The
Actuarial Review

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CAS President Pat Teufel (left) presents the 2010 Variance *Prize to Dumaria R. Tampubolon at the 2012 CAS Spring Meeting in Phoenix. Ms. Tampubolon shares the award with Gary G. Venter for their paper "Robustifying Reserving," which is published in* Variance *Vol. 4, Issue 2.*

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The 2013 CAS Spring Meeting is scheduled for May 19-22, 2013, at The Westin Bayshore Vancouver in Vancouver, Canada. Contact Megan O'Neill at moneill@casact.org or (703)562-1742 for details on sponsorship opportunities. AR

CAS Social Media Outlets Surpass 5,000 Followers

Thank you to all of our fans! The CAS Facebook, Twitter, and LinkedIn pages have reached over 5,000 followers with the help of your support! Make sure to join in the conversation, post articles, and send us your feedback. Remember this is an online community to support you—our fans!

We 👍 you, too! AR

What Employers Demand: Integrity. Insight. Innovation.

Whatever our course in life, there will be challenges. The ultimate measure of our success is not how we handle the peaceful moments of our lives, but where we stand during times of challenge and controversy. A winning course, I believe, is to keep focused on the long-term vision for the future, while meticulously executing the short-term agenda.

This philosophy has been my guidepost as I have executed my responsibilities as CAS president. The operations of the CAS—administration of basic education and examinations, design and delivery of continuing education offerings, advancement of research, building and maintaining relationships with other actuarial organizations—can be daunting and are certainly a key component of the job. To be effective, each facet of our operation requires the direction and oversight of dedicated leaders—staff and volunteers. One could easily be sidetracked by the myriad issues involved in managing an organization of the CAS's size and complexity! I strive to be a leader who keeps her focus on the longer term, steadfast in moving the organization forward. To that end, this year I have tried to focus my attention on enhancing the value that CAS members bring to their employers and principals.

The value that our members bring to their employers and users of actuarial services will ultimately ensure our continued success. To ensure this success, the CAS needs to listen carefully to the views of employers, principals, and regulators. While the CAS credential may be a requirement for certain positions or roles, it is generally not sufficient. Employers demand more.

As an employer of actuaries, I expected that candidates would possess fundamental skills. In addition, I wanted professionals working for me to demonstrate three key attributes: integrity, insight, and innovation. Where individuals delivered these standards, they excelled—regardless of their exam status.

Integrity

Our principals and employers see us as trusted advisers. We need to measure up to their trust.

The CAS Code of Professional Conduct is fundamental to our work as actuaries and defines the standards for how we conduct ourselves as professionals. It sets us apart from others; it communicates to our principals what they can and should expect. Employers can rely on our Code in setting the "tone at the top," incorporating the Code in internal controls considerations. Business schools are just now recognizing what we have known for some time—wherever there is uncertainty in outcomes, it is critical that ethics training be integrated into the curriculum. Our CAS Course on Professionalism is perhaps the most important training that the CAS provides to our candidates and members. As I told a recent Course on Professionalism class, each of us can expect to experience at least one defining moment in the course of our careers. Those moments won't be decided by the technical training we have mastered, but by how we handle the ethical aspects of our work.

Insight

As an employer, the educational background that I expected from my actuaries was much broader than that tested in our examination process. It was a given that actuaries would be able to apply accepted actuarial methodologies to business issues, but their value came from being able to orient the application of those methodologies to solve business issues. An understanding of the business was essential, and often a missing factor for those candidates who breezed through the exams before gaining work experience. Only when actuaries are able to translate our analyses so that they can have business impact will the real value of our educational process be deployed.

The CAS continues to rely on an apprenticeship format for our education, which combines book learning and testing with practical work experience. This two-faceted approach to education, where the CAS partners with employers of actuaries, has been successful to date. But, as we grow geographically and contextually, we must find new ways of ensuring that all of our candidates can test their ability to offer practical business solutions. Adoption of a formal mentoring program by the CAS could help here.

The integrating of business perspective with actuarial techniques is leading to new roles for actuaries in product management. Increasingly, predictive modeling forms the basis for pricing decisions, but these results also need to be interpreted and refined from a business angle. Even when actuaries are not directly responsible for performing the predictive modeling, they have a role in interpreting the results with a critical business eye and in communicating the limitations of the models.

Applying our actuarial education need not be confined to insurance and insurance-related settings. For example, I volunteer within a private-school system that was experiencing a drop in overall enrollment. Initially they believed that

From the President, page 6

The Wisdom of Transformation

Dear Editor:

As the CAS approaches its 100th anniversary, it is interesting to note that its very existence (as we know it) is under scrutiny. This seems particularly ironic given the history of the CAS, which has shown itself to be a model of adaptivity.

Rather than being complacent under the onslaught of technology and analytical advance, in recent years, we have integrated the best of what has been developed outside of our profession. ERM, DFA, GLM, neural networks, variance and complexity structures, credibility and risk classification schemes, and cat bonds are just examples of advances casualty actuaries have added to their toolboxes. Our field has always expanded to meet the needs of the dynamic issues we have faced. It has also stayed true to its roots.

In 1972 when I became a Fellow, the CAS had a few hundred members. Most of the 300 or so Fellows knew each other. The sense of intimacy formed in those early years has remained a part of our organization. Unlike the SOA, we are still close enough to our non-bureaucratic roots that we can celebrate individual achievements that move the profession forward.

The contingencies we model are among the most complex of all the applied sciences. I believe we are just beginning to realize the benefits of being part of a spry and nimble organization. Any dramatic action that would compromise the creativity and ingenuity which emerges from the intimacy of our group would be a great loss for us, our constituents, and society as a whole.

This is not about good and evil. It's about the wisdom of transforming another institution that has so much to offer in its emerging form. Let's think long and hard about how best to proceed.

—Lee Smith, FCAS

Come to Work with Me

Dear Editor:

I read Mr. Edie's piece ("In My Opinion: Come to Work With Me," May 2012 *AR*) with some curiosity about what message he would communicate. What he described is fairly typical of life high up in big bureaucratic organizations. Still, I was amazed that he did not say a word about results, achievements, teamwork, all the things that make a successful organization tick and worth spending your working life in. A big salary and a large office are not what matters. I had the luck of working with, and ultimately succeeding, Jack Byrne in completely transforming a few such insurance organizations into places where "partners" come to work every day to look for ways to improve what is in place and to find new ways to create more value for shareholders. No consultants, few meetings, plenty of debate, but one agenda. Sure, there are plenty of travel, relocations, changed vacations, employee issues, etc., but these are not "the job," just part of what is needed to achieve results. Even the disasters are useful. I would encourage up-and-coming actuaries to look for performing companies or change others into performing ones. There are places where you can have fun and maybe even get rich.

—Ray Barrette, FCAS

CAS Webinars Offer Cost-Effective CE Opportunities

Looking for opportunities to gain continuing education (CE) credit? Check out the Webinars offered by the CAS! Topics presented this year have included "Optimal Pricing," "Using Analytics to Improve the Claims Process," and "Data, Documentation, and Disclosures (COPLFR)." The Webinars have been well attended and have received positive reviews since their start in 2007. A wide variety of subjects will be covered by the Webinars throughout 2012.

Webinars are great ways to get organized CE credit without leaving your office. Many of our Webinars focus on prevalent professionalism topics. The CAS Web Site, as well as the weekly e-mails, will have information on registration and Webinar content. Be sure to consider CAS Webinars when planning your continuing education for 2012.

The CAS Webinar Committee works with presenters to develop educational opportunities that are timely and useful, all at a reasonable cost. If you would like to recommend topics for future Webinars, please send an e-mail to meetings@casact.org. We would love to hear from you!

Implementing a New Ratemaking Approach

Editor's Note: This article is part of a series written by members of the CAS Committee on Professionalism Education (COPE). Its 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 readers. 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 modify published professional standards as they may apply in real-life situations.

John is an FCAS in charge of personal lines pricing for We Care, a mid-sized insurer. He and his team have recently completed a personal auto class plan analysis. We Care has used traditional actuarial methods in performing previous class plan reviews, but John decides to enhance the current review by incorporating a GLM approach.

After running a series of GLMs, exploring variable interactions and transformations and inspecting model diagnostics, John develops a class plan that he believes is actuarially sound. However, his proposed rating structure would be a significant departure from the current one. Among other things, John finds that the good student discount, which currently is an additive factor, should be multiplicative (which will lead to less of a discount in most cases). He also finds that, due to an interaction between driver training and demerit points, less of a discount should be offered for driver training than is currently being offered. While John realizes that he may face resistance for proposing such radical changes, he is confident in his work.

Before presenting his results to senior management, John schedules a meeting with David, his counterpart in underwriting. David is not an actuary and is only somewhat familiar with actuarial methodologies, but he has many years of experience as an underwriter and John knows that David's opinions carry significant weight with senior management. Upon seeing the proposed rating plan, David's initial reaction is that he believes it will hurt profitability. We Care's finance department recently conducted a detailed analysis of profitability by segment and found that married people between the ages of 45 and 65 who live in the suburbs are one of the most profitable classes of insureds. While John's proposed plan would likely have a small direct impact on such insureds, it will generally result in higher auto rates for their teenage children. "How can we hope to keep over-protective yuppie suburban parents if we raise their kid's car insurance rates by slashing the discount for the driver training they spent good money on, and tell them that their little angel's stellar report card is only worth a small discount?" David asks.

John reruns the analysis using the traditional approach (which is a minimum bias procedure) and obtains rating factors similar to those in the current manual. However, John still believes that the GLM approach is actuarially and statistically superior. He meets again with David to try to convince him that the GLM approach is indeed better, but David remains unconvinced. He counters that he is ultimately concerned with making the best business decisions for We Care and, while actuarial considerations are a component of that process, other considerations matter as well. In this case, David argues, he cannot support an actuarial analysis that will hurt profitability. David further informs John that, if John decides to present the GLM results to senior management, he will aggressively argue against implementing John's proposed plan. While John still believes that the GLM approach is superior, he also recognizes that he will have a very difficult time convincing senior management of this, especially given David's opposition. Moreover, John recognizes that presenting the GLM results will upset David, which will likely lead to a tenser work environment and could even hurt John's career advancement prospects. At this point, what are John's professional obligations? Among the alternatives, consider these:

Option 1

Other than documenting his work, John's only professional obligation is to present the GLM results to senior management. He is not obligated to advocate implementing the results of the GLM approach—he can simply present both the GLM and minimum bias results as competing alternatives and let management decide which method should be adopted.

Option 2

John is professionally obligated to present the GLM results to senior management and to fully explain why he believes the GLM approach is superior, even if doing so harms his

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the retention issues were the result of the current economic environment, and they were adopting strategies to ride out the storm. Using a standard development triangle, the schools saw that retention had been an issue for some time, with students most at risk during natural transition periods (pre-kindergarten to kindergarten, elementary to middle school, middle school to high school). This insight led the school board to develop and adopt enhanced enrollment management processes.

Many have suggested that the CAS should expand the actuarial footprint beyond insurance and financial services. While I am all for such an expansion, members should recognize the investment that they'll need to make. Only if our members gain an understanding of these new businesses and the risks inherent in those businesses can we hope to be successful in expansion. Just as the risks inherent in casualty insurance operations are different than those of life and pension insurers, so too are the business fundamentals different for other industries.

The discussion of new horizons leads naturally to a discussion of the third key attribute that I valued as an employer: innovation.

Innovation

Our world is constantly changing; as actuaries, we too need to change. Intellectual curiosity is key to that change—curiosity that will lead us to refine our methodologies and hone our assumptions. Curiosity will take us outside of our natural environs to learn from others. Innovation is also fundamental to the CAS mission to advance casualty actuarial science.

We must be open to advancements occurring outside our normal sphere of influence, and consider adopting them in our work. That's how catastrophe modeling began, and predictive modeling has been another success story for adaptation!

What materials are on your current reading list? What kinds of seminars do you attend and which sessions do you go to? Do you make it a point to explore areas outside your natural comfort zone, and consider the applicability of that work to your business?

I attended an educational session at the most recent IAA Council meeting on environmental risk (climate change). The views of the non-actuary—a biologist—were particularly stimulating for me. Her interest in environmental risk stemmed from a project in Africa where she helped a community, whose primary industry was farming, adjust to soil erosion. While the project was very successful from a biological standpoint (the community harvested a robust crop of tomatoes), export restrictions severely hindered the marketing of the tomatoes. In her current work, she consults with several departments in the U.S. government on environmental issues. She talked about jurisdictional silos, data quality, and health aspects of her work. She certainly broadened my views on the role of actuaries in this important global topic! Also interesting was the fact that she connected with the actuarial community quite by chance. Her seatmate on a flight out of DC happened to be an actuary who knew of the climate change working group and suggested both sciences might benefit from greater collaboration. (You never know the opportunities that business flights can present!)

Harvard Business Review featured an article recently titled "*HBR*'s List of Audacious Ideas." The article suggests that difficult times are a time for audacity, not austerity. Bold ideas represent real business opportunities. So, where do you think the best opportunities lie for you, as an individual member and for the Society? The CAS has increased its budget for research substantively in recent years, but are we investing enough? Today, our research budget represents approximately 5% of annual revenues. This seems a modest investment when research is one of our primary missions. So, what are your audacious ideas for the CAS, and how much of an investment should we be making in those ideas?

These have been challenging times for the CAS, but they are also exciting times—times of great opportunity. Let's be audacious in our vision for the CAS!

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relationship with David. John rereads the actuarial professional guidance documents and notices:

- Principle 3 of the Statement of Principles Regarding Property and Casualty Insurance Ratemaking, which says "A rate provides for the costs associated with an individual risk transfer."
- The Statement of Principles on Risk Classification, which says that a sound risk classification system should "reflect expected cost differences."

Given that John believes the GLM approach is superior to the traditional one, how can he justify presenting anything other than that to the ultimate decision-makers? And if he does hold back based solely on fear of upsetting a colleague, how can John defend himself against a charge that he is in violation of Principle 1 of the Code of Professional Conduct (acting "honestly, with integrity and competence")?

GARY R. JOSEPHSON, CAS PRESIDENT-ELECT

Reinvigorating the CAS

Having just spent the better part of a week with my three-year-old granddaughter Anna, I couldn't help but think about the changes that have taken place in all aspects of our lives since the time my kids were her age. And one can only guess at the changes that will take place between now and the time that Anna's kids are three. Change is a constant in our lives, and we need to adapt accordingly.

A number of years ago, I attended a presentation by Dan McCarthy, a former president of the American Academy of Actuaries (and well known to many casualty actuaries as a leader of the actuarial profession). Dan advised that to be successful, actuaries need to periodically reinvent themselves. With the pace of change in many of the things that affect our jobs—technology, regulations, competition—what served us well when we got our ACAS or FCAS is not likely to be sufficient for tomorrow's challenges. We need to continually enhance our skills, both technical and other, in order to continue to bring value to our employers, clients, and publics.

With the pace of change in many of the things that affect our jobs—technology, regulations, competition—what served us well when we got our ACAS or FCAS is not likely to be sufficient for tomorrow's challenges.

Dan's advice can also be applied to the CAS. We need to be able to change in response to our environment. One of our main goals as an organization has always been to be a leader in education and research for casualty actuaries. As our world became more global, we expanded our vision to become a resource to other general insurance actuaries around the world. As risk management continued to evolve, we recognized that our skills as actuaries allowed us to make unique contributions in areas that went beyond the traditional property and casualty risks.

These changes have been driven by opportunity. Changes are also driven by threats. There is no question that the SOA's planned entry into the general insurance space creates a threat to the CAS. Competition is not new to the CAS. As our reach has spread beyond the conventional areas of ratemaking and reserving, we have clearly overlapped into areas in which other professionals may take some ownership (e.g., predictive modeling and ERM). The CAS's role in responding to these competitive threats is to provide our members with the capacity to leverage our knowledge of insurance and risk with the tools that are continually emerging to measure these risks.

Clearly, the SOA threat is different, since it addresses the core of our being, the education of casualty actuaries. How do we respond? I believe that we start by recognizing where we are today. Our basic education, while it will have its occasional road bumps, provides the most comprehensive education for casualty actuaries in the world. Our continuing education offerings are unparalleled. Our research continues to focus on practical applications of emerging science. And, not to be forgotten in all this, our membership dues are the lowest among the three largest actuarial organizations in the U.S.

However, we cannot just assume that our current position will sustain itself. In her May 2012 *Actuarial Review* column, Pat Teufel expressed that as an organization we are threatened by a sense of complacency—being too slow to innovate and adapt to change. As the "only game in town," this may have been a natural response. However, in our current environment, it is a recipe for obsolescence. We need to respond to the SOA challenge by considering this an opportunity to reenergize our activities in all of our operational areas. We need to consider alternative ways of educating future members (not as a means to water down the credential, but to recognize that options may exist to improve the process). We need to continue to deliver continuing education on relevant and cutting-edge topics, and in innovative ways. We need to push the edges of research, perhaps by creating stronger ties with academia.

Dan advised us to reinvent ourselves, but the CAS doesn't need to do that. Why reinvent something that has served us so well? What we need to do is *reinvigorate* ourselves. Let's be creative in thinking of ways to enhance our skills, our tools, our products, and ourselves. Let's stop saying "we have never done it that way." Let's use our 100-year head start to leapfrog from where we are today to where we need to be in the future.

First Comes Exams, Then Comes Marriage

Couples who are actuaries can be common within CAS membership. One such couple is Andrew Maxfield and Julie Zambrano of Illinois. At the 2012 CAS Spring Meeting, they completed an exam journey in which they were recognized at four consecutive CAS meetings achieving ACAS and FCAS credentials. Mr. Maxfield and Ms. Zambrano met at State Farm where they both still work. "We're actually sort of part of an actuarial coupling boom that happened in our department," Mr. Maxfield said. The couple found shared support by going though the exam process simultaneously. Mr. Maxfield was always one exam ahead, so they studied independently. Working toward the same ultimate goal helped them stay on track. Ms. Zambrano said, "There was no guilt about staying in on a Friday night to study instead of heading out for the evening, because it was something we had to do to reach our goals."

Associate and Fellowship recognition took the pair from D.C. to Palm Beach to Chicago and, finally, to Phoenix. While they enjoyed different aspects of the CAS meetings, Phoenix is their consensus favorite. Mr. Maxfield preferred Phoenix because he could finally relax, knowing that they both had finished the years of hard work. With work completed they can now turn to other endeavors. Ms. Zambrano is giving back to the CAS by volunteering for the Joint Committee on Actuarial Diversity.

ZR Weddings.

Andrew Maxfield and Julie Zambrano on their wedding day.

Mr. Maxfield and Ms. Zambrano celebrated completion of the exam process by getting married on June 23. In addition to their profession, they share similar eccentricities like watching movies with the subtitles turned on and a mutual disdain for spelling errors. Their only salient difference is seafood: Ms. Zambrano is allergic while Mr. Maxfield loves it. "This more or less works in my favor because I don't have to share my halibut," he said.

Get General Business Skills Training Online

The CAS will now offer general business skills training online through a new agreement with BizLibrary. Whether it be training in communication, leadership, supervision, management, or strategic planning, BizLibrary has a course for the interested participant. CAS members will receive a 10% discount for each online course, which generally lasts up to 90 minutes. Members may also purchase 5-, 10-, or 20-course bundles to receive additional savings. Single courses from BizLibrary's e-Learning Library cost $80 USD and single courses of streaming video are $54 USD. The courses may count toward members' general business skills continuing education credits.

BizLibrary is the nation's leading provider of e-Learning and blended learning solutions and platforms for small and mid-sized organizations. The company offers a comprehensive package of employee training and development products and services. Their offerings include thousands of industry-leading, off-the-shelf courses, a hosted learning management system, an integrated authoring tool, and a dedicated team of service professionals who customize, implement, and integrate solutions to drive business results and return on investment for their client partners.

BizLibrary
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SMALL & MID-SIZED COMPANIES

For the initial period, this training will be offered to CAS members in the U.S. and Canada. Based on interest in this new service, the options may be expanded to our international members. To find out more, please visit University of the CAS at www.casact.org.

New UCAS Sessions Available

The University of CAS (UCAS) offers recorded sessions that were presented at CAS meetings, seminars, and Webinars. The recordings, which feature audio synched with PowerPoint presentations, are available online through an easy-to-use interface.

New sessions are being added constantly, and most recently sessions from the 2012 Spring Meeting and 2012 Reinsurance Seminar have been posted, including:

- Applying Optimization Methods in Ratemaking
- Auto Safety Advances: Will They Shrink the Auto Market?
- Current State of the Reinsurance Market
- Global Economic and Insurance Market Outlook
- The Next Big Thing in Insurance Coverage
- Price Optimization vs. Actuarial Standards
- Recent CATs and Their Effects on CAT Modeling
- Reinsurance Evaluation using Capital Tranching

Access to sessions is free for respective Spring Meeting and Reinsurance Seminar attendees. This extends the value of event registration by allowing attendees to benefit from sessions they were not able to attend on-site. Access by individuals who did not attend the Spring Meeting or Reinsurance Seminar can be purchased for $25 per session.

UCAS includes a section of entirely free sessions, such as research paper presentations and sessions on CAS issues. Click UCAS Free Content on the main navigation bar to access the complimentary sessions.

Sessions are also available from the 2012 Ratemaking and Product Management Seminar and from Webinars held this year.

Visit the University of CAS at http://cas.confex.com/cas/ucas12/webprogrampreliminary/start.html to learn more. At UCAS, education is just a click away! AR

Education is Just a Click Away

25 Years Ago in the *Actuarial Review*

A Fine Puzzle—Hands Down!

By Walter Wright

Twenty-five years ago John Robertson printed a very clever puzzle, which I remember well. Like many classic puzzles, it seemed impossible at first but with a little thought a very simple solution emerged easily. Here it is:

Shake Hands

This month's puzzlement was suggested by Orin Linden. Recently Orin and his wife gave a party and invited four other couples. As guests arrived, Orin noticed that each person shook hands (once) with every person he or she did not know, but did not shake hands with anyone he or she already knew. In particular, no spouses shook hands with each other. After all the guests had arrived, Orin asked each person how many hands he or she had shaken. To his surprise, he got a different answer from each person. The puzzlement is to tell how many hands Orin's wife shook. (Don't assume that Orin's wife knew all the guests.) AR

The Liquidity Risk Premium Project*

By Dilip Madan, Shaun Wang, and Philip Heckman

As actuaries, we earn our living chiefly by placing values on liabilities and, to a lesser extent, on assets. These liabilities may be prospective, as in contracts that have not yet been entered into, or existing, as reserves for in-force or expired contracts. Our colleagues in life insurance may be called upon to value assets consisting of long series of prospective premium payments. In many or most cases, these liabilities and assets may settle many years in the future. Actuaries have developed considerable expertise in estimating and characterizing the cash flows involved (although a full stochastic description of loss processes is still a work in progress). But cash flow estimation is only part of the task.

Aggregating the cash flows to a single amount accurately expressive of their current value is an operation that puts us all at loose ends. Regulators and policyholders will prefer a valuation basis that is uniform across the industry, maximizing transparency. Management will prefer a basis reflective of the enterprise's peculiar cost structure. Investors in the financial markets will prefer a basis that faithfully reflects the risks inherent in the business and the prospect of a satisfactory return. Accounting bodies have been leaning strongly toward the financial view for the past dozen years or so, proposing mark-to-market and fair value accounting based on the market asset values or model-based estimates thereof. It is becoming clear that, despite numerous problems and unanswered questions, the markets will have the final say and that valuations of monetary promises must somehow connect to the broad financial markets. How and to which markets are questions that have not yet been answered to our satisfaction.

An example of such a problem is the paradox that arises when liability values are tied to the countervailing asset values, leading to an increase in equity on a credit downgrade. No sense beyond the olfactory is required to determine that this is wrong, but one is still obliged to put something in its place that smells better. It was to this end that the CAS Committee on Theory of Risk sponsored the Liquidity Risk Premium Project recently carried out by Dilip Madan, University of Maryland; Shaun Wang, Georgia State University; and Philip Heckman of Heckman Actuarial Consultants. In order to explain what liquidity has to do with the problem, some background is in order.

The theory of financial economics has enjoyed brilliant successes over the past decades employing a parade of assumptions such as Gaussian random walk, equilibrium, efficient markets, elimination of arbitrage, market clearing and the law of one price. All of these have limited validity and tend to be imposed widely in situations where they have not been verified. We will focus first on the law of one price, which states that an instrument trading in a market that clears will transact for a unique price at any given time in both directions, be it a purchase or a sale. This is supported empirically in two kinds of situations: (1) for equities traded on an exchange, where trading information is abundant; and (2) where counterparty risk is eliminated by surety or by margin requirements, as in commodity exchanges.

The essential condition for the law of one price to hold is market liquidity—the ability to buy and sell promptly and without extra cost. If there is any illiquidity, time, effort and cost will be required to find a counterparty and to conclude a trade, and the market will not clear in a timely fashion. We suggest that most markets, especially those for which data are spotty and that have not been studied closely, behave in this fashion; that is, they are *incomplete*. For such markets, the familiar description, such as that which leads to the CAPM, is inadequate.

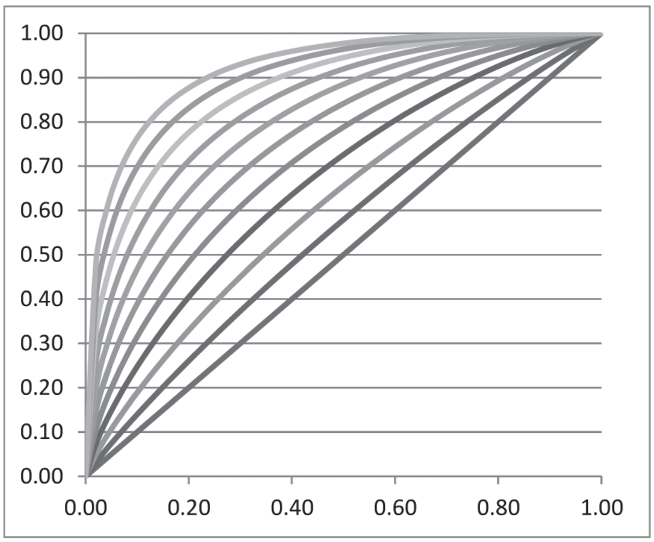
Professor Madan has devised an alternative description using a two-price model for the economy. The two prices are the bid and the ask. The market is described as a passive intermediary for all trades, which buys at the bid, sells at the ask, and holds the spread to compensate for illiquidity risk. He has done so using two ingredients that have been in the advanced actuarial toolkit for some time: (1) the theory of coherent risk measures as formulated by Artzner et al. and expounded by Glenn Meyers on these pages in August 2002, and (2) the theory of probability distortions as formulated by Shaun Wang (See *e.g., Journal of Risk and Insurance,* March 2000) and others.

A familiar example of a coherent risk measure is the TVaR which, applied to the probability distribution describing a financial position, returns the conditional expectation in excess of a given probability threshold. Unfortunately, the probability threshold—the percentile—is not a market observable and means different things in different contexts. In 2010, Cherny and Madan showed that the TVaR integrated over a unit density

* All citations and references are to be found in the documents available at http://www.casact.org/liquidity/.

on the unit interval is again coherent and is equivalent to an expectation on the probability which has undergone a concave distortion. An example of such a distortion is the Wang transform: $\psi_\lambda(F(x)) = \Phi[\Phi^{-1}(F(x)) + \lambda]$, where Φ is the standard normal distribution function. This gives back the original distribution when the parameter $\lambda = 0$ and places greater emphasis on adverse outcomes as λ increases through positive values. We show it here on the ordinate for arguments in [0, 1] on the abscissa and parameter values 0 to 2 by increments of 0.2.

Figure 1



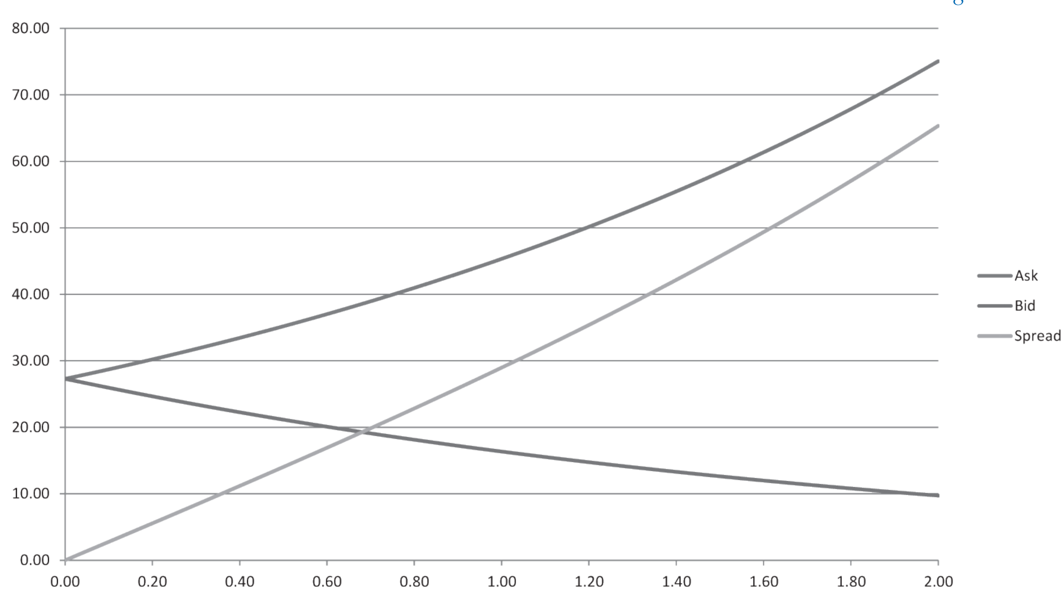
Here we have described a position where larger outcomes are favorable. Adverse outcomes are at the low end and are assigned higher probability for larger parameters.

If $F(.)$ is taken as the risk neutral distribution function for the position, then the distortions yield bid and ask prices for all positive values of λ. In the language of coherent risk measures, λ increases with the size of the set of acceptable test measures and thus measures the acceptability of the position in the current market. The bid and ask prices are given by

$$b_\lambda = \int_{-\infty}^{\infty} x \, d\psi_\lambda \left(F(x)\right); \quad a_\lambda = \int_{-\infty}^{\infty} x \, d\psi_\lambda \left(1 - F(x)\right).$$

In a simple illustrative model, bid and ask prices and the spread look like the following in Figure 2.

Figure 2



The distortion parameter is a proxy for acceptability. At the left end, bid and ask converge at the market clearing price. If the market does not clear, the appropriate values are found on the continuum. The point is that the bid and ask prices are market observables (while probability thresholds are not). Matching model values to actuals, where available, tells us what distortion to use in pricing any position for which we have a stochastic model.

In principle, this finding liberates the art and science of valuation from the tyranny of the law of one price. In simple terms, assets can be valued at the bid and the corresponding liabilities at the ask, resolving the valuation paradox because credit and other risks peculiar to the entity are subsumed under liquidity risk. The spread gives us frictionless market values for the cost of unwinding the position, the capital required to support the position, and the cost of surety to neutralize the position. There are many details to be dealt with, but we hope that this approach can gain currency, realizing the long-desired goal of market-based valuation without crippling paradoxes. Please go to the link in footnote 1, and have a look.

The authors wish to thank the CAS, the Committee on Theory of Risk and its chair, Richard Derrig, for their support and guidance in the course of this work.

Dilip Madan is a professor of finance at the University of Maryland's Robert H. Smith School of Business. Shaun Wang is the Thomas P. Bowles Chair of Actuarial Science in the Department of Risk Management and Insurance for Georgia State University's Robinson College of Business. Philip Heckman is the president of Heckman Actuarial Consultants, Ltd.

Actuaries Can Help Insurers Understand the Complex Challenges of Climate Change

PHOENIX—Climate change is steadily increasing the exposures that insurers face and actuaries can take the lead in helping companies understand the threat, according to experts speaking at the CAS Spring Meeting held May 20-23, 2012. In a panel discussion moderated by Vijay Manghnani, FCAS, who chairs the CAS Climate Change Committee, three presenters laid out the threat of climate change to the planet generally and insurers specifically.

A climate scientist presented the case for climate change and blamed the impeded acceptance of the threat on political affiliations and skewed media coverage. A casualty actuary described the potential insurance exposure and how professional standards can help actuaries properly price the growing risk. And a state insurance commissioner discussed how regulators have looked at the issue and what they can do to address it.

Professor Andrew J. Weaver, a climate scientist at University of Victoria in British Columbia, laid out the facts considered by climate scientists who overwhelmingly believe the planet has been getting warmer and will continue to do so, largely due to human activity.

Despite the fact that more than 95% of climate scientists agree about the direction and causes of climate change, the American public is skeptical. American beliefs on climate science change, literally, with the weather. Polling data show the percentage of Americans believing the Earth is warming peaked at 72% in 2008, then drifted down to just over 50% in 2010. It rose to 62% in 2011, most likely thanks to a remarkable string of tornados and other weather disasters. In contrast, about 80% of Canadians believe climate change is occurring, and the percentage doesn't change much, Dr. Weaver said.

Still, there's no doubt the planet is warming, as the phenomenon is well-documented according to Dr. Weaver, who said public opinion polling on whether temperatures are rising is really asking: "Do you believe in thermometers?"

Politics lies at the root of American skepticism, he said. Public belief in climate change follows political lines: in 2011, 69% of Democrats agreed the Earth is warming, compared to 41% of Republicans.

Dr. Weaver also blamed poor communications for the skepticism. Scientists have been too wrapped up in the technicalities and jargon of climate science to clearly communicate the issue.

Journalists wrap the issue in sensationalism ("Oceans Rising 150 Ft." blared one headline Dr. Weaver presented), which makes readers skeptics when they realize the news is overblown. Or the media give undue exposure to skeptics, he said.

One researcher looked at U.S. "prestige media" (*New York Times*, for example) and found that more than half of news reports gave equal emphasis to the scientific consensus and to climate-science skeptics. Only 6% of reports unequivocally stated the scientific consensus that humans contribute to global warming.

Insurers will face growing exposures as the planet heats up and weather becomes more volatile, said Tanya Havlicek, ACAS, an actuary with Marsh Captive Solutions who specializes in environmental science issues.

Insurers have been surprised by environmental exposure before, she said. In the 1970s and 1980s, growing understanding of pollution issues led to laws that required polluters to pay for the pollution they caused. Often, that fell to the insurer that issued the polluter's general liability policy. Insurers were stuck paying billions of dollars in losses for a new exposure with evolving liability. The situation is similar with climate change today, she said. Awareness of the issue is growing, social attitudes toward it are changing, and there is legal and legislative uncertainty in dealing with it.

The obvious exposure is to property insurance: more volatile weather means destruction from more storm events and wildfires. But liability coverages are also at risk, Ms. Havlicek said, pointing to the recent case *Kivalina vs. ExxonMobil Corp. et al.* In the case, the court ruled that insurers do not have to indemnify or defend a climate change lawsuit. (Kivalina is an Alaskan village that sued a host of companies, alleging their pollution caused the warming that has the ocean buffeting the community.)

That case and others continue to work through the court system. Companies are retaining the risk, even if it has yet to be recognized, quantified, or mandated, Ms. Havlicek said. Actuaries need to understand that and price accordingly—and the traditional actuarial models might not do the trick.

Standard actuarial practice involves using trends from the past to project into the future. But climate science indicates the future will not be like the past. In other words, frequency and severity won't follow traditional patterns, and the variability of losses will grow.

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What the Future Holds for Actuaries

PHOENIX—The future of the actuarial profession and the public's view of actuaries were among the topics discussed at the concluding session of the 2012 CAS Spring Meeting. Participating in the discussion were Alice Underwood, FCAS, an executive vice president at Willis Re; Mark Vonnahme, clinical professor of finance at University of Illinois at Champaign-Urbana, and Steven Armstrong, FCAS. They have a unique perspective as current or former volunteer leaders within the CAS, but the opinions they offered were their own.

The panel agreed that the profession is changing, with heightened competition arising from various sources. At most insurance companies, actuaries have been thought of as the numbers experts. But as insurers look deeper into their databases for a competitive edge, they've hired more "quants"—newly minted graduates with advanced math or statistics degrees who build sophisticated predictive models. The models are designed to help price and manage a company more effectively.

Actuaries can respond to this by adding to their skill set, even after they have passed all of their exams, according to Mr. Vonnahme. While some actuaries will become predictive modelers, those who don't will still have a role to play by using their insurance knowledge and communication skills in important ways. Two things actuaries can bring to the table, according to the panelists are:

- Professional standards/Code of Ethics: Non-actuaries may not have these (at least in the formal sense). The partnership between modelers and actuaries can be a beneficial one.
- Intermediary role: Actuaries can develop "a way to frame a problem" that modelers can understand, Ms. Underwood said, and then help management understand the modelers' analyses.

Actuaries also play a valuable role in ERM, a discipline that has grown over the past decade as companies have tried to deal with the risks they face in a holistic manner. The ERM role is an interdisciplinary one, Mr. Vonnahme said—one that actuaries can fill, particularly in insurance, where their specialized knowledge is strongest. With their training, actuaries would seem well suited to key ERM roles, such as chief risk officer. But actuaries haven't always been at the forefront of the new discipline, Ms. Underwood said. That may change, as the CAS becomes one of several actuarial organizations conferring the new Chartered Enterprise Risk Analyst (CERA) designation. Outside of insurance, however, the competition gets thicker, with other professions offering their own risk management credentials.

The panelists agreed that, while within the insurance field the role of the actuary is well known and respected, there is a struggle for recognition outside the industry. "It's a PR issue more than anything else," according to Mr. Armstrong. Outside the insurance field, he said, actuaries need to show they have the skills to justify the higher salaries they typically command. "We have to be more proactive in marketing ourselves in a way we haven't done before," Mr. Vonnahme added.

Panelists agreed that competition would make the CAS stronger. The organization is re-evaluating what it does "with some sense of urgency," Mr. Armstrong said. "The CAS is taking this opportunity and will run with it in a way that's going to be really impressive."

For a profession that spends most of its time forecasting the effects of future events, the CAS would seem well-equipped to make the most of this opportunity.

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To respond, she said actuaries will have to develop new models to address the changing climate. They may need to adapt data from non-insurance sources into their work. Actuaries' professional codes foresee situations like these, Ms. Havlicek said. She noted that professional standards of practice allow actuaries to give non-insurance data more credibility if it is warranted. Failing to do so will leave actuaries and their companies with inappropriate rates and inadequate reserves. Extreme failures could end in insolvency, she said.

Regulators, too, want to make sure insurers understand their exposure, said Washington Insurance Commissioner Mike Kreidler.

"We always have a keen interest in having healthy companies," he said, adding that regulators can consider exposure to climate change in their examinations of insurers, regulate companies to handle the risk appropriately, educate the public about the risk, and encourage insurers to share their expertise in risk modeling to enhance understanding.

Insurance regulators surveyed insurers in 2010 and some,

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Predictive Modeling Transforms Insurance Pricing

PHOENIX—Predictive modeling will continue to revolutionize the way insurance policies are priced, casualty professionals were told during a 2012 CAS Spring Meeting session titled, "The Revolution and Evolution of Predictive Modeling." Claudine Modlin, FCAS, a senior consultant at Towers Watson, laid out how far predictive analytics has advanced insurance pricing in the past decade. Steven Armstrong, FCAS, presented a variety of ways those same tools and skills could improve insurance operations beyond the pricing function.

At the end of the 20th century, insurers were bound to mainframe computers and highly aggregated data sets, which led to unsophisticated rating plans easily understood by competitors. Today, insurers use a variety of predictive analytic tools to hunt through large data sets to find variables that hold clues to individual customers' riskiness and purchasing behaviors. Generalized linear models (GLMs) have become the global industry standard for pricing segmentation, due in large part to the multivariate framework, the multiplicative nature of rating plans, and the high degree of transparency in the results.

As insurers follow the information revolution, they are improving the quality and accessibility of their internal data, investigating third-party data sources, and investing more computing power to harness the information. To properly analyze the data, actuaries must assess a large list of related variables to search for potential predictors. Doing so requires more refined methods, and according to Ms. Modlin, "Within the GLM exercise, modelers use a blend of statistical diagnostics, practical tests, and our business acumen to select predictive factors."

Despite the many refinements to loss cost calculation, however, the use of science to understand customer demand lags behind. Mr. Armstrong pointed out that "you have this pricing tool kit, [but one should] think beyond pricing," to help solve business problems. The next evolutionary stage for pricing sophistication is for companies to learn to *integrate* their cost estimates with knowledge of customer behavior. This can involve scenario-testing possible rate changes and measuring the effect on key performance indicators, taking the effect of customer behavior into account.

During the presentation, Mr. Armstrong remarked that predictive modeling can affect underwriting, marketing, sales, and claims functions as well. Examples include:

- Helping determine which workers compensation risks should be tapped for a premium audit.
- Researching what mix of social media grows the customer base or what brand attributes drive new business.
- Searching for the best locations for agency placement.
- Managing expenses and employee longevity.
- Analyzing claims for potential fraud and increased severity.

The list of areas where actuaries could help insurers quantify and understand their operations seems limitless, Mr. Armstrong said. "Wherever there is data, there is opportunity."

To listen to a recording of this and other 2012 Spring Meeting sessions, visit the UCAS http://www.softconference.com/cas/.

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including those in Washington, are surveying them again this year. Results showed that companies have varying approaches to exposures created by the issue.

Mr. Kreidler emphasized that regulators want insurers to understand the risk today so they can handle it without overreacting, such as leaving the market once the exposure is obvious to all.

No one wants to repeat the situation in Florida, where issues surrounding hurricane risk have caused insurer participation in the market to shrink until the state-run insurer of last resort, Citizens Property, is the largest homeowners insurer. Some states could require companies to offer property insurance in "vulnerable areas."

Regulators can also help, he said, by understanding that this exposure means insurance prices could rise. "We have to work together," Mr. Kreidler said, "not just as actuaries and regulators. The last thing we want to see is companies leaving markets."

School Board Politics

Peter Murdza at school.

When his oldest child was about to enter first grade, Peter Murdza attended his first school board meeting in Hanover, New Hampshire. He was concerned about a proposal to cut back the school budget. He decided to run for the board, and was elected to a three-year term in 1996. The school district for Hanover's middle and high schools, known as the Dresden district, is somewhat unique, as it crosses state lines, taking in Norwich, Vermont. Congress must approve such districts. The law creating this particular district was part of the last one signed by President Kennedy before his assassination. At the time, the district also included the small towns of Lyme and Orford, New Hampshire.

All seven members of the Hanover school board, plus four of the five members of the Norwich school board, form the Dresden school board, reflecting the relative populations of the towns. Peter served for a time as chair of both the Hanover and Dresden budget committees.

As a school board member, Peter was involved in a number of controversies. When he was first elected, a 23-member school administrative unit (SAU) represented five districts and four towns. At a district meeting with a low turnout, Hanover voted to withdraw and form a new SAU with Norwich. Peter was the lone dissenter on the boards. He urged an effort to work out the differences with Orford and Lyme, saying it could be a tactical error to separate from those less-wealthy towns if the New Hampshire Supreme Court were to order redistribution of school tax burdens in a pending lawsuit, challenging the adequacy of state aid to education. The chair of the committees that had studied withdrawal for many months rushed to the microphone, almost pushing Peter off the podium, to say he was "appalled" and "disgusted" by Peter's alleged last-minute objections.

Another time, the SAU board had voted to censure a member from Lyme who had released a document marked "confidential" to the local paper. In it, the superintendent had outlined to the chairwoman from Lyme what terms he would consider acceptable to serve for a year as interim superintendent. That was before the board considered the matter. Peter requested that the board find out what censuring means and how it should be done. Nevertheless, the board voted 16-1 for censure, with Peter abstaining.

Peter applied his insurance background to an issue regarding students who began the year in the Hanover or Dresden District, but whose families later moved out. The existing policy was that if students moved out after a specified date, e.g., sometime in April, they could finish the year in the district without paying the tuition charged to out-of-town students. If they moved out prior to the specified date, they would be responsible for the proportion of the school year remaining times the annual tuition charge. So, if the tuition was $10,000, a day or two could end up costing, say, $2,500. To eliminate the sharp jump, Peter proposed that a disappearing deductible would apply. If the cutoff date was the day when one-quarter of the year remained, then someone leaving before that date would pay 4/3 times 10,000/180 (the length in days of the school year) times the number of days from the day they moved out of the district to the cutoff date. So, if the cutoff date was April 15 and they moved out five school days earlier, they would pay 10,000/180 x 5 x 4/3 = 370. Since such cases were very rare, the board did not want to change their policy but rather just grant exceptions when the date of moving occurred a few days before the cutoff date.

Peter continued to be active in school business after his term on the board ended. He served as one of three Dresden auditors for two three-year terms and as the sole Hanover District auditor for two one-year terms before that position was eliminated. As auditor, he reviewed the work of a CPA firm. He found it interest-

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NAP Needs Your Input!

Do you have, or know a CAS member who has, an interesting nonactuarial pursuit? If so, we'd like to hear from you. Send an e-mail to ar@casact.org and let us know what you do in your off-hours.

Should We Be Agile?

By Grover Edie, with Brenda L. Kendall, PMP, AIS

Over the years, both as a company employee and a consultant, I have watched company projects fail to deliver. Often the customer got exactly what was specified, but not what was needed.

Scope creep, distractions, specification changes, and a host of other diversions make the deliverable late, over budget, and not "just what the customer wanted"—even though it might be exactly what the customer ordered!

Our work load does not seem to change. There is never enough time in the day or week to get done what needs to get done. There are many ways to try to organize our projects—the question is: what works best? Is there a method that enables us to better deal with scope creep, changes in priorities, and the other influences that adversely affect the project?

To-do lists work for multiple, small projects, and I use them on a daily basis at work and at home where the projects tend to be short and repetitive. However, at work, one problem with a to-do list is that there are many projects and tasks with varying completion times, complexity, and required levels of concentration (for example, compare taking out the trash to doing your federal income tax return), and the penalty or benefit for the completion or failure to complete each of these projects varies. Some of the penalties increase over time, and some of the benefits disappear if the task is not done by a certain due date. To-do lists work, but they are limited.

The more sophisticated project planning tools, such as MS Project, Gantt Charts, Pert Charts, and so forth, work fine for the large projects, but have too high an overhead for smaller projects. There needs to be something in the middle—say a few hours to a week or two of effort.

In the IT world, the traditional method of delivering reports follows the "waterfall" method: define the business requirements, design the report, write the code, test the report, deliver it, and get feedback from the customer.

For over a year, I have been involved with the data warehouse unit (within IT) of Michigan Millers Mutual (MMMIC), who has been using an Agile method called Scrum. Different from the waterfall method, this process was working so well that we adopted it in our actuarial activities. We found it works just as well for those sorts of activities as it had for IT report generation.

Brenda Kendall is the Scrum master for the Pricing team. I asked her to help me write this column. You can find a lot about this online, so we'll keep the descriptions short and tell you how we are using it. (See box on page 17.)

There are many ways to be Agile, and Scrum is just one of them. Agile is an interactive and incremental development framework where requirements, planning, development, and delivery are done in a time-boxed approach by self-organizing and cross-functional teams. Scrum is an Agile method of managing projects or business requests assigned to a team. At the core, Scrum allows the team to focus on delivering the highest business value in the shortest amount of time. Teams are self-organized, which allows them to determine the best way to deliver the business requests. In order for Scrum to be successful, it must be embraced by leadership and be at the core of the company culture.

Once a business request comes into the team, a user story is created in their product backlog by the product owner. The product backlog is essentially an organized list of requests that have come into the team. Each story is business-weighted, or prioritized, by the product owner along with any other customer. In our case, the business weights are assigned by the customers in a group meeting. The heads of commercial lines, personal lines, and marketing all sit together and agree on the importance of each item. Once the stories are weighted and ordered as such in the product backlog, the team estimates the size and effort of each user story. This initial estimate is truly a high-level approximation and is done during an estimating meeting with all customers participating to answer any questions the team has.

Activities are planned in one- to four-week time blocks called "sprints." We use two-week sprints as they allow a quicker inspect and adapt cycle for continuous improvement. During the sprint planning meeting, the team determines what their capacity is for the current sprint and the product owner determines what the sprint goal is, which provides focus for the team. The product owner reviews the product backlog for the highest business-weighted items, and discussions take place between the product owner and team for each item. It is a negotiation of sorts: capacity versus what the product owner wants delivered within the two weeks. Each user story agreed upon is brought into the sprint backlog and broken down further into tasks and finer estimates until the team capacity is full.

Once the sprint officially begins, the team holds a daily Scrum meeting that generally lasts less than 15 minutes. The purpose of this stand-up meeting is team accountability. Each team member answers three questions: What did you do yester-

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day? What are you committing to today? What is in your way?

At the end of each sprint is a review meeting. The purpose of this meeting is to report back to the business areas what was completed during the sprint. While there is a lot of activity and communication with the business area during the sprint, the review meeting allows anyone in the company to see what the team has completed, or not completed, during their sprint. After the review meeting is the team retrospective. The retrospective allows the team, product owner, and business areas to reflect on how the sprint went. This includes looking at areas that need to be improved upon and areas where the team has done something good that needs to continue. The team agrees to which items will be incorporated into the next sprint.

In addition to the team, the key roles we previously mentioned are the product owner and the Scrum master. The product owner is responsible for keeping the product backlog groomed, which includes prioritizing the work. The Scrum master is responsible for making sure the team follows the Scrum practices, assists in removing impediments, and facilitates each of the meetings previously mentioned.

My conclusion is that actuarial activities can benefit from other methods of establishing priorities and managing projects, and Scrum is one of those methods we should explore. I'd appreciate hearing from any of you who are already using this method or other similar methods.

> Visit the following links to learn more:
> Agilemanifesto.org
> Scrumalliance.org
> Mountaingoatsoftware.com
> Scrum.org

Brenda L. Kendall, PMP, AIS, has been a project manager for four years and prior to that was a senior business systems analyst for four years. She has worked in the insurance industry for 17 years. PMP is the Project Management Professional designation by PMI (Project Management Institute). AIS is the Associate in Insurance Services designation by The Institutes (AICPCU).

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ing that government bodies have different accounting principles.

After he left the board, Peter participated in projecting school-age enrollment over a 20-25 year period in preparation for the renovation and expansion of Hanover High School (HHS). He located an expert who recommended basing expected enrollments on projected state population estimates for different age groupings. The committee that he chaired concluded that there would be no substantial increase in future enrollments. The old building housed both the high school and middle school. The district built a new middle school and renovated and expanded the old school to be used as the high school and SAU offices. The building was planned for an enrollment of 850 with construction designed to expand capacity to 950 without much difficulty.

Also after he left the board, an issue re-emerged that was probably the one he felt the most strongly about—whether (HHS) should let in students from other towns. In 1997, while he was on the board, a cap on the number of students was introduced. One of the considerations involved students from outside the district, who paid tuition to attend. If they were excluded, the district would lose revenue. Moreover, some of those families might move to Hanover, increasing the school population without the accompanying tuition revenue. The entire issue was revisited in 2000, after his term on the board ended. In an op-ed piece he argued for a "soft" cap, one that would give the school administration the flexibility to determine the maximum number of high school students. He pointed out the activities and staff that would be cut with the loss of tuition funds. Peter believes his op-ed piece was an important factor in the vote that endorsed the "soft" cap. His preference was actually even more open/liberal, as he would have preferred not closing school doors to students from poorer towns, but, given the political realities, getting a soft cap was probably the best that could be done. With the renovation and expansion of HHS, the issue has gone away as nowadays Hanover's school district seeks tuition students to gain more revenue.

One very recent issue was the disapproval of the teachers' contract last March. Previously, not much attention had been given to the annual increases teachers received under new contracts, as most attention was focused on overall budget and tax increases. Recently, however, because of recent economic difficulties, teachers' salaries have drawn more attention. This led Peter to scrutinize the methodology used in calculating the effect of salary increases and determine that it failed to correctly assess the effect of teachers leaving the system or retiring. Unfortunately, the data underlying his analysis became available too late in the electoral process and, based on incorrect numbers included in different advertisements, the proposed salary increase was defeated.

Whether his proposals failed or succeeded, Peter has found that his actuarial skills have served his community.

Peter Murdza is a consultant for Casualty Study Manuals in Hanover, New Hampshire.

MICHAEL A. WALTERS

How to Reform Health Insurance Using Casualty Principles

Now that the Affordable Care Act of 2010 (ACA) has been found to be constitutional, there may well be a movement after November to repeal it. While the mandate to purchase insurance was ruled unconstitutional under the commerce clause, the law itself is justified as a federal tax. Yet the tax itself and the penalty for not paying it may both be inconsequential, so the number of young uninsureds who will chose to pay overpriced premiums to subsidize the other more generous coverage expansions may be quite small.

Therefore a new system may be needed to accomplish many of the goals of ACA, but without the perceived infirmities of ACA. Such a system could be developed that offers coverage for preexisting conditions, more competition from insurers, and portable policies that can stay with the insured when changing jobs and has guaranteed renewability.

This article will outline a new personal health insurance system (PHIS) that will, at first, seem radical to many because of how the current health insurance system has evolved. Most coverage today is marketed through employers and the price of this coverage for individual policies is heavily influenced by government controls. An example of such a control is community rating to prohibit rating by age, which presumably obligates young people to subsidize the expensive policies of older Americans.

PHIS is modeled after programs that have worked successfully for decades in auto, homeowners, and hurricane insurance, where residual markets have been designed to provide coverage

Reasons for High and Escalating Healthcare Costs

A. Demand is great and growing.

- Everyone wants maximum healthcare—what's more important than your health?
- The population is aging and older people need more healthcare.
- Doctors are motivated to do more, given more techniques available and the threat of lawsuits.
- Increased affluence allows more inclination to spend on the crucial service of healthcare.
- Some lifestyles today are not conducive to good health, e.g., little exercise, obesity, alcohol.
- Knowledge and awareness of insurance programs promote more usage.

B. Supply is not unlimited.

- New technologies are very expensive.
- Training of new doctors is time-consuming and expensive.
- Many uninsureds use emergency rooms in a crisis (more expensive than alternatives, and hospitals' unrecompensed costs are passed along to others in the form of higher prices).
- Medicare's governmental controls on fees discourage new doctors from entering the profession and cause existing ones to consider leaving.

C. Usual price mechanisms to deal with demand/supply issues are not being applied.

- Someone else usually pays the bill—insurance through employers or the government—so customers have little incentive to shop for value.
- It is difficult to change insurers (if employer-supplied) if one is dissatisfied with service.
- Not all expensive procedures are equally valuable; shopping for value is not very common.
- Lack of information on cost and outcomes further limits the ability to comparison shop.
- There is a complex trade-off involving the certain costs of annual checkups and expensive diagnostics versus the cost of treating more advanced problems later.

D. The tort system creates special cost problems.

- Defensive medicine to avoid a tort claim is a wasteful add-on to overall costs.
- Medical malpractice liability insurance (MMLI) for some specialties can far exceed $100,000 a year in premiums, driving up doctor and hospital bills.
- These extra MMLI costs can often deter doctors from practicing in some specialties (e.g. obstetrics) and in some locales.

for hard-to-place risks. The goal is to maintain the competitive market for the 90% or more who have been satisfied with the results of the free market, which has yielded good coverage at relatively low profit margins due to the hundred or so insurance companies licensed to write those coverages in each state.

Yet health insurance does have some additional problems that must be addressed. One such issue is preexisting conditions coverage, which even if priced at an actuarially sound rate, would be unaffordable for many insureds without some premium support—hence, an insurance stamp system could soften the blow for these insureds by providing outright subsidies from Medicaid block grants back to the states. This insurance stamp system would be an improvement over government price controls that attempt to make coverage more affordable, but ultimately could destroy the ability of the competitive market to function.

High Costs—A Major Problem

The reasons why medical costs are so high today and inflating faster than most other goods and services are numerous and complex. The box on page 18 lists some of the underlying reasons flowing from supply, demand, inefficient pricing mechanisms, and the tort system.

The Other Problem—Uninsured Population is Large (But Not Uniform)

There are four broad and very different categories of the uninsured today:

- Higher Cost/Hard to Price—including those with preexisting conditions or other lifestyle problems that could lead to a greater need for treatment in the future
- Rejecting Insurance as Not Worth the Price—including the young who perceive their risk of needing treatment as low, as well as the wealthy who can self-insure and use preventive methods to keep costs down.
- Chronically Ill or Poor—including homeless
- Non-Citizens—in the shadow economy

Even these four broad categories can be broken down further so that the answer can vary greatly from the one-size-fits-all solution adopted by ACA, which said that everybody must buy a government-specified policy.

The **Basic Goals** of PHIS in dealing with the above problems are to (1) contain costs, (2) make healthcare available, and (3) affordable, and to (4) use the free market rather than government controls to keep the system efficient, innovative, well supplied, and competitive.

The **Subsidiary Goals** of PHIS are that healthcare be portable, and guaranteed renewable. Other subsidiary goals are to use incentives rather than mandates to maintain the system and, finally, to acknowledge that insurance is not always the answer to healthcare access.

A better insurance system, based on sound insurance principles along with free market approaches, can help solve a number of the overall cost and availability problems. The solution should avoid the controversial approach of mandating overpriced insurance coverage to some in order to subsidize underpriced coverage for others. It also should not hide the true insurance cost in a "community rating" system that ignores relevant information that can identify where cost controls are the answer rather than just paying total claims.

The PHIS Solution's Nine Basics

1. The Free Market Works—Use It

Sustainable solutions have to abandon the notion of heavy government control that thwarts the efficiency of the competitive market. Front-end government controls lead to an ever-increasing need for even more mandates to keep that inefficient system going.

2. Price Controls Don't Work

Under government price controls (either federal, state, or local), the supply of products and services drops and innovations cease. Government tries to make decisions it is ill-equipped to make, under the mistaken impression that all customers want the lowest possible price, without regard to quality or availability. Mandating a common coverage that government deems to be the desired product usually means many insureds will overpay for some coverages that they don't want or need. The implication would be to let the market offer options.

3. Copy Successes from Other Insurance Programs by State

For risks that are hard to place because of uncertainties and a higher expected loss, but not a catastrophic one, an assigned risk plan works well. Each of these unplaced risks goes into a system that assigns them randomly to voluntary carriers for coverage in each state. The assigned carrier collects the adequate premium for the assessed risk and investigates and pays the claims under the policy.

If the premiums collected are insufficient, an insurer is entitled to pass the loss onto its voluntary insureds in future

Health Insurance Reform, page 20

premiums if it is likely the shortfall will continue. Auto insurance generally works well this way, as a small subsidy is paid by the remaining market. (An underpricing of, say, 20% on 5% of the population that needs an assigned risk plan translates to only about a 1% surcharge on voluntary market rates.)

For catastrophic-type risks (e.g., those with preexisting conditions that make extra high future health costs likely), a separate involuntary market mechanism is needed, similar to a catastrophe wind pool on homeowners insurance.

4. Don't Give Workplace Advantages Over Individual Policies

Employer-based health insurance expanded during World War II, when wage controls spawned tax deductibility to attract workers by this added benefit. Yet the model of working for the same company for one's whole career is now an anachronism and being unemployed for more than a short time is a higher risk that group policies can't handle. Furthermore, health issues may be an impediment to a person even getting a new job if the applicant were viewed as raising the cost of the employer-supplied health plan. Lastly, tax deductibility has caused abandonment of basic insurance principles, like efficient direct payment for the small losses and transferring risk for the large ones.

Individual insurance policies like those in auto and homeowners insurance may be the answer here, especially if they carry guaranteed renewability in the future. If someone develops a subsequent condition after initial underwriting, that can be priced for in the original policy so no extra premium is warranted at renewal. And larger deductibles will bring more control of costs by the insured paying the small bills directly and restoring the buyer/supplier give and take.

5. Combat Overutilization

With more traditional individual policy insurance, higher deductibles, copays, and coinsurance can usually deal better with the problem of overutilization. Costs tend to be higher when the patient is insulated from payment participation decisions and when the costs are paid by somebody else.

6. Use Premium Support, Not Price Controls

Other needs in life do not require federal government intrusions with price controls in the marketplace. Periodic state and local government attempts to provide affordable shelter (e.g., housing projects and rent controls) have usually resulted in failures.

Food stamps, on the other hand, have been a partial aid to affordability without the government trying to control prices. Price controls invariably lead to supply problems (shortages) when competitive markets are short-circuited. Food stamps in theory only go to those who need them without imposing price controls on suppliers.

Health insurance stamps could be used similarly as a partial solution to affordability problems for health insurance without intrusive price controls on healthcare service providers. But, in a lesson from food stamps, effort must be made to eliminate any abuses of the program. The number of recipients of food stamps has doubled in the last 10 years. Government bureaucracy in the program has led to expanded amounts of fraud by those attempting to qualify, with poor incentives to remove the unqualifieds. One answer may be to outsource management of the program to the private sector, possibly varying by state.

7. Avoid New Federal Laws, If Possible

Federal mandates are questionable under the U.S. Constitution. Furthermore, Public Law 15 already exists (passed in 1945 as the McCarran-Ferguson Act) that allows states to regulate the insurance business and preempts most federal action. This law has allowed personal auto insurance and homeowners insurance to flourish with over 100 competitors selling those products in most states, with fairly low profit margins (3% to 4%) typical of highly competitive industries. States also administer the market assistance plans for hard-to-place risks that need these coverages.

One change in federal law is needed, however, to remove the special tax deductibility of group health insurance at work—a deduction that individual policies do not have. This would allow individual policies, with complete portability, to compete with workplace-offered policies.

8. Customize Solutions by Type of Uninsured Today

"One-size-fits-all" solutions mostly don't work. There are many reasons people do not have health insurance today. It is useful to analyze why and craft solutions for each of those major segments, and not to try to solve the whole problem en masse. See the box on page 21 for ways to approach the different types of uninsureds today.

9. Pass Tort Reform by State to Deal With Medical Liability Lawsuits

The fear of lawsuits has spawned the practice of defensive medicine, which is estimated to have increased costs by as much as 10% without really benefiting patients. Spurious lawsuits and outrageous allegations of "pain and suffering" have caused MMLI premiums to exceed $100,000 a year for some specialties. This is ironic because the quality of medicine now is so much

Solutions vary by type of uninsured	
Situation	**Solution**
Between jobs	Portable policies
Long-term unemployed	Medicaid to provide extensive insurance stamps to those with affordability problems
Young and voluntarily uninsured	Low-cost, high-deductible policies
Wealthy and uninsured	Much higher deductibles to incent self insurance but catastrophic coverage policies
Hard-to-price risks	Assigned risk plans at slight surcharge plus insurance stamps for those who need some premium support
Higher risk with higher premiums and lower income	Insurance stamps/premium support for those who need it
Preexisting conditions	Separate policy from specialty insurers; plus insurance stamps/premium support for those who need it
Truly indigent and homeless	Insurance doesn't work as deductibles are no incentive; Medicaid for actual health procedures
Non-citizens, including undocumented workers	Buy their own individual policies; high deductible if cost is a problem; no premium support

better than it was when MMLI coverage was about as cheap as auto collision insurance coverage.

In 1975, California enacted its Medical Injury Compensation Reform Act (MICRA), limiting non-economic loss in medical malpractice cases to $250,000 with caps on attorney fees. This has worked well to bend the cost curve downward. States can be encouraged to innovate with tort reform or to adopt successful models by varying the amount of premium support from the federal government using block grants of Medicaid funds.

Transitioning to PHIS

The alternative health insurance system described herein would take a few years to fully implement, as it depends on the pace at which individual state legislatures take the initiative to foment an aggressive set of assigned risk plans for health insurance. The National Association of Insurance Commissioners (NAIC) and the National Conference of Insurance Legislators (NCOIL) could help with supporting and crafting model legislation, but they would have to wait for the U.S. Congress to take action on the tax deductibility of today's employer-based group insurance policies.

In the atmosphere of lowering overall tax rates by eliminating exemptions and taking tax deductibility away from employer-supplied insurance, PHIS would seem easy to implement. It would then take time for the more than 1,000 insurers in this country to crank up capacity to handle individual health insurance policies and to rate them using new rating criteria allowed by free market principles.

There may be a need for a step-up in actuarial capacity to meet that demand in the U.S. as well. Pricing of individual health insurance policies for over 100 million households has not been needed in the past, as group policies sold through employers have met those needs with relatively few insurers supplying the pricing and using large commercial risk concepts such as experience rating as the pricing mechanism. Having a robust individual risk rating system, such as the model that exists in auto insurance, would be a major expansion of the health insurance pricing challenge, especially when removing the concept of "community rating" where rating variables were not allowed by government fiat. Predictive modeling, a mainstay in the personal auto pricing arena, can be adapted to the huge number of individual health policies unleashed in this new PHIS concept.

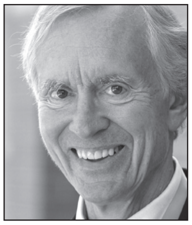
Final Perspective on Costs

In reality, with something as vital as one's health, the proportional cost of healthcare may be appropriate if total health spending stabilizes at 15% or even 20% of GDP. Many would rather have another 20 years of higher quality of life than an 80-inch 3D TV. Most Americans would not trade our medical care facilities for those of other countries where rationing, delays for MRIs, and earlier deaths from preventable outcomes are more accepted.

Health care might well deserve to be the third most costly item in one's annual budget behind shelter and food. The main problem then becomes the need for wider *availability of insurance* to spread out those costs over time, so that one-year variations don't break the bank. And if an alternative healthcare insurance system (namely PHIS) can actually help to bend the cost curve down, even better.

Michael Walters, FCAS, is former CAS president who has written three CAS Proceedings papers on risk classification, homeowners ratemaking, and catastrophe risk that were included on the CAS exam syllabus. He retired as a senior partner of Tillinghast-Towers Perrin (now Towers Watson). Previously he was senior vice president and actuary (in charge of all actuarial and statistical operations) at Insurance Services Office.

President-Elect Nominee



Wayne H. Fisher

FCAS 1976

Retired. Current Director and Audit Committee Chair for the Zurich Holding Company of America

The SOA's decision to launch a general insurance (GI) track presents a challenge to the CAS. To meet this challenge we need to strengthen our working relationships with actuarial organizations internationally. My experience working internationally will help guide us in developing and nurturing these relationships. SOA intends to be an international competitor; we need to be the international collaborator.

Risk management is a growing opportunity. The CERA credential is valuable, but we need to remain thought leaders in the GI components of ERM. My experience as a CERA and former CRO working internationally will be valuable in growing this opportunity for our members.

Board Director Nominees

Charles A. Bryan

FCAS 1974

Board Member of Medical Mutual of Ohio, Safe Auto, Tower Insurance, Munich Re America, Hartford Steam Boiler, and American Modern Insurance Group

Adjunct Professor at Ohio State University (Risk Management and Insurance)

CAB Consulting

I am running because I can contribute substantial value to the Board dialogue and discussion due to 43 years of experience in the actuarial field, my long record of service as an officer and president of both the CAS and the AAA, and my involvement in most aspects of actuarial work. In recent years, I have served on seven corporate boards at various times and I have developed an appreciation for what works well in a governance setting. I advocate an independent CAS offering many high-quality services to our members.

David R. Chernick

FCAS 1984

Consulting Actuary, Milliman, Inc.

As we approach the centennial year of our professional organization, we find ourselves faced with a significant threat to our existence from the SOA. As we approach this threat, I am committed to doing what is necessary for the CAS to continue to be a thriving organization for the next 100 years. I believe my work experience at an insurance company, for a regulator, and currently as a consultant provides a diverse perspective to be a representative of the membership. I greatly appreciate your support in this election.

Ann Conway

FCAS 1988

Director, Towers Watson

The CAS is facing significant challenges: competition from the SOA, a shifting international landscape, and the "encroachment" of other disciplines into our space, to name a few. My CAS volunteer activities have sensitized me to these issues and have familiarized me with the complexities associated with developing approaches to address these concerns as we move forward. While responding to these issues, we also need to ensure that we do not lose sight of the opportunities our collective efforts have created for our membership. If elected, I will work with the Board to be appropriately responsive to these challenges.

MEET THE CANDIDATES

Board Director Nominees

Michael C. Dubin

FCAS 1993

Risk & Regulatory Consulting, LLC

I would always listen to the views of the membership. I believe that the views of our Fellows cannot be discounted because they are the heart and soul of our organization.

The CAS leadership is in danger of losing touch with its membership and needs to make sure it is listening to its members. I would seek your guidance and you would always be able to call me to tell me what you think on any issue important to you. My position is that the membership knows what is best for them to be able to continue to provide unparalleled services.

Richard Fein

FCAS 1978

Principal, RIF Consulting, LLC

For nearly 100 years, we have witnessed the emergence of the FCAS designation as a highly respected and globally recognized asset that each of us enjoys. This asset was built by countless CAS professionals focused solely on property and casualty risks. Our current global standing in this area, as an independent organization, is our signature achievement. I support the proposition that continues our leadership in this field as an independent organization, and oppose dilution or loss of this independence. I will work tirelessly to ensure that the FCAS designation remains relevant, respected, and the gold standard in this field.

Rick Gorvett

FCAS 1996

Director of the Actuarial Science Program, and State Farm Companies Foundation Scholar in Actuarial Science, University of Illinois at Urbana-Champaign

As a professor and director of the largest university actuarial science program in the U.S., and as a former practicing actuary, my primary interests involve the future of the actuarial profession and the CAS. In particular, having educational structures (both basic and continuing) and research opportunities that respond to our evolving actuarial roles—ERM, finance, international—and the changing environment, is critical.

I would welcome the opportunity to contribute, as a Board member, to the future of the actuarial profession and the CAS, and would be honored to take on this important responsibility.

David J. Oakden

FCAS 1979

Managing Director, Actuarial Division, Office of the Superintendent of Financial Institutions, Canada

I am passionate about the actuarial profession and I have devoted a major portion of my working life to CAS and Canadian Institute of Actuaries (CIA) committee work. I have worked in the U.S. and Canada and, in addition, I have had significant involvement in international activities. The CAS and the global insurance industry face a number of significant issues. While I do not have answers to many of these problems, I believe that my background will be of significant benefit to the Board as they deal with these issues.

James (Jim) Rowland

FCAS 1996

Senior Actuary, Allstate Insurance Company

I believe the SOA's entrance into the arena of educating and certifying general insurance actuaries is a tremendous opportunity for the CAS. It is a call to action to leverage existing strengths of the organization, while confronting perceived weaknesses such as complacency and resistance to change. Competition will make the CAS better, and I love competition!

My work experience prior to and during my actuarial career provides me with a unique perspective in areas related to actuarial education and continuing education, which I would hope to leverage as a member of the CAS Board for these "interesting times" we are in.

Traditional Hard Market For P/C Insurers Unlikely Despite Recent Rise In Rates

BOSTON—Although insurance rates have been drifting upward in recent months, the property-casualty industry is unlikely to see a return to the traditional hard market this year or next, a leading insurance expert told a group of reinsurance actuaries at the CAS 2012 Seminar on Reinsurance, held June 4-5.

As part of a wide-ranging talk on the state of the insurance market, Robert Hartwig, president and economist of the Insurance Information Institute, noted that four criteria have to be present for a truly hard market, one in which rates climb sharply—in excess of 10% to 15%.

First, the industry must endure a sustained period of large underwriting losses. Only when underwriting losses are large and sustained do insurers turn disciplined, Mr. Hartwig said.

But this may be beginning, he said. Underwriting losses hit $36.5 billion last year, driven by above average losses from U.S. catastrophes.

In the United States, 2011 saw no Katrina-like megacat, but there was an unusually heavy tornado season. Tornadoes in Joplin, MO, and Tuscaloosa, AL, grabbed the biggest headlines, but there was so much bad weather last year that there was "nowhere to run, nowhere to hide east of the Rockies." Last year was the fifth worst ever for insured catastrophe losses in the United States, adjusted for inflation.

So far this year, catastrophes have been relatively benign.

Second, the industry suffers a material decline in industry surplus or capacity. When surplus falls, rates rise as customers compete for access to the surplus.

But industry surplus remains high, Mr. Hartwig said, hitting a record $565 billion as of first quarter 2011 and falling off only slightly during 2011, despite all the catastrophic losses.

Third, the reinsurance market must be "tight," meaning reinsurance costs are rising and there is a shortage of reinsurance capital. That's somewhat in place, Mr. Hartwig said. Much of the excess capacity in reinsurance at the beginning of 2011 was eaten up by the cost of earthquakes in Japan and New Zealand and floods in Thailand.

Reinsurance rates have risen, especially in markets where the mega-catastrophes occurred. And in the United States, reinsurance prices for catastrophe business are "modestly higher," Mr. Hartwig said, about 8%.

But the current increases pale in comparison to increases seen after other bad years for catastrophe, he observed. After Hurricane Andrew, the 1993 catastrophe market suffered "tremendous dislocation," Mr. Hartwig said, with rates rising 68%. After Hurricane Katrina, rates rose 76%.

Only when underwriting losses are large and sustained do insurers turn disciplined, Mr. Hartwig said.

More importantly, the current environment contradicts "this notion that somehow big catastrophe losses are somehow [by themselves] going to affect prices here," he said. "That notion is incorrect."

Finally, the industry must show renewed underwriting and pricing discipline. There are some signs this is beginning to happen, Mr. Hartwig said. Rates are creeping up in commercial lines, after having fallen steadily for several years.

Commercial insurance rates rose 4.4% in the first quarter, which was the third consecutive quarter of higher rates, according to the Council of Insurance Agents and Brokers. That followed 30 consecutive quarters of declining rates.

Of all lines, workers compensation rates are rising fastest, up 7.4% in the first quarter. But that's in part because results have deteriorated so much in that line. Workers comp combined ratios were 110.6, 116.8, and 115.0 over the past three years, vs. 99.5, 101.0, and 107.5 on commercial lines overall.

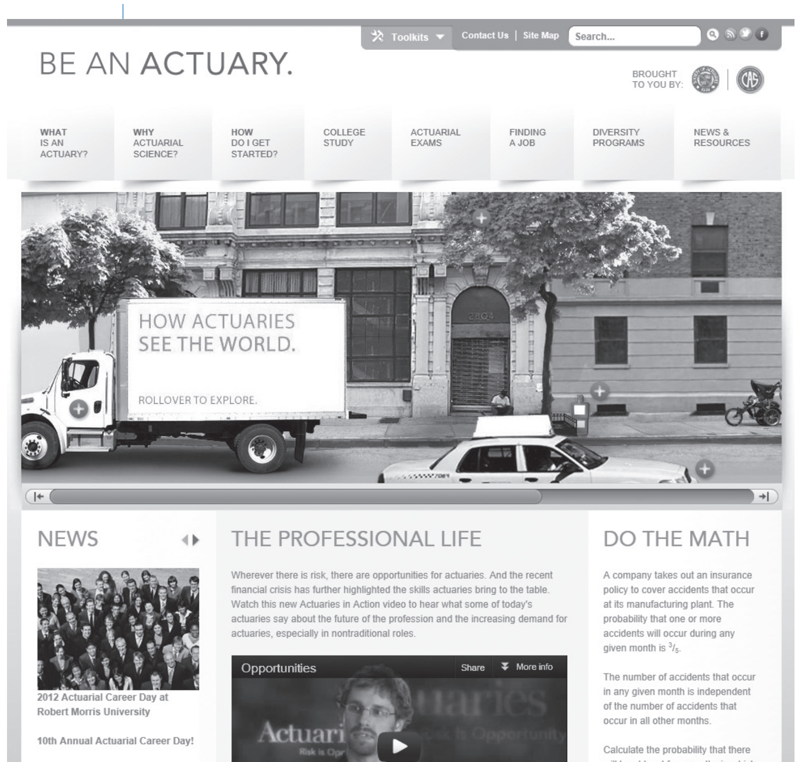
Comp results are as bad as they were a decade ago, Mr. Hartwig said, which was the last time the industry experienced a hard market.

Be An Actuary Web Site Recognized for Excellence

The Be An Actuary Web Site, which is jointly sponsored by the Casualty Actuarial Society and Society of Actuaries, has been recognized by Association Media and Publishing with 2012 EXCEL Awards in three different categories:

- Gold for Web Publishing – Editorial Excellence
- Gold for Web Publishing – General Excellence
- Silver in Web Publishing – Redesign

In addition, Be An Actuary was one of three award winners that received a coveted EXTRA! Award for outstanding innovation in association media and publishing. EXTRA! Awards are given to those entries that push the envelope further in an ever-changing publishing environment.



The Annual EXCEL Awards recognize the best and brightest in association media and publishing. With over 1,000 entries submitted this year, 180 winners, representing 104 non-profit organizations and associations, were chosen for displaying exemplary work in editorial, design, advertising and marketing, online publishing, mobile applications, digital editions, and electronic newsletter categories.

"We are continually impressed with the innovative and creative work that associations submit each year, and the entries we received this year really illustrate the trends prevalent in this industry. The EXCEL Awards honor those who are pioneering ideas in association media, and this year's winners certainly deserve to be recognized," said Amy Lestition, CAE, Association Media & Publishing Executive Director.

Leslie McGee, EXCEL Awards Chair, added, "Associations of all sizes submitted exemplary work, and the judges were challenged to identify only a select few to win the coveted EXCEL Awards. This year's winners are breaking new ground and challenging boundaries with tremendous creativity."

EXCEL Award judges noted that the Be An Actuary Web Site is "clean, concise, and well-branded. The website is very readable and navigable, providing useful, well-written information, such as toolkits, career opportunities, and resources. Impressively employs video content. In addition, the website truly integrates social media, which makes the user's experience highly interactive. The site was welcoming and approachable, effectively targeting and engaging students considering the actuary field. One judge said, 'This is a great site and makes me wish I was in this field!'"

Winners were presented with their awards during the 32nd annual EXCEL Awards Gala on June 11, during the Association Media and Publishing Annual Meeting in Baltimore, MD.

The Be An Actuary Web Site is a collaborative effort between the CAS and SOA. The CAS/SOA Joint Committees on Career Encouragement and Actuarial Diversity view the site as a primary communication vehicle for their work. The site was first launched in October 1999. A redesign effort was undertaken in 2010-2011, with the redesigned Web site unveiled in September 2011.

Visit the Be An Actuary Web Site at www.BeAnActuary.org.

Actuarial Recruiters' Roundtable

By Arthur Schwartz

To assess the state of the employment market for actuaries, I recently held a roundtable discussion with a number of prominent recruiters. Our panel includes:

Angie Wachholz is a Manager with **DW Simpson** in Chicago. **DW Simpson** works on an international basis and at all levels of experience, from Actuarial Student to Fellow. Angie can be reached at angie.wachholz@dwsimpson.com.

Pauline Reimer, from **Pryor Associates** in New York. Pauline Reimer, ASA, MAAA, is a Managing Director who has headed the Actuarial & Modeling Placement Division of her firm since 1986, after working as an actuary in insurance and consulting firms. She can be reached at paulinereimer@aol.com.

Sally Ezra, from Ezra Penland Actuarial Recruitment in Chicago. Sally knows and serves the domestic, offshore, and international property and casualty markets, and has developed strong professional relationships and a vast network of clients. She can be reached at sally@ezrapenland.com.

Robyn Taylor is a Vice President with Actuarial Careers, Inc. in White Plains, NY who specializes in placing actuaries at all levels in the property and casualty industry. Robyn has applied her strong organizational and communication skills to work in the full cycle of the recruiting process, including candidate development, industry research, compensation negotiations, and networking. She can be reached at rtaylor@actuarialcareers.com.

We opened the discussion with talk about salaries. I asked what the typical salary ranges would be for (a) students with 1-4 exams; (b) pre-Associates with 5-6 exams; (c) new Associates; (d) new Fellows; and (e) experienced Fellows (about ten or more years beyond Fellowship).

The charts below illustrate the Roundtable participants' responses. The arguments for excluding bonuses from a salary chart are that base salary is more stable, and that bonuses vary significantly from year to year and from person to person. The arguments for including bonuses on a salary chart are to fairly reflect total compensation, and that many actuaries only report one number to recruiters as their total compensation including bonus.

It is suggested to always clarify whether a published salary chart includes or excludes bonuses, because a comparison of two charts compiled on different bases can result in unrealistic expectations on what level of salary is fair.

Schwartz: How active is the job market by exam level or by experience? Which areas (either types of practice, skill sets, backgrounds, or types of employers (e.g., brokers or reinsurance companies) are really "hot" right now? Which areas are really "cold"?

Taylor: The market is very active [for] all types of actuaries. Students are in demand including entry level. Pre-Associates are hot if they have modeling experience. Associates and Fellows are hot. The only types of actuaries who are not in demand are those people with very narrow backgrounds, for example, someone who's only done homeowners pricing for the last 20 years.

Compensation Excluding Bonus**				
	Years of Experience			
Exams	**0-1**	**1-5**	**5-10**	**10+**
1 to 2	$40-$70	$50-$75	*	*
3 to 4	$45-$80	$57-$85	$68-$110	*
Near Associates (5 to 6)	*	$60-$115	$79-$134	*
Associates	*	$76-$140	$88-$158	$90-$300+
New Fellows	*	*	$95-$215	*
Experienced Fellows	*	*	$105-$240	$110-$500+

Compensation Including Bonus**				
	Years of Experience			
Exams	**0-1**	**1-5**	**5-10**	**10+**
1 to 2	$40-$80	$50-$85	*	*
3 to 4	$45-$85	$57-$100	$68-$120	*
Near Associates (5 to 6)	*	$60-$125	$79-$142	*
Associates	*	$76-$150	$90-$200	$90-$400+
New Fellows	*	*	$95-$250	*
Experienced Fellows	*	*	$112-$275	$130-$500+

**Salaries in $1,000 USD.

Experienced Fellows are in demand, especially people who can build businesses and run teams. P&C insurance and consulting are very active; reinsurance is picking up steam.

Wachholz: We've seen considerable pick up in hiring in the last six to 12 months. It's still a competitive market. Clients (employers) have been highly selective. For example, sometimes candidates will be called back to be interviewed two or three times on site. Employers can afford to be choosy since there's a plethora of qualified candidates.

Ezra: The employment market has increased significantly over recent months. Employers had not hired as many entry-level candidates over the past few years, so there's a shortage of candidates with experience in the 1 to 4 exams (and 1 to 4 years of experience) areas. Perhaps in the past, an employer may have two or three openings, while in today's economic times, they'll reduce that down to one opening and will seek one very qualified candidate. We see employers being very particular about whom they choose. This has caused the hiring process to take longer.

Reimer: Modeling—whether predictive, catastrophe, economic capital, or ERM modeling—is very active. Lines that are hot include property and professional lines (D&O, E&O).

Wachholz: If a candidate has Solvency II experience, that's valuable. The implementation date for Solvency II has been pushed back to 2014, and it appears that the Solvency II requirements will be phased in gradually as this is a moving target. If an insurer in the U.S. has a European parent company, that insurer will be required to report in accordance with Solvency II. The requirements mostly affect how liabilities (reserves) are carried on the balance sheet. It's about an insurer being pro-active at identifying, managing, or mitigating risks.

Ezra: The NAIC and rating agencies such as Standard & Poor's are incorporating into their analyses insurance companies' ERM processes that have Solvency II-related aspects to them.

Schwartz: What are the ideal qualifications that companies look for in selecting an entry level candidate (someone who may have a few exams but no work experience)?

Reimer: The qualities that companies seek in entry level candidates include excellent communication skills, strong interpersonal skills, a high GPA, two actuarial exams passed, and either U.S. citizenship or a green card; candidates with backgrounds in Access and Excel, especially with macros, as well as SQL and SAS are ideal. Certification in any of these computer skills enhances their candidacies. (The "Microsoft Certified Application Specialist" exam is an example of this.) Actuaries have consistently been rated a "Top Profession" by *U.S. News & World Report*, and the career seems to become even more popular during recessions.

Ezra: The actuarial profession gets rated highly by various magazines and *Jobs Rated Almanac*, so more people are interested in becoming an actuary than in the past. Those publications don't say much if anything about the actuarial exam process. For most candidates, the exam process is daunting. They need to be aware of the process and how long it takes, in terms of hours to study for one exam, the many years that need to be devoted toward building up a solid educational base, and obtaining one's credentials to practice as an actuary.

Taylor: If a college student can get an internship with an insurance company that's a significant plus. If that internship were to be in an area related to actuarial work, such as data warehousing, insurance, or healthcare, all of that will help.

Wachholz: More universities are offering actuarial science degrees. That can be attractive to employers.

Ezra: Entry-level candidates with any type of modeling experience through internships or through class studies will have an advantage.

Schwartz: Do you see any trends among entry-level candidates from other countries who may want to work in the USA?

Reimer: There's a provision under NAFTA (North American Free Trade Agreement) whereby someone from Canada or Mexico can get a special "TN visa" that allows them to work in a business in the United States for up to three years. These TN visas are more popular with insurers than the H1B visas.

Wachholz: Companies can sponsor someone for an H1B visa. Often the candidate will say "I'll pay for it," because it costs about $5,000, however legally the candidate cannot pay; instead the onus is on the employer. The company typically has to hire an immigration attorney (if they do not have in-house attorneys) to handle the paperwork, so there's an additional cost. As there are plenty of qualified candidates without visa issues, that's why we see fewer situations where this happens in today's job market.

Reimer: An H1B visa can possibly be converted into a green card. Interestingly, we see the pension consulting firms as being the most willing to sponsor someone through the H1B visa process.

Schwartz: What trends are there in the job market for Associates or Fellows? Specifically, are there fewer openings with more candidates per opening or are these credentialed actuaries more likely to remain where they are than to see other and presumably better opportunities elsewhere?

Ezra: There are two interesting factors at play that have made candidates more open to considering opportunities elsewhere. For one, there are more job openings recently, so actuaries are becoming more open to considering new roles. Also, whereas in the past few years, candidates have been

Actuarial Recruiters' Roundtable, page 28

reluctant if they were underwater on their homes. We see people being more flexible with regard to their home. They are more willing to rent it or even take a loss if the opportunity is attractive and the compensation package that's offered makes up for the loss they may take on their home.

Taylor: Candidates are more positive currently. They're often looking for new opportunities, to get more management experience, or to try something new. Although we don't see as many employers offering relocation packages as formerly, people are more creative in considering options such as renting out their home.

Wachholz: Modeling and analytics are hot areas as we are seeing the use of analytics in all industries. Analytics can broadly be defined as using predictive modeling, tools, and statistics to solve problems within business and industry. On the other hand, the life and annuities area has slowed due to the exposure to capital markets that life and annuity carriers have. We expect there to be more demand in this area in the coming months given there has been a slowdown in recent hiring on this area.

Reimer: The SOA's recent announcement of adding an exam track in general insurance (covering property/casualty insurance) has generated quite a bit of buzz. There are pension, life, and health actuaries who want to switch into property/casualty work, which is perceived as being more creative, diversified, and requiring more professional judgment. Regarding the demand for senior actuaries, consultants who are deemed "rainmakers" are always in high demand. If they leave one consulting practice to work at a competitor consulting firm, they may bring with them numerous clients (assuming this does not conflict with their non-compete agreement) or simply having a track record of new business development success is enough to enhance their marketability to a competitor.

Taylor: For the elite insurance roles, in senior management, we often see the most candidates for the fewest openings.

Ezra: Candidates for senior-level openings find the competition can be fierce. Employers are looking for strong technical skills and modeling experience; someone who's able to dig into the models, and be hands-on, even at the more senior levels.

Reimer: Even at the manager level, companies seek actuaries who are hands on, meaning they have strong technical skills in addition to strong interpersonal skills.

Wachholz: Right. Not just someone who's familiar with models but someone who can pitch in and work side by side with their staff to develop and improve the models.

Ezra: Companies look to hire someone who has good communication skills and good business acumen.

Schwartz: How has the recession affected actuaries' retirement plans? Is there a trend of delaying retirement? Also, how has the recession affected employers' hiring? For example, have employers been more cautious hiring? Have certain types of employers been hiring robustly?

Reimer: Some actuaries like to joke about how the current economy has turned their 401(k) into a 201(k). Also, recently, there are fewer U.S.-based start-up companies compared to pre-recessionary times.

Wachholz: Baby Boomers seem to like working a few more years. Is it in their blood? Maybe. Some actuaries see their pension at risk, and they expect to live longer, so they seem to prefer working longer, too. Another trend we see is for actuaries with small consulting practices to work longer or sell out to a larger consulting organization.

Schwartz: If you are thinking of leaving a current job, how is it best to handle the tricky issue of obtaining a current reference from the people (or supervisor) that you currently work with (or work for)? How is it best to ask someone to be a reference for you? What if you have not worked with them or for them in some time? What if they say no?

Taylor: It's unusual for a potential employer to ask for a reference from someone you're currently working for. The best references come from someone who does not work for your current employer like someone who knows your work yet isn't employed there, like a consultant. It's easy to keep up with your professional friends who are actuaries through Web sites like LinkedIn.

Ezra: Another source is to stay in touch with and contact people who have left your employer and who know you and your work.

Reimer: In lieu of a reference at your current employer, you can offer your own performance appraisals at your current company, especially if they are available and reflect positively on your performance.

Wachholz: If a potential employer is really adamant about getting a reference from your current employer (often your current manager), you may be able to finesse this by agreeing to obtain this after they've made the offer. This is an area where recruiters excel and provide "added value". We have the skills to sell this arrangement to the potential employer.

The Latest on ORSA

By Ralph Blanchard

Many jurisdictions throughout the world are trying to define ORSA and the coming requirement for all insurers to have an ORSA. But what is ORSA, besides an acronym for "Own Risk & Solvency Assessment"? Where did it come from, and where is it heading? The following tries to briefly answer these questions.

What is ORSA—30-second version

The coming ORSA rules are a requirement for insurers to:

- Have in place a method (process?) for assessing their own current and future risk.[1]
- Have some quantification of their own view of needed capital/surplus/equity.
- Report on such on a regular (annual?) basis if requested by their regulator/supervisor.
- Document their own risk and solvency assessment (and potentially share this documentation—or an abbreviated version—with their regulator/supervisor).

The details and extent of these requirements will vary by jurisdiction, and are generally still in the development phase. As of the publication date, ORSA is still largely an untested and somewhat undefined concept in the major jurisdictions of the world.[2]

The origins of ORSA

If ORSA is still somewhat undefined, where did it come from?

The term originated with the U.K. insurance regulator, the Financial Services Authority (FSA). Starting in 2005, under what was known as the Individual Capital Adequacy Standards Regime or ICAS, the FSA required insurers to evaluate their own risks and report the capital the insurer believed it needed to support those risks. The FSA discovered, however, that companies generally treated the ICAS as more of a compliance exercise than an integral part of the insurer's risk management. Those that did the work to support ICAS weren't necessarily tied in to the business operations. The FSA wanted to have the internal capital assessment process "owned" by the insurer (including the insurer's board of directors) and integrated into the operations of the business.

Individual(s) within the FSA developed the concept of an Own Risk and Capital Assessment, based on the ICAS concept, and pushed for its acceptance within new Solvency II requirements. The European Commission endorsed the concept, but made a request that the 'C' (Capital) be changed to 'S' (for Solvency) to make it consistent with what they were generally calling their reforms: Solvency II. As a result, ORCA was changed to ORSA. The concept was also added to the International Association of Insurance Supervisors' (IAIS) list of Insurance Core Principles, or ICPs. (It is currently included in the latest version of ICP 16, dealing with ERM requirements, adopted in October 2010.) This inclusion within the ICPs greatly expanded the geographic reach of the ORSA concept, as the ICPs are essentially the measuring stick used to accredit a country's insurance regulation system.[3] As such, ORSA is now a worldwide requirement.

ORSA versus ICAS

But what is ORSA exactly, and how does it differ from its ICAS predecessor? These are both good questions, but they don't have a full answer yet. Even though the ORSA requirement was added to the ICPs in 2010, neither the U.S. nor Europe has implemented it as of this article's publication date. Both groups are still trying to develop the details. Implementation is still a year or two away in those jurisdictions, although other countries may have implemented some version of an ORSA by now.

In theory, the principle difference between ORSA and the ICAS predecessor is a requirement for the ORSA results to actually be used in running the insurer. This is evident in the language of ICP 16.11.1 where it says *"Every insurer should undertake its own risk and solvency assessment (ORSA) and document the rationale, calculations and* ***action plans*** *arising from this assessment* [emphasis added]*."*

ICP 16 also includes the following additional requirements for the ORSA over those required by the ICAS system:

- The insurer's "board and senior management" are responsible for the ORSA.
- The risks being evaluated must include "underwriting, credit, market, operational and liquidity risks and additional risks arising due to membership of a group."

ORSA, page 30

[1] This requirement may also be established by corporate governance requirements for an ERM process, which would then be leveraged by ORSA requirements.

[2] The U.S., the U.K., and other jurisdictions, however, may already have explicit or implicit requirements for some form of ERM that may accomplish the same thing.

[3] The U.S. insurance regulatory system was last reviewed for compliance with these ICPs in 2009, prior to the addition of the ORSA requirement. The next review of the U.S. system is scheduled for 2014. All members of the G-20 group of countries are required to have a similar review performed every five years, with the review carried out by the International Monetary Fund (IMF).

ORSA, From page 29

- The evaluation includes both current and future solvency/capital needs.

Key points here are the requirement for the ORSA to lead to actual company action plans, a prospective look at solvency, and the requirement for the ORSA to include analysis of group-wide risks. The requirement for a group-wide assessment of risk addresses concerns arising from AIG's difficulties and resulting bailout during the 2008 financial crisis.[4]

One last point here: the ICAS system required insurers to calculate their capital requirement for a 1 in 200 probability of ruin (99.5% VaR) over a one-year time horizon. This was meant to reflect the risk associated with a BBB credit rating. In contrast, the ORSA requirement does not mandate the risk metric to be used (although the Solvency II version does try to tie ORSA into the same 99.5% one year VaR— see below).

U.S. versus European Definitions

Even though all countries need to require an ORSA in order to comply with the IAIS Insurance Core Principles, the resulting definitions and requirements may differ greatly by country. In short, one country's ORSA may be materially different from another country's ORSA.

U.S. Version

The U.S. attempts to define ORSA began in earnest in the summer of 2011. A draft guidance manual that was very prescriptive was exposed for comment early in the summer. Subsequent discussions led to a resulting ORSA manual that is much more principle-based. "Sample" reports in the initial draft were jettisoned due to the risk that they might become de facto industry standards. The final result was guidelines for an ORSA process, along with an annual ORSA "high-level summary report" to be filed on request, although efforts are underway to make this annual filing mandatory for the larger insurers and groups. (In order to keep it a high-level summary, the report may reference supporting documents rather than containing all otherwise-required details in the filed report.) The underlying model law that would implement this requirement is currently under development at the NAIC.

A major part of the U.S. initiative is the focus on a group ORSA, i.e., an ORSA for the entire group and not just the individual legal entities under the group. This at least partially addresses the biggest issue that arose the last time[5] the U.S. insurance regulatory system underwent a review against the IAIS Insurance Core Principles, namely a lack of sufficient regulatory controls with regard to insurance groups.[6] (Note, however, that the overall result of the FSAP review was positive, as witnessed by the lead sentence in the report's Main Findings: "Insurance regulation in the United States is generally thorough and effective, although there are areas where development is needed.")

On the documentation front, the U.S. approach is to require a company to *"internally document the ORSA results to facilitate a more in-depth review by the regulator through analysis and examination processes."* This review could then lead to the state regulator *"requesting additional information … through the state's analysis or examination processes."* In other words, the intent seems to be to tie this to the regular financial examination process, hence relying at least partially on an audit trail rather than exclusively on a pre-existing documentation library.

The U.S. regulators are also performing a test of the ORSA concept, through a request for voluntary submissions of sample ORSA reports in the summer of 2012.

Europe's Solvency II version

The definition of ORSA is not as far along under Solvency II. Draft guidance was exposed via a Consultation Paper in November 2011 with a comment deadline two months later. A revised draft reflecting those comments had yet to be published as of May 29, 2012.

Principal differences from the U.S. approach at this point seem to be:

- The use of ORSA as a test of the Solvency Capital Requirements (or SCR, the European version of RBC, set at a 1-in-200 year probability of ruin over a one-year time horizon). In fact, the draft guidelines require an insurer to test the assumptions in the SCR against its own view of risk, and to quantify any material differences.
- The requirement for a more fully completed documentation package on hand. This is consistent with the overall trend within Solvency II for extensive (some would say "excessive") documentation.
- Explicit requirements to include many internal controls

[4] Note that AIG was not the only financial conglomerate with significant insurance operations that needed a bailout during the crisis. The Netherlands-based giant ING received a government bailout of €10 billion in 2008.

[5] This occurred in 2009. The individual in charge of the review on behalf of the IMF was Tom Karp, an Australian who had previously worked for the Australian financial services regulator APRA.

[6] The exact words used in the FSAP were: "The approach to supervision of groups needs significant development." Financial Sector Assessment Program, United States Of America
IAIS Insurance Core Principles, Report On Standards and Codes (ROSC) July 2010, page 7, found on the 53rd page of the pdf file at http://www.imf.org/external/pubs/ft/scr/2010/cr10250.pdf

in the ORSA, including compliance with reserve setting requirements and the reflection of the risk assessment when designing new insurance products.[7]

Overall, the Solvency II requirements for ORSA will probably be more prescriptive than in the U.S., as witnessed by 30 pages of draft guidance in the November 2011 exposure draft, compared with only 8 pages of draft guidance in the final NAIC ORSA guidance manual.

Lloyd's of London

Lloyd's has already instituted an ORSA requirement for its members, effective with the December 2011 submission, despite the lack of a final Solvency II standard. This is an internal standard which anticipates features of the final regulatory standard, and hence is subject to change as the Solvency II regulations are finalized. (Note that Lloyd's did not expect the December 2011 version of the ORSA report to be fully complete. Instead they saw it as a test of each syndicate's level of preparedness with regard to ORSA requirements, in preparation for Lloyd's 2012 submission to its regulator, the FSA.)

The Lloyd's structure also results in a relatively unique situation vis-à-vis ORSA regulatory requirements. For solvency regulation purposes, all of the Lloyd's syndicates combine into a single regulatory unit, with the whole of Lloyd's acting as a guarantee fund with regard to each syndicate's liabilities. Hence, Lloyd's has to produce an aggregate ORSA report to its regulator (the FSA) that combines in some form the results of all the individual ORSA processes and reports of each of its syndicates. As a further complication, each syndicate is still allowed to adapt its ORSA to its own unique risks and following its own timetable, as long as they produce an overall assessment and report to the Lloyd's leadership at least annually.

Other Jurisdictions

Canada—The insurance regulator in this country (OSFI) has announced that it will be issuing ORSA guidance later this year.

Australia—This country's insurance regulator (APRA) will require insurers to have in place by the beginning of 2013 an ICAAP (Internal Capital Adequacy Assessment Process), which is meant to be equivalent to Solvency II's ORSA (although it is unclear to the author how this can be evaluated, given that Solvency II's version of ORSA has not yet been finalized).

What may be lost in all this discussion is that ORSA is just a part of ERM, and ERM should already be practiced by insurers today. Hence, none of this is totally new; it is just a formalization or codification of what companies should be doing in some form today. Whether or not the additional specifications and requirements add or detract from the overall ERM process remains to be seen, with the result probably varying significantly by jurisdiction.

Thanks to Rob Curtis, currently with KPMG and formerly of the U.K. FSA, for background on ICAS history. Thanks also to Kris DeFrain and Kathryn Morgan for their contributions and edits to this article, and to Chris Townsend and Rade Musulin for the Canadian and Australian insights, respectively. AR

[7] Guidelines 12 and 14 as found in the Consultation Paper.

Recommended Readings and References

Individual Capital Adequacy Standards (ICAS)

Huerta, Thomas F., "Modernisation of the regulatory regime in general insurance: How far have we come? An FSA Perspective," Speech before the FSA Insurance Conference, http://goo.gl/fW7Gw.

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Enterprise Risk Management, International Association of Insurance Supervisors, Insurance Core Principles (ICP) material adopted October 2010 (to be included in full set of ICPs to be adopted in 2011, http://goo.gl/SL4QW.

ING Bailout

Yousfi, Jennifer, "ING Gets a $13.4 Billion Government Boost," *Money Morning*, http://goo.gl/P3xCb.

"ING To Sell US Online Bank To Capital One For $9B In Order To Repay Bailout," Reuters, http://goo.gl/9LJjR.

2009 FSAP and Tom Karp Role

International Monetary Fund, "United States: Publication of Financial Sector Assessment Program Documentation—Reports on Observance and Codes," July 12, 2010, http://goo.gl/fW7Gw.

NAIC Own Risk and Solvency Assessment (ORSA) Guidance Manual – 2011

http://www.naic.org/documents/committees_ex_isftf_group_solvncy_exposure_draft_orsa_guidance.pdf

Solvency II ORSA Guidance

https://eiopa.europa.eu/en/consultations/consultation-papers/2011-closed-consultations/november-2011/solvency-ii-consultation-paper-on-the-proposal-for-guidelines-on-own-risk-and-solvency-assessment/index.html

Lloyds of London

"Solvency II—Own Risk and Solvency Assessment (ORSA) - Guidance Notes," September 2011, http://goo.gl/hBTfb.

New Fellows Admitted Spring 2012

Row 1, (left to right): *Heidi Sullivan (FCAS November 2011), Eunice K.Y. Loi, Emilie Rovito Dubois, Denise Susan Di Renzo,* ***CAS President Patricial Teufel,*** *Etienne Collard-Proulx, Alissa Joy Bowen, Yun Li, Alena Kharkavets.*

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Row 3, (left to right): *Katherine Stelzner, Shane Eric Barnes, Scott G. Burke (FCAS November 2011), Brett D. Jaros, Brian C. Alvin, Emily A. Lyons, Devyn K. Clifford, Molly Catherine Ingoldsby, Xianfang Liu, Sebastien Bernard.*

Row 1, (left to right): *Kirsten M. Singer, Kelly Aline Sullivan, Tracey Ellen Steger, Annie On Yee Wong, Julia Methling Ryan,* ***CAS President Patricial Teufel,*** *Tracy Leslie Valentine, Julieta A. Zambrano, Joanne Yammine, Lydia Roy, Brian M. Ironside.*

Row 2, (left to right): *Kaushika Sengupta, Jared Wallace Steinke, David R. Iverson, Xiaoyun Ling, Nadia Pelletier, Ghislain Brault-Joubert, Sergei A. Panafidin, Laura Lucy Sutter (FCAS November 2011), Mark B. East, Pierre Parenteau (FCAS November 2011), Steven P. Lafser.*

Row 3, (left to right): *Michael Thomas Villano, Lijia Tian, Benjamin Carl Ferguson, Katherine Ann Eenigenburg, Adam B. Tyner, Bo Yan, David Itzkowitz, Michael Epstein, Xuan Li, Cui Liu (Karen) Cai (FCAS November 2011).*

New Fellows not pictured: *Fiona E. Ha, Ashish Rasik Hingrajia, Yehuda S. Isenberg, Paul E. Kutter, Pin Chin Lung, Sikander Shiraz Nazerali, Ping Su, Hao Wang, Zheng Yu Wang, Nan Zhang.*

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Outreach to Expat CAS Members

By Gabriel Ware, Co-Chairperson, CAS International Member Services Committee

How do I find an apartment in Sydney? How do I purchase health insurance in Germany? Is it possible to meet up with someone in Beijing who speaks English? How can I better understand my new Brazilian colleagues? Are there any professional gatherings of actuaries in Dublin?

Few experiences are as exciting and bewildering as those encountered by expats assimilating into life outside of their native countries. They must figure out how to operate in foreign cultures, legal systems, business environments, and societies. They might need to figure all of this out in an unfamiliar language.

Whether you are on a temporary assignment within your company or have permanently relocated, a friendly and knowledgeable contact who can provide insights to help navigate life's new complexities is an invaluable resource. The International Member Services Committee (IMSC), a volunteer committee within the CAS focused on connecting and supporting CAS members living outside of North America, has recently started an outreach program focused on providing just this kind of support.

Through our regional contacts currently located in the U.K. and Europe, Hong Kong, Australia, India, and Brazil, we provide local contacts to newly relocated CAS members. The table at right shows the number of relocated CAS members we have connected with since the inception of our outreach program in 2011.

Region	Total
United Kingdom	18
Switzerland	8
Other Europe	11
China	9
Hong Kong	6
Other Asia	10
Australia	3
Africa/Middle East	3
Grand Total	**68**

In addition to facilitating the relocation of CAS members, these connections have strengthened the international community of the CAS and have helped to expand the international CAS influence.

Have you recently moved abroad? Are you considering a relocation outside of North America and curious about the culture? Are you interested in networking with CAS members in your international city? Would you like to serve as a contact for CAS members moving to your region? If you answered yes to any of these questions, we want to hear from you! Please send an e-mail to me at gabriel.ware@agcs.allianz.com.

Deadline for ICA 2014 Papers and Presentations is September 30

ICA 2014 CIA
WASHINGTON DC

The ICA 2014 Scientific Committee has issued the Call for Papers and Presentations for the 2014 Congress. Actuaries and non-actuaries interested in presenting a paper or making a presentation are invited to submit an abstract of their proposed paper/presentation to the Scientific Committee by the deadline of **30 September 2012.**

View the complete Call for Papers and Presentations on the ICA 2014 Web Site at www.ICA2014.org for proposal submission procedures and requirements. Please contact David Core (dcore@casact.org), ICA 2014 Secretariat, with any questions.

ICA 2014: A Team Effort

By S. Michael McLaughlin, Chairperson, ICA 2014 Sponsorship Committee

In 1912, the Japanese government, in a gesture of friendship, donated 3,000 cherry trees to the United States. Every year, the beautiful pink flowers burst into bloom, announcing the beginning of spring. Before you know it, the cherry blossoms of spring 2014 will be here. So mark your calendars for 30 March through 4 April 2014—the perfect time to enjoy the spectacular cherry blossom display—and join more than 2,000 actuaries and their guests, who will descend on Washington, D.C. for the 30th International Congress of Actuaries (ICA).

The ICA is held every four years, and in 2014 it will be hosted by the five U.S. actuarial organizations. The previous Congress was held in 2010 in Cape Town, South Africa, and was a resounding success. More than 85% of attendees rated it highly, with value placed on both the scientific content and the social and networking opportunities. Based on personal experience, anecdotes, and surveys, the Congress is among the most valuable of all actuarial meetings that attendees have experienced. We expect ICA 2014 will maintain the tradition of excellence.

The technical content will follow the main tracks of the actuarial discipline, namely life, health, pension, general insurance, risk management, consulting, and professionalism. The scientific content is projected to be technically strong. Many sessions will consist of presentations by authors on papers submitted specifically to the Congress. Papers are refereed to ensure high quality. Some of the most eminent actuaries in the world will give presentations, and discussions will be particularly valuable because of the wide-ranging insights from actuaries in different countries. The ICA 2014 call for papers is open through 30 September 2012. See the ICA 2014 Web Site at http://www.ica2014.org/ for details.

Behind the scenes, a small army of volunteers and staff is already busy planning the event. At least eight committees are hard at work, focusing on the scientific program, hospitality, logistics, sponsorships, marketing, special events, finance and risk management.

Of course, it also takes some funding to pull this off! The Marriott Wardman Park promises to be an excellent venue, but they do need to be paid! The cost of dinners, receptions, lunches and breaks adds up fast, not to mention planning costs, meeting space, and equipment rental. Delegate and guest registration fees cover approximately 65% of total costs. Sponsors and exhibitors are needed to make up the rest. The Sponsorship Committee has already recruited a number of sponsors but needs more support.

We are delighted that Swiss Re, D.W. Simpson, Milliman, Towers Watson, and RGA are supporting ICA 2014 as Platinum sponsors. Sponsorship benefits include complimentary registrations, exhibit space, broad exposure and unparalleled recognition. See the box below for more reasons that your firm should consider ICA 2014 sponsorship opportunities.

Your hosts—the American Academy of Actuaries, American Society of Pension Professionals and Actuaries, Casualty Actuarial Society, Conference of Consulting Actuaries, and Society of Actuaries—invite you to attend the 30th International Congress of Actuaries. Again, please visit the ICA 2014 Web Site at www.ica2014.org for much more information.

ICA 2014 Sponsorship Opportunities

ICA 2014 offers four sponsorship packages—Platinum, Gold, Silver, and Bronze—to accommodate a variety of marketing budgets. Each sponsorship level will accept a limited number of sponsors, with the Platinum level already sold out. Sponsors receive benefits commensurate with their investment.

Why Sponsor at ICA 2014?

- A sponsorship is a unique opportunity available to a limited number of companies that will enhance their stature through visibility and exposure at the Congress.
- Build and reinforce name recognition for your company and your products among 1,500 to 2,000 delegates from all actuarial disciplines and from around the world, as well as with visitors to the ICA 2014 Web Site before, during, and after the Congress.
- Demonstrate your support for the actuarial community and a commitment to education.
- Meet with your prospective customers and clients at your exhibit booth. Many of the delegates hold high-level management positions in their companies and are a major buying influence, and ICA 2014 sponsors can participate in ICA 2014 exhibit hall as part of their sponsorship package.

For more information, download the sponsorship prospectus at www.ICA2014.org/sponsors or contact Mike McLaughlin at smichaelmclaughlin@gmail.com to discuss sponsorship opportunities.

GLENN MEYERS

Pumping Up the Variance in Loss Reserve Models

As readers of this column may recall, last year Peng Shi and I set up the CAS Loss Reserve Database for the purpose of retrospectively testing stochastic loss reserve models. In some initial tests we, and others, are finding that many of the traditional loss reserve models predict ranges that are too narrow.[1] This could mean that either: (1) the claims environment is dynamic and changes in ways that cannot be gleaned from the data, or (2) we need to improve the model. In spite of the multitude of models that are out there, I have been focusing on finding an improved model. In this column I will describe a strategy that should lead to better models and illustrate one example that is a step in implementing this strategy.

The testing of currently popular models has pointed where we need to go. We need models that allow for greater predictive variability. What follows is one attempt to pump up the variance of the popular Mack chain ladder model.

First, let's describe the chain ladder model. Following Mack, let $C_{w,d}$ denote the accumulated claims amount, either paid or incurred, for accident year, w, and development period, d, for $1 \leq w \leq K$ and $1 \leq d \leq K$. $C_{w,d}$ is known for $w + d \leq K + 1$. The goal of the chain ladder model is to estimate $C_{w,K}$ for $w = 2,\ldots, K$. The chain ladder estimate of $C_{w,K}$ is given by

$$C_{w,K} = C_{w,K+1-w} \cdot f_{K+1-w} \cdot \ldots \cdot f_{K-1}. \qquad (1)$$

where the parameters $\{f_d\}$, generally called the age to age factors, are given by:

$$f_d = \sum_{w=1}^{K-d} C_{w,d+1} \Big/ \sum_{w=1}^{K-d} C_{w,d}$$

It will be helpful to view the chain ladder model in a regression context. In this view, the chain ladder model links $K-1$ weighted least-squares regressions through the origin with dependent variables $\{C_{w,d}+1\}$, independent variables $\{C_{w,d}\}$, and parameters f_d for $w=1,\ldots, K-1$. Since each parameter f_d is an estimate, it is possible to calculate the standard error of the estimate, and the standard error of various quantities that depend upon the set $\{f_d\}$. Mack derives formulas for the standard error of each $C_{w,K}$ given by Equation (1) and of the sum of the $C_{w,K}$s for $w = 2,\ldots,K$.

Given a cumulative claims triangle $\{C_{w,d}\}$, the R "ChainLadder" package calculates the chain ladder estimates for each $C_{w,K}$ and the standard errors for each estimate of each $C_{w,K}$ and the sum of all the $C_{w,K}$s.

Now let's consider an alternative regression-type formulation of the chain ladder model. This formulation treats each accident year, w, and each development year, d, as independent variables. The model works in logarithmic space, and so the dependent variable will be the logarithm of the total cumulative (paid or incurred) claim amount for each w and d. The model takes the following form.

$$C_{w,d} \sim \text{lognormal}(\alpha_w + \beta_d, \sigma_d) \qquad (2)$$

i.e., the mean of the logs of each claim amount is given by $\alpha_w + \beta_d$ and the standard deviation of the log of each claim amount claim amount is given by σ_d.

Let's call the parameters $\{\alpha_w\}$ the level parameters and the parameters $\{\beta_d\}$ the development parameters. Also set $\beta_1 = 0$. As more claims are settled with increasing d, let's assume that σ_d decreases as d increases.

If we assume that the claim amounts have a lognormal distribution, we can see that this new model is a generalization of the chain ladder model in the sense that one can take the quantities on the right-hand side of Equation 1 and algebraically translate them into the parameters in Equation 2 to get exactly the same estimate. One way to do this is to set:

$$\beta_d = \sum_{i=1}^{d-1} \log(f_i) \text{ for } d = 2, \ldots, K, \ \alpha_w = \log(C_{w,K+1-w}) - \sum_{i=1}^{K-w} \log(f_i)$$
and $\sigma_d = 0$.

Note that the chain ladder model treats the claims amounts $\{C_{w,K+1-w}\}$ as independent variables—that is to say, fixed values. In this model, the role of the claims amounts, $\{C_{w,K+1-w}\}$, is (indirectly) taken by the level parameters, $\{\alpha_w\}$, that are estimates and subject to error. Thus we should expect this model to predict wider ranges. Let's call this model the leveled chain ladder model.

Historically, one problem with introducing a new model is that it could require a significant amount of analytical work to derive the predictive distribution. I am a true admirer of the work that Mack did to derive the standard errors for the chain ladder model. These days, with the availability of high-speed

[1] See, for example, a 2010 CLRS presentation by Jessica Leong. The presentation can be downloaded from http://www.casact.org/education/clrs/2010/handouts/VR6-Leong.pdf.

Table 1

$w \backslash d$	1	2	3	4	5	6	7	8	9	10
1	1,722	3,830	3,603	3,835	3,873	3,895	3,918	3,918	3,917	3,917
2	1,581	2,192	2,528	2,533	2,528	2,530	2,534	2,541	2,538	
3	1,834	3,009	3,488	4,000	4,105	4,087	4,112	4,170		
4	2,305	3,473	3,713	4,018	4,295	4,334	4,343			
5	1,832	2,625	3,086	3,493	3,521	3,563				
6	2,289	3,160	3,154	3,204	3,190					
7	2,881	4,254	4,841	5,176						
8	2,489	2,956	3,382							
9	2,541	3,307								
10	2,203									

Table 2

	Level Chain Ladder			Chain Ladder/Mack			
w	Estimate	Std. Error	CV	Estimate	Std. Error	CV	Actual
1	3,917	72	0.0184	3,917	0	0.0000	3,917
2	2,545	60	0.0236	2,538	0	0.0000	2,532
3	4,113	107	0.0260	4,167	3	0.0007	4,279
4	4,309	123	0.0285	4,367	37	0.0085	4,341
5	3,548	113	0.0318	3,597	34	0.0095	3,587
6	3,316	136	0.0410	3,236	40	0.0124	3,268
7	5,313	270	0.0508	5,358	146	0.0272	5,684
8	3,777	300	0.0794	3,765	225	0.0598	4,128
9	4,203	564	0.1342	4,013	412	0.1027	4,144
10	4,081	1,112	0.2725	3,955	878	0.2220	4,181
Total w=2–10	35,206	1,524	0.0433	34,997	1,057	0.0302	36,144

computing and the Bayesian MCMC methods, such calculations are well on their way to becoming routine. In the 2012 May "Brainstorms'" column, I illustrated the use of an MCMC method to calculate the range of a trend estimate with the R and JAGS computing language.

I have written an R/JAGS program that estimates the predictive distribution for cumulative triangles in the CAS Loss Reserve Database, which is included with the Web version of this article.[2] It uses a uniform prior distribution for all parameters. It works by using the JAGS MCMC simulation to generate 10,000 samples of the $\{\alpha_w\}$, $\{\beta_d\}$ and $\{\sigma_d\}$ parameters. Next it simulates 10,000 claims amounts, one for each set of parameters, from the lognormal distribution in Equation 2 to generate the predictive distribution. Table 1 gives an incurred loss development triangle from an insurer in the CAS Loss Reserve Database. Table 2 gives the output for both this model and the Mack chain ladder model.

As we can see, the leveled chain ladder model does widen the ranges. But as it turns out, it does not widen them enough. In the CAS 2012 Spring Meeting session "Reserve Risk Models: White, Grey, and Black Swans," I presented results based on 50 insurers for four different lines of insurance that showed that the ranges produced by the leveled chain ladder model are still too narrow. We need to pump up the variance even more.

So where does that leave us? First, we have a lot of data available for testing in the CAS Loss Reserve Database. Second, we have the Bayesian MCMC methodology that enables us to quickly estimate the ranges implied by the data and the model. All we need to do is to find a better model. Stay tuned.

[2] See the May 2012 *AR* "Brainstorms" column for guidance on running R/JAGS code.

2012 CAS Annual Meeting Heads to Walt Disney World

The CAS Annual Meeting is an opportunity for actuaries and other insurance professionals to stay abreast of current issues affecting the actuarial profession, and to interact with other actuaries from around the globe. A panel of CROs will lead the CAS Annual Meeting, which is scheduled for November 11-14, 2012, at the Walt Disney World Swan Hotel in Lake Buena Vista, FL. In addition, general sessions will address ORSA, Cat Modeling, and the Reserving Initiative of the U.K. Actuarial Profession. The CAS Annual Meeting will offer over 25 concurrent sessions and interactive roundtable discussions, providing many opportunities for attendees to earn continuing education credits.

Complementing the educational program are ample networking opportunities. Attendees will enjoy dinner Tuesday evening at the EPCOT® World ShowPlace. After dinner, attendees can sample platters of delicious desserts and coffees, all of which is a prelude to the evening's grand finale, "IllumiNations: Reflections of Earth," Disney's award-winning night time show set against the entire World Showcase Lagoon and the skies above.

The Walt Disney World Swan Resort is an extraordinary backdrop for the Annual Meeting. Guests of the Swan are entitled to many special Disney benefits to help make the most of their visit, such as complimentary scheduled transportation to the Disney theme parks and attractions, on-site Disney ticket and information desks, the Extra Magic Hours benefit in the theme parks, on-site character dining, and advance tee times on championship Disney golf courses.

Details and an online registration form are available on the CAS Web Site at www.casact.org. Register today!

Seminar Focuses on Catastrophe Risks

"A Chief Risk Officers' Forum," "Examining Emerging Risks," and "The Shifting Nature of Catastrophe Risk in the United States" are the three general sessions to be delivered at the 2012 CAS Special Interest Seminar, "In Focus: Taming Cats: Managing Natural and Man-Made Catastrophe Risks." The seminar will take place October 4-5, 2012, at the Baltimore Marriott Waterfront in Baltimore, MD.

Actuaries who manage catastrophe risks, work in reinsurance, or are interested in the latest in catastrophe risk management, and who want to network with peers from around the globe, should attend this seminar.

This seminar will offer over 25 concurrent sessions, many of which will be recorded to allow attendees to take advantage of the full spectrum of learning at this event. Concurrent sessions will include the following topics:

- Earthquakes
- Floods and Flood Plans
- Crop Insurance
- Measuring Cat Exposure in the Energy Space
- Incorporating Cat Model Data into Economic Capital Models
- Cat Portfolio Optimization and Capital Allocation
- Managing Cat Risk: It's all About the Portfolio
- The Next Phase of Cat Models and Modeling

Details and an online registration form are available on the CAS Web Site at www.casact.org. Register today!

Join us in Denver for the 2012 CLRS!

Attendees will leave this year's seminar better able to understand, evaluate, and estimate loss reserves.

Earn continuing education (CE) credits and network with other loss reserving professionals at this year's Casualty Loss Reserve Seminar (CLRS), September 5-7, 2012, at the Sheraton Denver Downtown Hotel in Denver.

The CLRS will offer basic and advanced sessions covering a variety of topics and tracks, including reinsurance reserving, financial reporting, variability and ranges, international issues, catastrophes and mass torts, professional development, emerging issues, and other areas specific to individual lines of business.

Highlights include:

- Keynote speaker Kevin Clinton, Michigan's Commissioner of Insurance, discussing "The Complete Spectrum— Consulting Actuary, Company Actuary, CEO and Current Chief Regulator. Perspectives from the Past to the Present and into the Future."
- Over 60 concurrent sessions with tracks including health care, financial reporting, self-insured, and reinsurance.
- Up to 15 CE credits for sessions and extra CE credit by attending a roundtable discussion.
- **An all new** full day of interactive pre-seminar workshops, including a Reserving Bootcamp.
- General session speaker Alison Felix, a Federal Reserve economist, reviewing current macroeconomic statistics with commentary regarding the derivation of these statistics and projections going forward.

The CLRS is an opportunity to present and discuss significant loss reserving issues and their related financial reporting implications. The CAS, the American Academy of Actuaries, and the Conference of Consulting Actuaries have devised this year's program to include a range of topics of interest to professionals and students from a wide array of disciplines, including insurance, accounting, and risk management. Moreover, the seminar meets the continuing education needs of actuaries and other professionals whose responsibilities include loss reserving.

Save $200 on the registration fee by registering before August 7.

Register online at www.casact.org today!

Exhibit at the 2012 CLRS

The CLRS organizers encourage companies to exhibit their products and services to professionals who collect, compile, and analyze data on loss reserving. This seminar will give exhibitors the opportunity to show how their products or services can help solve the loss reserving professional's problems. To learn more about this opportunity, please contact Megan O'Neill at moneill@casact.org.

Actuarial Foundation Update

THE ACTUARIAL FOUNDATION

A Special Thank You to CAS Members

As another school year comes to a close, The Actuarial Foundation extends heartfelt thanks to all of the CAS members whose generosity helped to put our award-winning *Building Your Future* materials into the hands of 8,800 high school teachers nationwide. From managing a checking account to investing risk and diversification, *Building Your Future* challenges teens with real-life scenarios and showcases the impact of financial decisions they make. Your continued support will benefit the more than 200 teachers still on the waiting list to receive a donated classroom set. Thank you for extending educational opportunities to unlock the potential of so many students.

Register for the ERM Online Course!

Professors from the University of Illinois at Urbana-Champaign are conducting this online course to introduce actuaries to enterprise risk management (ERM) and demonstrate how actuarial skills and techniques are incorporated into ERM.

Consisting of 12 lectures, some readings, a discussion forum, and an exam, the course will be delivered via the CAS Web Site. PowerPoint lectures and accompanying audio voiceovers will be provided on CD for all participants. (Participants must have Microsoft Office PowerPoint software in order to participate in the class).

The course will be taught asynchronously so participants can fit the work into their individual schedules.

Course lectures cover the following topics:

1. Introduction to ERM
2. ERM in Context
3. ERM in Practice
4. ERM Framework
5. Hazard Risk
6. Financial Risk
7. Operational Risk
8. Strategic Risk
9. Risk Metrics
10. Application of ERM
11. COSO (Committee of Sponsoring Organizations of the Treadway Commission) Framework—Pros and Cons
12. Conclusion

The course presumes no prior knowledge of ERM. Enrollment is limited to a maximum of 40 participants. Instructors are Stephen P. D'Arcy, FCAS; Richard W. Gorvett, FCAS, ARM, FRM; and Mark Vonnahme.

To ensure all participants receive the course materials in a timely manner, course registration will close on September 12, 2012.

Visit http://www.casact.org/education/oncourses/ for more information and to register.

Going Mobile with the New CAS Web Site

By Mike Boa, Director of Communications and Marketing

Access to Web sites on smartphones, tablets, and other mobile devices is exploding. Consider this:

- As of February 2012, nearly half (46%) of American adults were smartphone owners, an increase of 11 percentage points over the 35% of Americans who owned a smartphone in May 2011 (Pew Internet).
- The number of iPad users in the United States will rise by over 90% in 2012 (eMarketer).
- In the United States, 25% of Web users only use their mobile device to access the Web. (mobithinking.com).
- At the end of 2011, there were 6 billion mobile subscriptions, which is equivalent to 87% of the world population (The International Telecommunication Union).

This trend has not been lost on the CAS, which embraced the growing mobile movement with the release of an app to support the 2012 Spring Meeting. Attendees were invited to download the free app to their mobile device for access to real-time schedule and speaker updates, the most current version of the list of attendees, maps of the meeting space, and more. The app was accessed by 444 unique visitors, so with about 635 registered attendees, the app was utilized by over two-thirds of those attending the meeting.

The CAS is continuing to respond to the rapid growth in accessibility of online content by mobile devices with the launch of the redesigned CAS Web Site. With the launch, a mobile version of the Web site is now available to allow members and candidates easy access to CAS information through their smart phones and tablets.

The need for a mobile Web site was just one requirement that the Committee on Online Services and staff became aware of in its research before beginning the redesign project. A survey of the Member Advisory Panel and interviews with members and candidates were conducted to learn about preferences for CAS online services so that the redesigned Web site was responsive to member and candidate needs.

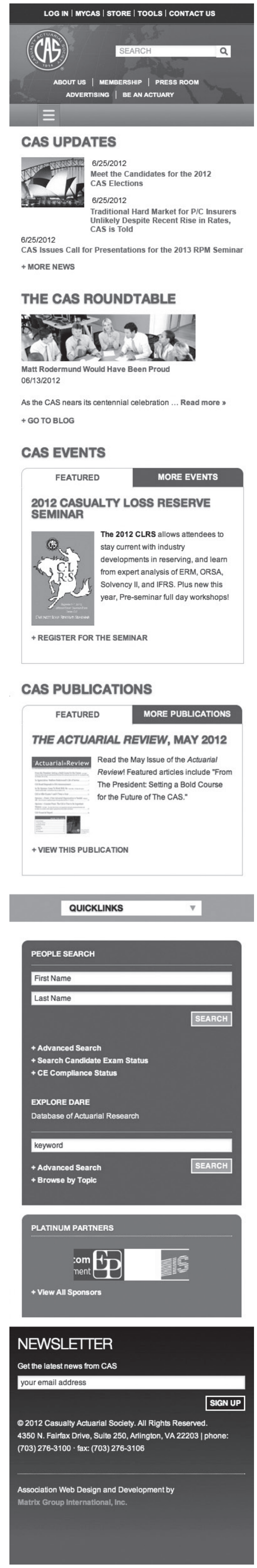
In consideration of what we heard, the redesigned CAS home page presents a clean, modern, and attractive design. The user-friendly navigation uses drop-down menus for quick access to important content.

The new Web site also features an upgraded search engine that will make it easier for Web site visitors to quickly find the information they seek.

All of the most popular Web site features remain—the online CAS member directory, calendar of events, admissions information, CAS publications, and much more.

Launched in July, the new Web site promises a better user experience, especially for the growing number of members accessing CAS information on the go.

With www.casact.org being the face of the CAS to the rest of the world, maintaining a professional, modern, resource-rich Web site is a high priority. The Committee on Online Services and staff welcomes input and feedback on the CAS Web Site. If you wish to contribute any suggestions, send me an e-mail at mboa@casact.org.



CAS Recognizes 2011-2012 Partners

The Society Partners Program is an integrated sponsorship program built around firms that demonstrate a commitment to the CAS and its mission by making an annual financial pledge to support CAS activities. A Society Partnership spans 12 months, from October 1 to September 30, to coincide with the CAS fiscal year. To receive the exclusive benefits of this program, Society Partners committed to a certain level of support at the beginning of the program year. Three tiers of partnership were offered, with exposure opportunities and other benefits commensurate with the level of investment.

The CAS is appreciative of the support provided by its Partners. It is worth noting that Partner support has allowed the CAS to avoid any increases in meeting and seminar registration fees from FY 2009 to FY 2012.

Now in its third year, the CAS is especially thankful for the continued support from our existing Partners and also welcomed new Partners Ezra Penland Actuarial Recruitment, Barrie & Hibbert, Guy Carpenter & Company, Sensomatix, and Earnix!

The complete roster of 2011-2012 Society Partners is highlighted below.

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Pinnacle Actuarial Resources, Inc.
The Firm of Choice

Sensomatix

The 2012-2013 Society Partners Program will be announced in August 2012. Visit the CAS Web Site or contact Megan O'Neill at (703) 562-1742 or moneill@casact.org, to learn more!

Equal Sums?

Pick 10 distinct integers from 1 to 100. Are there two disjoint subsets of these 10 integers that have the same sum? Send solutions to ar@casact.org.

Soccer Tournament Scheduling

Jeff Eddinger asked for a schedule in the minimal number of weeks for a soccer tournament where each of 10 teams plays each other team exactly once, no team plays more than once each week, and there are no more than four games a week.

John Jansen observes that there are 10×9/2, or 45, games, so with at most four games a week, it will take at least 12 weeks for the tournament.

He gives one such schedule below. Break the teams up into pairs so each block is played for two weeks. For example, in the first block, week 1 will include team 1 versus team 7 and team 2 versus team 8, and week 2 will have 1 versus 8 and 2 versus 7. The final two weeks will have a total of five games with the pairs playing each other.

Some solvers added further constraints so as to spread out the three "slots" that are not used, and to have each team play at least two games in any three consecutive weeks. Bob Conger had each team play four games in the first five weeks, three games in weeks 6 to 9, and two games in weeks 10 to 12.

Other solutions were received from David Atkinson, Jack Brahmer, Kyle Bartee, Bryn Clarke, Jeff Dvinoff, Michael Ersevim, John Gutzler, Daniel D. Heyer, Rob Kahn, Alan E. Lange, Richard Marcks, Steve Mathys, John Pagliarulo, Jenni Prior, Jason Russ, Eric Savage, Alan Schrader, Brian Schroeder, Rick Sutherland, Rob Thomas, Brad Tumbleston, and David Uhland.

	5,6	7,8
1,2		X
3,4	X	
	5,6	
1,2	X	
3,4		X
	3,4	
1,2	X	
7,8		X
	7,8	
1,2		X
5,6	X	
	7,8	
3,4	X	
5,6		X

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CAS PROFESSIONAL EDUCATION CALENDAR

September 5-7, 2012
Casualty Loss Reserve Seminar (CLRS)
Sheraton Denver Downtown Hotel
Denver, CO, USA

October 4-5, 2012
In Focus: Taming Cats—Managing Natural And Man-Made Catastrophe Risks
Special Interest Seminar
Baltimore Marriott Waterfront
Baltimore, MD, USA

November 11-14, 2012
CAS Annual Meeting
Walt Disney World Swan Hotel
Lake Buena Vista, FL, USA

March 11-13, 2013
Ratemaking & Product Management (RPM) Seminar
Hyatt Regency Huntington Beach Resort & Spa
Huntington Beach, CA, USA

May 19-22, 2013
CAS Spring Meeting
The Westin Bayshore Vancouver
Vancouver, BC, Canada

IN MEMORIAM

Norman Rosenberg
(FCAS 1947) 1912-2008

Kathleen Williamson Terrill
(FCAS 1986) 1959-2012

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