's digital world, anyone can be a publisher, and many are.

I need to remind myself that the aggregation of data into consolidated places can also result in the aggregation of erroneous information.

I recently spent some time on the phone with one of the credit reporting services. In this case I was dealing with a data aggregator concerning some underwriting information they had provided my insurance company. I was disturbed to find that they reported that I:

- Was leasing two cars that my wife and I had always owned. (Oddly, one "lease" was on a 2000 model year car that we bought in 2000. The lease would have had to run for about 14 years in order for that report to be correct.)
- Had listed two extra drivers (my son and his wife) and their cars in a "vehicle musical chairs," erroneously mixing up drivers and automobiles.

Errors such as these could have even prevented me from getting insurance in the first place or caused my rates to be much higher than they should have been.

The gentleman I spoke with was polite and willing to take my corrections at face value. However, he informed me that it would take at least 30 days before I received a corrected report.

I got the "revised" report for the claims and driving history last week but most of the items were unchanged. They did state "disputed" on the side but there were no real corrections. There were now some new errors, so I called the vendor and asked what the next step should be to get them corrected. "We'll get back to you," was the reply. I am still working on that issue.

How many in the general population check their credit report? One survey reported that one quarter of the U.S. population has never checked or asked for their credit report.

I also checked my credit report for accuracy. I know that I should have obtained the annual free credit report and then contacted the credit reporting agency to make sure the credit report was accurate but how many of us do that? It certainly is not on the top of my list.

How many in the general population check their credit report? One survey reported that one quarter of the U.S. population has never checked or asked for their credit report.[1]

Another source indicated a similar finding. The study, from the Consumer Financial Protection Bureau, found that only 22 percent of consumers accessed their credit report in 2010 and 2011.[2]

My wife and I are at a point in our lives where we are not looking to buy or mortgage another house, finance a new car or apply for a college loan. I have been ignoring my credit reports to my own peril.

I didn't pay much attention to them until my wife started asking questions about our insurance rates and our insurance score. She wanted to understand how our credit rating and our insurance score were related to what we pay for insurance. I think I got a taste of what the insurance agents deal with every day with their clients.

Stepping outside my personal credit and insurance score issues and beyond the underwriting report problems, I started thinking about how we, as actuaries, use that data. Clearly, there were some problems with what had been reported about my own situation and I guessed I was not the only person whose information was not accurate.

Then I thought about the Actuarial Standards of Practice (ASOP) and how they might fit into all of this. I read ASOP 23 on data quality and thought about my company's use of the insurance scoring

[1] http://company.findlaw.com/press-center/2013/nearly-a-quarter-of-americans-have-never-checked-their-credit-rep.html
[2] http://files.consumerfinance.gov/f/201212_cfpb_credit-reporting-white-paper.pdf

data and analysis provided by our vendor/supplier. I wanted to take another look at their data quality statements.

Then I took a look at ASOP 38, "Using Models Outside the Actuary's Area of Expertise," but didn't find much to be concerned about in that standard. At least I got some continuing education hours by reading it.

It would be nice if we could be certain that our vendors apply the same standards to the data they provide us. Some likely do, but until we can verify that, we should limit the influence such sources have on our work, as a "credibility of the data" approach of sorts.

I recall Raffa's book *Decision Analysis*, which used to be on the exam syllabus. He differentiated between the expected value of perfect data and that of imperfect data. With respect to the latter, perhaps we should limit the amount of influence it has on our analysis and our rates.

In the meantime, I'll keep trying to get the data in my own situation corrected and remember the errors I encountered when I perform pricing analyses. ●

IN MY OPINION BY ROB LIEBERTHAL, PH.D., CAS ACADEMIC CORRESPONDENT

More on the Actuarial Implications of the Affordable Care Act

I enjoyed reading the article "Connecting with students—online and in person" by Wayne Fisher (President's Message, *AR* May-June 2014). As Mr. Fisher notes, current issues can have a powerful impact across a number of lines of insurance. I would strongly second his view that "the Affordable Care Act…is not just about health insurance." I envision the Affordable Care Act as a law that has the potential to transform the entire U.S. healthcare delivery system, primarily through the vehicle of healthcare finance and reimbursement.

The Affordable Care Act was based on the recognition that, for a large share of the U.S. population, affordability is a major impediment to access to care. In other words, those who do not have health insurance will often struggle to pay for medical care. The issue goes deeper than that. As Steven Brill recently highlighted in *Time* ("Bitter Pill: Why Medical Bills Are Killing Us," March 4, 2013), insurance companies negotiate prices for care on behalf of their members. Thus, those without insurance must pay for care out of their own pockets and are typically charged a higher price than those with health insurance. The Affordable Care Act addressed this issue in large part through the expansion of health insurance, using the existing Medicaid program and newly created health insurance exchanges (also known as health insurance marketplaces).

Where should we expect to see the effect of this law? Certainly, any lines that involve the price of care. Beyond that, we should re-examine our assumptions of the trend (growth rate) in overall medical spending that many actuaries use regularly. Thus, the risk for long-tailed lines of insurance may be particularly acute, as I pointed out in a past issue of the CAS *E-Forum* ("International Evidence on Medical Spending," CAS *E-Forum* Spring 2011). This is an area where data will be limited for the time being, since the Affordable Care Act is only four years old, and the law's provisions have been, and will continue to be, rolled out in pieces over time.

The fact is that this policy has important spillover effects for other parts of the insurance system. While it is satisfying to produce an analysis with a single number (one right answer), it is more accurate to produce multiple estimates associated with different types of scenarios. Scenario planning, simulation, and other techniques could provide a range of estimates associated with a specific insurance product. Then, the changes associated with laws like the Affordable Care Act need to be communicated in a way that recognizes nuance and uncertainty.

This will certainly challenge the actuaries of the future to describe these changes while still maintaining a high degree of skill in technical aspects of actuarial work. As a member of the academic community, I look forward to partnering with students and those in the insurance industry to ensure that how these skills become an integral part of our educational system. ●

Rob Lieberthal, Ph.D. is an assistant professor at the Jefferson School of Population Health in Philadelphia, PA. He can be reached at robert.lieberthal@jefferson.edu.

In the "No"

I recently had the pleasure of attending a talk by Amity Shlaes, author of *The Forgotten Man* and *Coolidge*. Shlaes pointed out that Calvin Coolidge created economic growth in the U.S. by cutting both tax rates and government spending. Coolidge reduced the national debt from $22.3 billion to $16.9 billion; the top income tax rate dropped from 73% in 1921 to 24% in 1929; and the federal budget was reduced from $5.1 billion to $3.3 billion. He vetoed 50 bills, 30 by "pocket veto" which cannot be overridden. Shlaes pointed out that although Coolidge was a man of few words, he was quite adept at saying "no."

This got me to thinking about the importance of being able to say "no" when saying "yes" is often much easier. As actuaries we do some of our most important work when we say "no" as in, "No, those loss reserves do not make a reasonable provision for liabilities" or "No, 5% per annum is not an appropriate assumption for short-term interest rates." As managers of people we can frequently achieve better results by an honest "no" than by a dishonest "yes." "No, this analysis is not sufficiently professional" followed by specific and constructive criticism is of more value than the acceptance of marginal work. And an appropriate "no" can be a sign of true leadership: "No, I didn't do it myself, John helped me a lot" or "No, it wasn't my idea, it was Mary who came up with it."

Those of us who have known the joys and challenges of parenthood are well aware of the difficulty, and necessity, of saying "no." Of course the difference between the parental "no" and the managerial "no" is that no amount of logic can justify the former. And, of course, we need to teach our children when to say "no." And not just the daughters.

We don't say "no" often enough. Agreement is so much simpler. Disagreement requires well-reasoned argument. Saying "no" can be seen as heartless, even when it is actually just. Saying "yes" is safe. Saying "no" to a CEO, for instance, can be detrimental to one's career. Of course saying "yes" to a bad idea can kill a career as well.

We don't say "no" often enough. Agreement is so much simpler. Disagreement requires well-reasoned argument. Saying "no" can be seen as heartless, even when it is actually just.

So, when should we say "no?"

First, we should say "no" when it is the honest answer. If we can't support an idea, we should not agree with it. If we believe a proposal is wrong, we need to say so, regardless of the expressed opinions of others. The best leaders don't want to be surrounded by toadies!

We should say "no" to establish boundaries, be they behavioral or dealing with rate adequacy. If there are no boundaries, there can be no extremes. We need to be able to say "this far and no further."

We should say "no" to avoid overload. They say "if you want something done, give it to a busy man," but if the acceptance of an additional assignment is likely to reduce the quality of our other work products, we must refuse.

We should say "no" to focus on priorities. That board seat for the opera group may do wonders for our egos, but if it will likely interfere with work or family obligations, it must be refused.

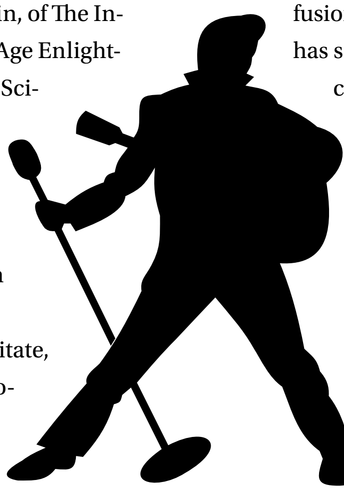
We should say "no" to defend good sense. We should avoid getting involved in silly causes. A petition to make Thursdays "vegan days" at the cafeteria is not likely to be an achievement noted at our wake.

Finally, if the proposal is one which takes something from someone, even if it is in order to give it to someone else, we should greet that proposal with a resounding "no." Milton and Rose Friedman said in *Free to Choose,* "There is all the difference in the world, however, between two kinds of assistance through government that seem superficially similar: first, 90 percent of us agreeing to impose taxes on ourselves in order to help the bottom 10 percent, and second, 80 percent of us voting to impose taxes on the top 10 percent to help the bottom 10 percent." We should say "yes" to generosity but "no" to larceny. Calvin Coolidge would agree. ●

IT'S A PUZZLEMENT BY JON EVANS

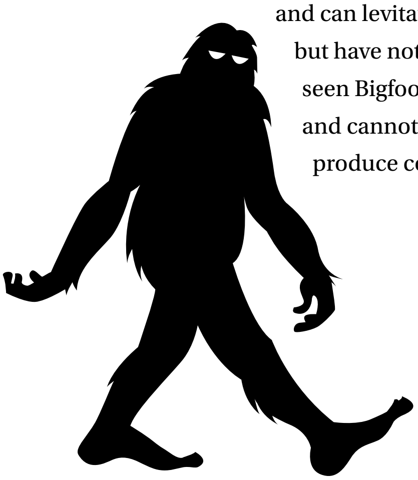
Paranormal Logic

Dr. Pons Vallee Martin, of The Institute for the New Age Enlightened Reform of the Scientific Method, has come to the following conclusions:



a) Everyone who saw Elvis last year has seen Bigfoot.
b) If someone cannot levitate, that person cannot produce cold fusion.
c) If someone has ESP, that person can produce cold fusion.
d) If someone saw Elvis last year, that person does not have ESP.
e) Everyone who can levitate and also has seen Bigfoot has either not been abducted by a UFO or cannot produce cold fusion.
f) Everyone who has not been abducted by a UFO has not seen Bigfoot.

Is it possible, according to Dr. Martin's conclusions, that there are people who have been abducted by a UFO and can levitate but have not seen Bigfoot and cannot produce cold fusion? Could anyone who has seen Bigfoot produce cold fusion?



Don't Run Over the Bicycle

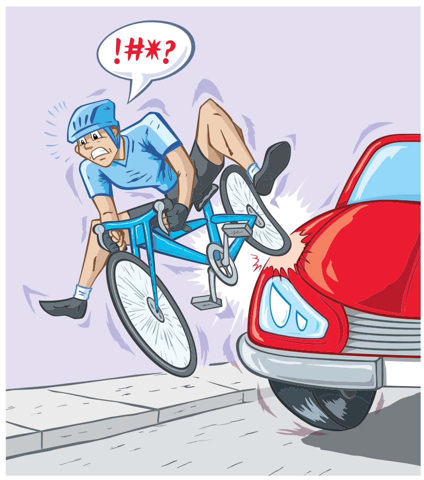
The puzzle was as follows: On a clear dark night, you are driving your car with your headlights on along a narrow but straight country road. A stopped bicycle 30 meters away, with no lights of its own, no reflectors, and a rather dull paint job, would be visible with 10 times the minimum brightness for you to notice an object. Suppose you are driving 30 meters per second and need to notice any such stopped bicycle at least two seconds in advance to safely avoid a tragic collision. Can you safely avoid a collision with such a stopped bicycle? If your headlights had totaled 100 watts of power, what would be the minimum headlight power to have four seconds of advance warning?

Since there are no shiny, mirror, or glossy surfaces, all light reflected from the bicycle will be reflected diffusely or scattered. Light emitted from the headlights declines in intensity as $1/d^2$, where d is the distance from the headlights to the bicycle, and light reflected off the bicycle also declines in intensity as $1/d^2$. This leads to the famous "radar equation" whereby the intensity of radiation received back at the source of emission declines as $1/d^4$. Note: This is why long-range radar units tend to consume so much power, often getting really hot and requiring their own cooling equipment!

The intensity of reflection the car driver sees is 1/16 as great at 60 meters as at 30 meters. Since the bicycle was 10 times minimum visible brightness at 30 meters, it will only be 10/16 of minimum visible brightness at 60 meters. So, the driver, driving at 30 meters per second, will have less than two seconds to react to the bicycle and likely not be able to avoid a collision.

At four seconds before collision the car is 120 meters away and the brightness of the bicycle is 1/256 as great as at 30 meters, or 10/256 of minimum visible brightness. If headlight power had been 100 watts, then 2560 watts would be needed for four seconds warning.

A solution was submitted by Brad Rosin. ●



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