The Actuarial Review

THE NEWSLETTER OF THE CASUALTY ACTUARIAL SOCIETY • VOLUME 33, NUMBER 4 • NOVEMBER 2006

Carlson Voted President-Elect; Myers to Become CAS President

Christopher S. Carlson has been voted in as president-elect, receiving 971 votes. Carlson, a 1990 Fellow, currently serves on the Board of Directors and the Long Range Planning Committee. His CAS governance experience also includes a term as the vice president-professional education from 2001-2004. The president-elect normally becomes president in the following year 17

Fellows Approve Proposal to Revise CAS Governance Structure

In balloting conducted from August 1 to September 1, 2006, the Fellows of the Society approved changes to the CAS Constitution and Bylaws proposed by the CAS Board of Directors that will alter the governance of the Society. The approved proposal allows the CAS to add up to three additional board members to the CAS Board of Directors, including non-actuaries, with the additional board members to be elected by the board. The three appointees will be in addition to the 12 elected members and three ex officio members (the president-elect, the president, and the immediate past president) 18

Proposals to Expand Associates' Rights Fail

— Proposals that would allow Associates of the Casualty Actuarial Society to vote in CAS elections and serve as directors and officers failed to garner the necessary support of the Fellows, and were defeated in balloting conducted from August 1 to September 1, 2006 18

Developing Our International Vision

BY PAUL BRAITHWAITE — The CAS Centennial Goal states in part that, by 2014, "the CAS will be globally recognized as the pre-eminent resource in educating casualty actuaries and conducting research in casualty actuarial science." However, there are a number of differing opinions about what this means, and to what extent the CAS should emphasize international activities 7

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Editor's Note

By Paul E. Lacko

I want to apologize for the errors in the last issue. A few readers were puzzled or annoyed that we attempted to fix the problem as quickly as possible without fixing the blame at the same time. How several of the *AR* editorial staff did not notice the misspelling of Tom Myers' name, I don't know. But we did. How several of the *AR* editorial staff did not notice that the 2006 Spring Meeting was held in Fajardo, Puerto Rico, I don't know. But we did.

I do know how Clive Keatinge's article was mangled, because I did that myself. Or, rather, I failed to see that it was mangled, and so the mangled version was published. The bad news was that this interfered with Clive's attempt to influence voters' thoughts about some of the CAS election issues. The good news for Clive was that the vote total favored the positions that Clive argued. (It wasn't good news for many of you who voted, and it wasn't good news for those of you with the ACAS designation.)

Opinion pieces typically go through several rewrites, sometimes in response to editorial comments and sometimes to respond to other opinion pieces that will be published in the same issue. Most of the changes from one version to the next are usually relatively minor, but we do have to keep track of which version is to be published. This time, "From the President" and Clive's article argued opposing positions on the upcoming election issues.

By the time the layout arrived for final editing before publication, I had read each of these at least five times before, from the initial submission to the final article. I assumed that the layout contained the final versions of "From the President" and Clive's article.

I had never assumed that before, assumed that the opinion pieces were exactly as I had last seen them. (I will never make that mistake again.) I skipped Clive's article and I skipped "From the President." And sure enough, the one time I cut a corner...

Clive, I apologize. No excuses—I did not do my job.

Fall *Forum* Correction

In the 2006 Fall *Forum*, the Committee on Reserves roster was incorrect. The correct roster is:

Thomas A. Ryan, Chairperson
Jeffrey R. Carlson
Ron Fowler
Aaron M. Halpert
Steven C. Herman
Bertram A. Horowitz
Gloria A. Huberman
Warren H. Johnson Jr.
C.K. Stan Khury
Dale F. Ogden
Christopher Edward Olson
Susan R. Pino
Mark R. Shapland
Wendy W. Tobey

New CAS Journal Call for Papers

The CAS Journal Editorial Board is soliciting submissions to the new CAS journal. The subject matter must fit into one or more of the following categories:

- Research—contains original ideas and new material
- Education—instructs actuaries and others involved in analyzing, modeling, and managing risk
- Practical Application—applies new theories to solve practical problems, exhibits actuarial practices, or compiles current techniques

Membership in the CAS is not a prerequisite for submitting papers and submissions by non-CAS members are encouraged. A detailed guide for journal submissions is available at: http://www.casact.org/about/index.cfm?fa=guides.

Atlanta to Host '07 Ratemaking Seminar

By John Winkleman, Chair, Committee on the Ratemaking Seminar

Mark your calendars! In March 2007 the CAS will hold its annual Seminar on Ratemaking in Atlanta, Georgia. All are welcome to attend the event, which will be held at the Hyatt Regency Atlanta on March 8 and 9. On the afternoon of March 7, registration day, a limited attendance presentation skills seminar, tailored to help technical speakers develop and deliver more powerful presentations to a non-technical audience, is also scheduled.

Mark Lyons, president and chief operating officer at Arch Insurance Group, will deliver the keynote address. Over 40 concurrent breakout sessions are planned—providing a wide variety of educational opportunities for actuaries and other insurance professionals. The presentation of new topics along with revamped popular sessions from years past will highlight the meeting.

Sessions for students as well as long-established insurance experts will be offered in at least the following areas: data and technology, workers compensation, commercial lines, personal lines, reinsurance, and risk and capital management. Additionally, submissions received in response to the Committee on Ratemaking Call Paper Program will be presented and discussed.

Photo courtesy Hyatt Regency Atlanta

View of the Hyatt Regency Atlanta, situated in the center of town.

Located in the heart of downtown Atlanta, the Hyatt Regency is an easy commute from most places in the U.S. Look for the brochure and registration information in the mail and online in the near future. The members of the Ratemaking Seminar Committee hope to see you there!

Attend the 2007 Enterprise Risk Management Symposium

The 4th Annual Enterprise Risk Management (ERM) Symposium, sponsored by the Casualty Actuarial Society, the Society of Actuaries (SOA), and the Professional Risk Manager's International Association (PRMIA) will take place March 28–30, 2007 in Chicago, Illinois.

The ERM Symposium will cover various topics within the risk management field with a focus on analysis and practical tools. Presentations will range from discussions of financial and operational risks, creating value through ERM, interaction between risks, and integrated ERM.

Take advantage of this opportunity to broaden your skills, learn more about the current and emerging trends of risk management, and keep up with the latest ERM developments.

Past ERM Symposia have featured speakers on a range of topics and general ERM themes including ERM and the role it plays in a particular company or industry, value creation through ERM, risk capital management, and the theoretical foundation of ERM.

As the ERM Symposium date nears, more information on registration, papers topics, and presentations will be made available at http://www.ermsymposium.org.

Dear Editor:

The "Noble Experiment" launched with the recent purchase of the *Philadelphia Inquirer* provided that newspaper's editor, one Amanda Bennett, with enough media exposure to help me recall that Ms. Bennett, daughter of CAS Fellow Norman J. Bennett, was the first, and perhaps only, professional reporter to be given space in the *AR*.

When Matt Rodermund learned that Ms. Bennett was planning to attend one of the Society's semi-annual meetings (c. 1974), he prevailed on her to write a report on the event for publication in his creation. At the time I think Ms. Bennett was about to be employed by the *New York Times*; her by-line subsequently appeared in the *Wall Street Journal*.

Little did the editorial board of the fledgling *AR* suspect that its guest reporter would one day become editor of a big-city daily.

Very truly yours,

—*George D. Morison, FCAS*

Midwestern Actuarial Forum Makes CAS Trust Donation

The Midwestern Actuarial Forum (MAF) has donated $10,000 to the CAS Trust. MAF President Nasser Hadidi reported that MAF members unanimously approved the contribution at the Regional Affiliate's fall meeting in Madison, Wisconsin on September 29, 2006.

MAF encompasses the states of Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin. Established in 1979, the CAS Trust is a nonprofit 501(c)(3) organization that affords members and others an income tax deduction for contributions of funds to be used for scientific, literary, research or educational purposes.

The CAS graciously acknowledges MAF's generous gift to the CAS Trust.

Speak Up!

The Actuarial Review always welcomes letters and story ideas from our readers. Please specify what department you intend for your item—letters to the editor, news, Brainstorms, It's a Puzzlement, etc. Send your comments and suggestions to:

The Actuarial Review
Casualty Actuarial Society
4350 North Fairfax Drive, Suite 250, Arlington, Virginia 22203 USA

Or e-mail us at AR@casact.org

Methods or Models?

Insurance companies, consulting actuaries, and insurance advisory organizations are intensively researching a variety of reserving models, according to one speaker at the 2006 Casualty Loss Reserves Seminar held this past September. At one session, a panelist asked the members of the audience to raise a hand if their reserve estimates came from models as opposed to methods. Not a single hand went up.

Reserving actuaries apparently are still relying on the old workhorses—development triangles, claim severity and claim frequency trends, Bornhuetter-Ferguson projections, and the like—to get the job done. We like the concept of reserving models, so we attend these sessions. We are looking for some actuary somewhere who actually uses a model or two and has succeeded in having the results accepted by the non-actuaries who have a stake in the reserving process or its reported results. The rest of us will switch to models after we see one good demonstration that another company's accountants, claims managers, senior executives, rating analysts, regulators, and members of the board of directors understand models, appreciate them, and even come to love them.

The good thing about models is that they produce distributions with means and variances. You make your assumptions at the beginning of the reserving process. At the end, you get actual measurements of how much variation can be expected around the values you select and report. You get confidence intervals. You get means, modes, and medians.

The good thing about methods is that they don't produce distributions and variances. You apply your actuarial judgment all through the reserving process, from assumptions at the very beginning to final selections at the very end. Your results are single values, things an accountant can put in a financial statement. You apply a variety of methods, and you get some sense of the spread in possible outcomes. Everybody already knows that "best" estimates are fuzzy, so why make a big production out of the fuzziness?

Models are nice, but methods are fast. Timing, of course, comes into play during the reserving process. You get a few days (or hours?) to produce results from raw data. PCs can do amazing things very fast, but how many Monte Carlo simulations and curve fits can you set up, run, and analyze in those few days? What do you do now if the loss distributions that seem to fit best this year are quite different from the best-fitting ones last year?

As was pointed out in more than one CLRS session, another problem we face in fitting models is that we often have relatively few data points with which to do serious modeling work. If the model uses a reasonable number of variables, it results in a poor fit. If we overspecify the model—use too many variables for the number of data points—then we force the model to fit the data, but the good-looking model has no predictive power.

I attended several CLRS sessions that described and discussed reserving models, figuring they would help familiarize me with current developments. (I won't be the first actuary in the country to switch from reserving methods to reserving models, some quarter-end, but I don't want to be the last, either.) One session was titled "Bayesian Estimation of State Space Reserving Models." That sounded intriguing. Esoteric. Leading-edge. It was all of those. And almost incomprehensible.

That did seem like an awful lot of parameters to estimate from one little paid loss development triangle. Was that why the model fit the data so well?

Several attendees, maybe more—maybe a lot more—probably found this presentation straightforward and maybe even simple from beginning to end. I wasn't one of them, and I know I wasn't alone. I sort of understood the overall outline of the method, and I followed presenters through the minefield of mus and sigmas, but then the presenters took off running and left me in the dust.

Please don't take this as criticism of the presenters. To the contrary, every seminar should include at least two or three presentations like this, where the best and the brightest theorists can congregate and collectively shine their beacons of brilliance. I'm thankful that an average-at-best, 60-watter such as me, is allowed to sit in.

Anyway, the presenters displayed the full model on the screen—line upon line of subscripted Greek letters punctuated by plus signs and equal signs and even a few signs I never saw

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D.W. Simpson Makes CAS Trust Donation

The Trustees for the CAS Trust (CAST) are pleased to announce that D.W. Simpson & Company has donated $10,000 to the Trust in September 2006. This brings the total contribution of the D.W. Simpson & Company to the Trust to $110,000 over the past several years. The CAST was established in 1979 as a nonprofit 501(c)(3) organization to afford members and others an income tax deduction for contributions of funds to be used for scientific, literary, research, or educational purposes. The CAS is appreciative of D.W. Simpson & Company and its employees for this milestone contribution toward advancing actuarial science.

ASTIN 2007 Keynote Speakers Announced

By Becky A. Yeager, CAS Communications Coordinator

The CAS will proudly host the 37th International ASTIN Colloquium, during which ASTIN's 50th Anniversary will be celebrated. This event will be held June 19-22, 2007 at the world renowned *Disney's Contemporary* Resort in Lake Buena Vista, Florida in conjunction with the CAS Spring Meeting.

Four keynote speakers for the Colloquium will address topics ranging from the history of ASTIN to securitization and its effect on markets. On Wednesday, June 20, a joint day of CAS and ASTIN meetings, there will be two keynote presentations. Naomi Robbins, an expert on graphically displaying data, will speak in the morning session on the topic of "Visual Presentation of Quantitative Information." That afternoon, Morton Lane, president of Lane Financial LLC and the 2001 Charles Hachemeister prize winner, will present the lecture "Does Securitization Threaten to Replace, or Improve, Traditional Markets?"

On Friday morning, Stephen P. D'Arcy, professor of finance and the John C. Brogan Faculty Scholar in Risk Management and Insurance at the University of Illinois at Urbana-Champaign, will present a thought-provoking discussion on "ASTIN's Next Greatest Contributions." Friday's session will conclude with a much anticipated presentation by the world renowned actuary Hans Bühlmann, professor of mathematics at the Swiss Federal Institute of Technology in Zurich, providing his insight on "The History of ASTIN."

The 37th ASTIN Colloquium in celebration of ASTIN's 50th anniversary will be held on 19–22 June 2007 at the world renowned *Disney's Contemporary*® Resort near Orlando, Florida, United States of America. ASTIN was founded in New York City in 1957 and the Casualty Actuarial Society is very pleased to be the host for the jubilee.

The ASTIN Colloquium provides a forum for actuaries from around the world to stay abreast of current issues affecting the insurance industry and the actuarial profession, as well as providing the opportunity for attendees to interact with other actuaries on a professional and social level. The ASTIN Colloquium brings together both academics and practitioners, and offers an outstanding forum for the exchange of knowledge among actuaries of different countries and different disciplines in the application of research to practical problems. We expect more than 250 delegates from more than 30 countries to participate.

The highlights of the social program include an afternoon and evening at the Kennedy Space Center on Thursday and the 50th Anniversary Gala, to be held Friday evening at EPCOT® Center.

The ASTIN Scientific Committee invites all CAS members to contribute to the 37th International ASTIN Colloquium by presenting a paper. Currently the committee welcomes papers on the following topics: risk management of an insurance enterprise, pricing risk, and liability risk. Papers on topics other than those identified above will be considered by the ASTIN Scientific Committee and may be accepted at the Committee's discretion. Papers should be submitted in their final form by January 31, 2007. Authors will not have the opportunity to revise their papers.

For more information on the 2007 ASTIN Colloquium visit the CAS Web Site www.casact.org or the ASTIN Web Site www.actuaries.org/ASTIN2007.

Developing Our International Vision

The CAS Centennial Goal states in part that, by 2014, "the CAS will be globally recognized as the pre-eminent resource in educating casualty actuaries and conducting research in casualty actuarial science." However, there are a number of differing opinions about what this means, and to what extent the CAS should emphasize international activities.

Roughly 90 percent of our current members reside in the U.S., so many of those members ask, "What's in it for me?" On the other hand, it appears that a growing percentage of our members fall into one of many categories that would interest them in international activities. Although we do not currently have statistics available, I expect that a large percentage of our members now work for multinational companies or companies, such as consulting firms, that serve international clients. Many of our members either have worked or wish to work outside the U.S. sometime during their careers. Other members who focus on research wish to exchange ideas with researchers throughout the world. In sum, many of our members would like their CAS credentials to have greater recognition throughout the world.

We have already taken great strides in our goal to be connected through a meaningful partnership with other actuarial associations that wish to develop a distinct casualty practice. We recently gave the Indian Insurance Institute permission to republish the *Foundations* text and developed mutual recognition agreements with the Faculty of Actuaries, the Institute of Actuaries (U.K.), and the Institute of Actuaries of Australia.

During my presidency, I worked with our executive council and our board of directors to clarify what we want to achieve with this goal and identify tactical plans concerning how best to focus our resources and take advantage of the many possible roles we can play in the international arena. Although more member input, analysis, and discussion is needed, I am happy to say we have made significant progress in drafting this international vision.

A first draft of the CAS International Vision was presented and well received at the August executive council meeting. The plan took into consideration both CAS members and our sister organizations around the world. In the CAS International Vision, the international actuarial arena, or non-CAS world, was divided into nine groups in order to successfully address each distinct environment. The nine groups include:

- U.K. and Australia;
- Western Europe, Japan, and South Africa;
- India;
- China, including Taiwan and Hong Kong;
- Additional countries in Europe and Asia with semi-developed domestic insurance industries, such as Poland and Korea;
- Latin America, including Mexico;
- Newly emerging economies such as sub-Saharan Africa;
- The International Actuarial Association and ASTIN; and
- The international academic community.

Each of these groups poses different opportunities, and, therefore, needs different solutions and approaches. For example, to cultivate our connection with the United Kingdom it was suggested that we increase our involvement on Institute and Faculty of Actuaries (IOA) committees. For India, in order to broaden our pool of possible candidates, we should review the costs of overseas exams and materials. And in China it was recommended that we work more closely with the Society of Actuaries of China and support an upcoming seminar.

At its September 2006 meeting, the CAS Board also began discussing some of the broader questions relating to this goal:

- To what extent should we emphasize international activities? How can all our members benefit? Are we spending too much or too little in this area?
- Should we focus on assisting organizations in other countries, or actively work to grow CAS membership throughout the world?
- To what extent can our syllabus material be less nation- and culture-specific but still be effective for educating U.S. actuaries? Can we develop readings that are both meaningful and understandable to a broader international audience?
- Which activities should be coordinated through the International Actuarial Association or its ASTIN section?

The board concluded that we need to focus our efforts by drafting a brief statement of our objectives to address these complex questions. This will be coordinated by our vice president-international, Amy Bouska, and the rest of our executive council, with input from our Long-Range Planning Committee and hopefully many of you! As always, your opinions are valued.

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before. To my surprise, a question popped into my mind, making me wonder if somewhere in there was a spark of comprehension. "That seems like a lot of parameters to estimate from one little paid loss development triangle, doesn't it?" I whispered to the actuary just to my right. "I'm lost," he whispered back. No help there. So I commanded the question to slither back into the depths of subconsciousness whence it had emerged and never again seek the light of spirited inquiry.

The presenters showed graphs of model predictions versus actual data points, and the fit was remarkably good. But that question has hung around, bugging me, ever since. That did seem like an awful lot of parameters to estimate from one little paid loss development triangle. Was that why the model fit the data so well?

Earlier this year, my CFO asked the vice president-finance and me to give a presentation about loss reserving to the board of directors of our holding company at their next board meeting. The board members wanted to know the process by which we come up with the loss liabilities that we report in our financial. How do we estimate the liabilities? How do we know the estimates are accurate? How should this information feed into their strategic planning?

That's what I like best about the generally accepted actuarial methods—they are fairly easy to explain to someone with some insurance experience, especially if I can prepare a couple graphs or charts ahead of time.

Part of my presentation was a brief description of the reserving methods I use for our major line of business. I also described the reserving methods our Appointed Actuary uses, and I explained why his are different from mine and why it's a good thing to apply all these methods, review all the results, and then make final selections of the estimated liabilities. Everyone understood my explanations—here's why this type of method is useful, here's the variation we employ, and here's what it tells us. (Our Appointed Actuary is an independent consulting actuary. One of his tasks is to make sure my methods and assumptions are reasonable. One of my tasks is to make sure his methods and assumptions are reasonable. When his results and mine are close—which is almost always—senior management feels more confident about our financial position.)

We stressed in our presentation that our reserve work undergoes additional actuarial scrutiny. An actuary at our auditing firm also reviews all the reserve work, for example, and regulatory actuaries review our work every few years, and so on and so forth. The point we wanted to drive home was that the board could rest assured that, so much actuarial scrutiny meant that our reserve estimates were as good as they possibly could be.

After the meeting, one of the board members came over to me and said, "So what? What's the point of so many actuaries? You all look at the same data, you all go through the same training, and you all think the same way. Of course you're all going to come up with the same results!"

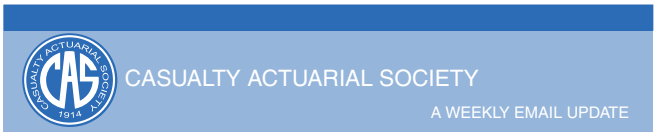
Sometimes you just can't win.

CAS E-Mail Bulletin Streamlines Messages to Members

By Becky A. Yeager, CAS Communications Coordinator

Launched in August, the new Casualty Actuarial Society (CAS) weekly e-mail bulletin provides concise information in a modern and professional way. Developed in an HTML format, the bulletin offers quick links to the new CAS Web Site and reminds CAS members of upcoming deadlines, events and meetings, and other newsworthy topics. Using HTML allows us to provide you with color photos and graphics and as well as more user-friendly links. You'll still get the same clear, insightful, and reliable information that you expect from the CAS—and we think you'll enjoy reading it even more in HTML.

The weekly e-mail bulletin serves as a replacement for the frequent, single-topic e-mails that CAS members have received in the past. Sent out every Wednesday, the bulletin highlights a topic of high importance for each particular week along with useful reminders. In addition to these items, the bulletin contains a calendar of events to help CAS members plan for upcoming conferences. By streamlining the information that members receive, the bulletin will help to organize the many messages of the CAS and insure that all members receive the most up-to-date information available.



This online banner welcomes members to the new news feature.

Non-members are also welcome to sign up for the weekly e-bulletin. To be added to the e-mail list please visit www.casact.org and enter your e-mail address in the box in the lower right-hand corner of the page. Registration is free and you may unsubscribe at any time. Once you submit your e-mail address you will receive a confirmation from the CAS Office. If you have questions or comments regarding the new bulletin, please contact Mike Boa, CAS director of communications and research, at mboa@casact.org.

A Review of *Data Management: Databases and Organization*, Fifth Edition

by Richard T. Watson [John Wiley & Sons Inc., 2005, $101.95]

Reviewed by David Hudson

Actuarial work relies on data. As such, ensuring appropriate data quality and availability is the concern of every actuary. The CAS research working party on Data Management and Information Educational Materials was formed to identify key educational resources on data issues for actuaries. The working party is reviewing the literature on the topic and this review is the second of several that will be published.

The introductory data management text, *Data Management: Databases and Organization*, focuses on the core skill of data modeling using SQL (structured query language) to implement the data models. The text also covers managerial perspective of data management, database architecture, emerging technologies, and data integrity.

Overall, this text is very well written. The topics are self-contained, although the concepts of data modeling and SQL run throughout so those sections should not be skipped. Because of the book's length (approximately 600 pages), it is probably best for actuaries to use the text as a reference book on particular topics. Watson divides his book into five sections. A brief synopsis of each follows.

The author thoroughly illustrates the concept of normalization as a method for increasing the quality of a database design.

Section 1, "The Managerial Perspective," defines the concept of organizational memory, which includes not only computers, but also people, paper files, manuals, and reports. He also draws distinctions between data, information, and knowledge. According to Watson, "data are raw, unsummarized, and unanalyzed facts," while "information is data that have been processed into a meaningful form." Finally he states that "knowledge is the capacity to use information." Watson makes the interesting point that the preceding perspectives on data and information are relative. One person's information is another person's data.

In section 2, "Data Modeling and SQL," Watson considers data modeling and SQL skills as fundamental to data management. As such he devotes approximately half of the book to this topic. The style of this section is very straightforward and should be accessible to any actuary with some exposure to relational databases, such as Microsoft Access, SQL Server, or Oracle. Watson addresses in detail the basic building blocks of data modeling: modeling a single entity, one-to-many relationships, many-to-many relationships, one-to-one relationships, and recursive relationships.

The author repeatedly uses the same approach to explain new concepts, thus making the text easy to follow. First, he builds his examples using a standard data modeling diagramming syntax. Second, as each new modeling concept is introduced, a model is developed and then implemented in SQL. This is an effective technique for both data modeling and SQL since the concepts reinforce each other.

Watson also uses examples from standard relational databases such as Access and Oracle. While the book is not an Access reference and many advanced SQL features are not supported in Access, the text does give a good indication of the theoretical underpinnings about how a relational database product such as Access should be used. The text is filled with numerous exercises on both data modeling and SQL. It is a good primer for those actuaries that are interested in moving beyond Access.

The author thoroughly illustrates the concept of normalization as a method for increasing the quality of a database design. He goes through the development of six normal forms and describes the issues that these normal forms resolve. This is perhaps a little advanced for most actuaries, but it is interesting reading if one is willing to devote the effort.

Finally, Watson provides an "SQL playbook" that contains 61 sample queries that should handle most of the data manipulation tasks that an actuary may encounter.

Section 3, "Database Architectures and Implementations," deals with more of the technical aspects of data management such as data structures and storage. It also provides a decent

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background on data processing architectures such as client/server technology. If nothing else, this section and Section 4 define much of the terminology that is used in many IT shops today. This is of great use to actuaries who need to understand the key concepts of various technologies to liaise with their IT departments.

Watson devotes a chapter in this section to object-oriented (OO) data management. He does a good job of describing the OO paradigm and then contrasting it with the relational paradigm. Since the relational model is primarily used in data management, and the OO model is used primarily in software engineering, Watson posits that it is important to be able to translate between the two. Among the differences he cites is that the OO paradigm has its basis in the software engineering principles of coupling, cohesion, and encapsulation, while the relational paradigm is based on the mathematical concepts of set theory.

Section 4, "Organizational Memory Technologies," covers a potpourri of technologies. Watson devotes a chapter in this section that touches on data warehousing, data mining, and the multi-dimensional database (MDDB) or cube environment. Given that MDDB is (arguably) the best storage arrangement for actuarial triangles, this section should be of great interest to actuaries. Unfortunately, it barely scratches the surface on data warehousing and data mining. He also devotes two chapters to the Internet and provides some extensive examples on how to use SQL within Java. Finally, he closes the section with a good treatment of XML (extensible markup language) and its emerging use as a data management standard.

The final section, "Managing Organizational Memory," covers two topics that most actuaries should find of interest: data integrity and data administration. In this time when actuaries are being asked to become advocates for data quality, it is important for them to understand what data quality really means. Watson states that maintaining data integrity involves three goals:

1. Protecting the existence of the data so it is available whenever it is needed;
2. Maintaining the quality of the data so that it is accurate, complete, and current; and
3. Ensuring confidentiality of data so that only those authorized can access it.

He then describes many techniques to achieve these goals.

The author also covers what he calls the 18 dimensions of data quality. As an example, let's look at three of the dimensions—Accuracy, Timeliness, and Accessibility—and what conditions Watson sets for high quality (see Table 1, below).

Table 1

Dimension	Conditions for high-quality data
Accuracy	Data values agree with known correct values.
Timeliness	A value's recentness matches the needs of the most time critical application requiring it.
Accessibility	Authorized users can readily access data values through a variety of devices from a variety of locations.

These three dimensions, as well as the other 15 dimensions outlined in the book, are an ongoing pursuit and not a destination. It is worthwhile for actuaries to look at all 18 dimensions and see how each of their organization's data stacks up against them.

Overall, I would highly recommend *Data Management: Databases and Organization* to those actuaries who are interested in learning more about the principles and challenges of data management.

CAS Releases White Paper on Education Strategy

After years of research and discussion, the CAS Board of Directors has endorsed a proposed strategy for future CAS education, with significant implications for both basic education and continuing education. The board agreed during its meeting in September 2006 that it is critical to gather input from the stakeholders in the CAS education process before implementing the strategy.

The "White Paper on CAS Education Strategy" has been developed to present the strategy to stakeholders and invite feedback. The paper includes the board's rationale for the proposed strategy and supporting background information. Interested parties are encouraged to provide feedback on the proposed strategy, which will help shape the next phase of the discussions as the board continues its deliberations in 2007.

Also during the September board meeting, the board agreed to table the discussion of discontinuing awarding the ACAS credential until after the CAS education strategy has been developed. The board has decisively stated that under no circumstances would the new strategy involve automatically awarding Fellowship to current Associates.

The "White Paper on CAS Education Strategy" will be available through a link on the home page of the CAS Web Site. A survey form will also be provided to facilitate feedback, and all feedback submitted before January 31, 2007 will be considered. Contact the CAS Office at office@casact.org to receive a hard copy of the White Paper or with any questions.

Synopsis of 2006 Reserving Call Papers

By Gloria A. Huberman, Member, CAS Committee on Reserves

Today, more than ever, the reserving arena is receiving a great deal of attention. Complex issues that are challenging the property/casualty insurance industry affect the actuarial profession and the reserving process within our profession. We continually strive to improve the reserving concepts and maintain our high degree of professionalism. To assist actuaries in enhancing their reserving knowledge, the CAS Committee on Reserves sought papers on several relevant topics for its 2006 Call Paper Program. Perhaps as a result of all the focus reserving has been exposed to of late, we received an unusually large number of proposed papers.

The committee accepted 12 papers, many of which were presented at the 2006 Casualty Loss Reserve Seminar (CLRS) in September. Glenn Meyers received the 2006 Reserves Prize for his paper "Estimating Predictive Distributions for Loss Reserve Models." An independent judging committee recognized Meyers' paper as most worthy of enhancing the current CAS literature on reserving. All of these papers can be found in the CAS 2006 Fall *Forum* and on the CAS Web Site. A brief summary of each of the papers follows.

Klaus Schmidt's paper "Methods and Models of Loss Reserving Based on Run-Off Triangles: A Unifying Survey" compares some of the more important loss reserving methods that are based on run-off triangles. The paper shows that the loss development, chain-ladder methods, as well as the Cape Cod and additive methods, can be viewed as special cases of the general Bornhuetter-Ferguson method. It also demonstrates that credibility prediction, Gauss-Markov prediction, and maximum likelihood estimation can provide significant contributions to understanding various loss reserving methodologies.

Several papers build on existing reserving methodologies, offering innovative approaches and enhancements to both loss and LAE methods. "A Nonlinear Regression Model of Incurred but Not Reported Losses," by Scott Stelljes, shows how such nontraditional statistical models as nonlinear regression, generalized linear, and multivariate adaptive regression splines (MARS) can be fitted to historical incremental losses to project future paid and incurred losses. Most of the current methods for projecting ultimate losses focus on estimation of loss development factors that relate the emergence of losses to the amount of losses already reported. This paper presents a model for predicting incremental losses as a function of exposures, calendar period, and development age. "Parameter Estimation for Bornhuetter/Ferguson," by Thomas Mack, focuses on an alternative approach to derive the development pattern used in the Bornhuetter-Ferguson method as historically the chain ladder method has assumed a multiplicative connection between past and future losses, while the Bornhuetter-Ferguson method established an additive connection (i.e., independence). Contrary to the conventional Bornhuetter-Ferguson approach, this alternative method of deriving and selecting a development pattern does not rely on the use of chain ladder elements. This approach also adjusts premium data to account for rate level changes. "'Adjusting & Other' Reserves According to the 'Loss-Activity' Method," by Paul Deemer, develops a new method of calculating ULAE (Adjusting & Other) reserves, utilizing loss activity as the base, rather than paid losses, as traditionally used in the paid-to-paid method. "Multilevel Non-Linear Random Effects, Claims Reserving Models, and Data Variability Structures," by Graciela Vera, offers reserving models that tweak traditional reserving approaches by introducing random effects models, focusing on the close dependency of IBNR on data variability structures and variance models.

Three papers employ predictive distributions in their models. Meyers' prize-winning paper demonstrates a Bayesian method for estimating individual insurers' distribution of future loss payments. An analysis of reported reserves and their subsequent development in terms of the predictive distribution calculated by this Bayesian methodology is also included. This method is meant to address the problem of overly wide confidence intervals. "A Method for Projecting Individual Large Claims," by Karl Murphy and Andrew McLennan, demonstrates that by individually projecting the ultimate position of large claims, we can explicitly apply policy or contract limits to the gross results and estimate the variability of the aggregate loss reserve portfolio. This method is also a useful tool for estimating reinsurance recoveries more accurately. "Estimation of Loss Reserves and Confidence Intervals Using Policy and Claim Level Detail Predictive Modeling," by Jan Lommele and Jim Guszcza, provides a framework that employs predictive modeling to estimate future claim payments using claim-level data. Essentially, covariates (predictive variables) are used to improve estimates of future payments. The paper also describes how bootstrapping techniques can be applied to claim-level data to estimate reserve variability.

Reserves Papers page 13

Enterprise Risk Management for Property/Casualty Insurance Companies

By Shaun Wang, CEO/Executive Director, ERM Institute International, Ltd.

The Casualty Actuarial Society, the ERM Institute International, Ltd. and the CAS/SOA Risk Management Section have released their jointly commissioned research report titled "Enterprise Risk Management for Property-Casualty Insurance Companies."* I coauthored the report with Robert Faber (executive, underwriter), and several highly regarded CAS members contributed valuable comments. The research report proposes a new conceptual framework for enterprise risk management (ERM) and applies it to property/casualty insurance companies.

The report defines ERM as the discipline of studying the risk dynamics of the enterprise, the interactions of internal/external players and forces, and how players' actions (including the risk management practices) influence the behaviors of the risk dynamics, with the ultimate goal of improving the performance and resiliency of the system. This definition takes an engineering-like approach and paves the way for a "scientific" approach. The authors believe that risk dynamics modeling holds great promises when combined with a true understanding of the dominant risk drivers.

The report advocates that an actionable ERM should be embedded in each step of the company's decision-making processes. ERM should start with an analysis of the business model and the company's strategic position in relation to the external environment, followed by an examination of the company's internal operational processes and how they have affected the company's financial performance.

An enterprise risk model for a property/casualty insurer must give due consideration to (at least) the following dominant risk dynamics:

1. Inherent risks associated with the product design, risk origination, risk selection, and risk valuation as embedded in the marketing, underwriting, pricing, claims handling, and reserving processes;
2. Constraints imposed by rating agencies and regulators;
3. Actions and behaviors of competitors (market leaders and participants);
4. Exposures to catastrophic or correlated losses (on both asset and liability sides of the balance sheet); and
5. Impacts of market valuation fluctuations and accounting conventions on company balance sheets and earnings.

The report highlights a basic truth that risk dynamics cannot be known completely due to the multiple forces at work, but knowledge about the risk dynamics can be gained through experience, insights, and modeling. One should try to objectively evaluate the knowledge level of the risk dynamics and the competitive edge relative to competitors. A common pitfall is that when one has little knowledge (or less than a competitor's knowledge) about the risk dynamics of a line of business, for example, or fails to identify the underlying trends, one tends to perceive the risk dynamics as "pure volatility," and put his or her faith in diversification. Although diversifying a portfolio of risks is usually beneficial, such diversification has to be weighed against the increased risk due to the reduced knowledge one has for each risk. Lack of knowledge of the underlying risks often shows up in the form of inadequate reserves, which is a lagging indicator of poor enterprise performance.

The report documented empirical findings that, for commercial lines (including workers compensation and general liability), large national insurers tend to show worse underwriting results than the small regional companies. For general liability and workers compensation, the inherent loss reporting delay provides a backdrop for the varying company behaviors in underwriting, pricing, and reserving practices. Differences in underwriting/pricing behaviors (e.g., average number of years of experience on the book, underwriter turnover, extent of reliance on experience rating modification, etc.) in small companies versus large companies provide explanations for the differing underwriting results.

The report recognizes that an enterprise has multiple risk dynamics at multiple levels (e.g., company, business segment, and product levels) with multiple forces (e.g., financial rating concerns at company level, competition at local business segment level, and contract terms at product level). To gain an overall picture we need to understand the interactions of risk dynamics at different levels and to reconcile the multiple perspectives. While traditional actuarial analysis focuses more on the individual risk level, ERM advocates a high-level analysis that incorporates the macro risk drivers such as market competition, natural catastrophes, the cost fluctuation of hedging (through reinsurance), and regulatory constraints on profitability.

* The report is available at www.ermii.org.

The value proposition of ERM is self-evident in the premise that actions taken by key participants (for example, insurance company executives, underwriters, actuaries, rating agencies, and regulators) can exert great influence on the behaviors of risk dynamics. Indeed, underwriting and pricing of the current book is a critical first line of defense in risk management, and is the first area that the insurer should consider in altering its future objectives and risk profile.

Properly constructed risk metrics and valuation models can shed light on the behavior of risk dynamics; they are powerful forces and essential tools for taking a structured and disciplined approach that aligns business strategies with the processes, people, technology, and knowledge within the organization. In the meantime, risk modeling itself introduces an inherent risk, namely the model risk, which is not random by nature. The report analyzes the drivers of pricing and reserving cycles and develops risk valuation models for loss ratio volatility, reserve development volatility, and risk capital requirements.

The research report advocates the use of "leading indicators," rather than "trailing indicators," in guiding business decisions. Actuaries have been predominantly relying on experience-based trailing indicators that are subject to estimation bias due to information lag and incentive problems such as tying bonuses with top-line premium growth. What the insurance industry needs are leading indicators that can be developed by closely monitoring rating level changes per unit of exposure, emerging trends, potential impacts of new regulation or new technology, actions by key competitors, and changes in competition due to the entry or exit of other insurers.

In the past, the property/casualty insurance industry has focused much time and energy on the prediction of the loss component of the loss ratio. The problem with so much emphasis on this component is that it is a trailing indicator. Only after several years can one effectively draw conclusions on the longer tail lines. Going forward, we must focus more attention on the denominator in the loss ratio calculation, namely the effect of rate levels on exposure. Rate levels, which are generally known at the inception date of the policy, can be considered leading indicators that are more timely and effective in predicting loss ratios, and therefore pricing cycles.

ERM is a journey and an ongoing learning process that requires a humble attitude and a disciplined approach. Implementation of an ERM framework should enable a property/casualty insurer to accomplish the following:

- A clearly-defined business model that includes focusing the business, enhancing the competitive edge, and establishing a risk tolerance level;
- A well-articulated risk appetite and risk strategy, risk exposure accumulation;
- A well-integrated business process for sales, marketing, underwriting, pricing, claims handling, reserving, and investment functions and processes; and
- A developed and tested robust risk valuation and risk model that are operational for day-to-day business management.

Although the specific contexts are pertinent to property/casualty insurers, the risk dynamics concept and the risk valuation methodology presented in this paper are universal and applicable to other industry sectors such as life and health insurers.

AR readers can address their comments to Dr. Shaun Wang at swang@ermii.org. AR

Reserves Papers From page 11

Two papers discuss ways to correct for correlation amongst subportfolio estimates such that the reserves are not overstated when aggregated. David Clark was motivated by the research performed by the 2005 CAS Working Party on Reserve Variability to look into the problem of measuring correlation between reserve segments. His paper "Variance and Covariance Due to Inflation" demonstrates how the covariance between reserves segments due to common sensitivity to inflation can be easily modeled, which then allows one to estimate variance at a company level. "Optimal and Additive Loss Reserving for Dependent Lines of Business," by Klaus Schmidt, demonstrates how to use univariate and bivariate models to improve estimation of prediction errors when aggregating a number of subportfolio estimates.

The last two papers discuss various measures that are employed to assess the reasonableness of the reserve estimates. "Measuring Loss Reserve Uncertainty," by William Panning, shows a straightforward way to measure loss reserves and the associated uncertainty using the coefficient of variation of estimated future loss payments. Its results can enable a firm to estimate capital adequacy, forecast future payments, and determine whether deviations between actual and expected payments warrant further attention. "Considerations Regarding Standards of Materiality in Estimates of Outstanding Liabilities," by Christina Gwilliam, Emmanuel Bardis, Stephen Lowe, and Atul Malhotra, explores the relationship of materiality, volatility, and the skewness of the loss distribution. The paper presents approaches to estimate materiality using the framework of statistical hypothesis testing and discusses various factors that should be considered in selecting materiality standards.

We encourage everyone to take some time to read these thought-provoking papers that go beyond the theoretical, providing valuable insights and suggestions to help improve the reserving function. AR

The R Programming Language—My "Go To" Computational Software

By Glenn Meyers

My involvement in a number of predictive modeling projects in the past few years has given me the opportunity to work with professional statisticians. These statisticians introduced me to something that I believe will be useful to many actuaries.

The R programming language is a software environment for statistical computing and graphics. R is widely used for statistical software development and data analysis. R's source code is free and available at the Web Site www.r-project.org where precompiled binary versions are provided for Microsoft Windows, Mac OS X, and other UNIX-like operating systems.

R is the result of a collaborative effort with contributions from all over the world. R was initially written by Robert Gentleman and Ross Ihaka—also known as *"R & R"* of the Statistics Department of the University of Auckland. Since mid-1997 there has been a core group with access to write the actual source code for R.

R supports a wide variety of statistical and numerical techniques. R is also highly extensible through the use of packages, which are user-submitted libraries for specific functions or areas of study. A core set of packages are included with the installation of R, with over 700 more available at the Comprehensive R Archive Network (CRAN) (http://lib.stat.cmu.edu/R/CRAN/) as of 2006.

The models you can fit with R include generalized linear models, various tree-based models, and neural nets. This is a very incomplete list. One of my favorites is the generalized additive model, which is similar to the generalized linear model except that it allows non-linear relationships with the independent variables.

R also allows you to build your own functions and it even has functions that operate on functions. For example, I once wanted to find the limited average severity for a *log-t* distribution. To do this I wrote a function for 1 minus the cumulative distribution function for the *log-t*, and used a function called "integrate" that takes a function and the limits of integration as input.

R also has an all-purpose optimizer function that I use to calculate maximum likelihood estimates in fitting claim severity distributions and loss reserving models. To illustrate these applications, I placed R code on the CAS Web Site that is connected with my submission to last year's COTOR Challenge (http://www.casact.org/cotor/index.cfm?fa=round3) and my recent CAS *Forum* paper on loss reserving (http://www.casact.org/pubs/forum/06fforum/).

If you look at the material in these links, you will see another strong feature of R-graphics. For example, Figure 5 in the paper shows a matrix plot that illustrates how fitted loss development factors vary by insurer size. Statistical computing has placed a strong emphasis on data visualization in recent years and R includes many of these new tools.

I found the learning curve for R rather steep at first. I went about learning it by selecting a project (last year's COTOR Challenge) and forcing myself to do it with R. After doing that and some other predictive modeling projects, R replaced Excel as my personal "go to" computational software.

While the software itself is free, I have found it worthwhile to buy some books for reference. Here are three that will help you to get started.

- *R Reference Manual, Base Package* (both volumes) by the R Development Core Team. This is simply a print-out of the help menus arranged by subject and alphabetical order within subject. I found them a helpful reference for the names of commands. While looking for some commands, I frequently stumbled across others that proved to be very useful.
- *R-Graphics* by Paul Murrell. This book focuses on drawing neat graphs. It also has a good general introduction to R.
- *Modern Applied Statistics* with S by W. N. Venables and B. D. Ripley, Fourth Edition. This book shows how to use R for a wide variety of statistical methods. Don't let the "S" in the title fool you—R and S code are very similar. The fourth edition of this book addresses both software environments.

One additional comment—R code can be written on Notepad but there are other text editors specifically designed for R that make writing code easier. The one I use is called Tinn-R and you can download it for free from the Web Site www.sciviews.org/Tinn-R/.

I am not going to argue that R is the single best package for actuaries to use in their statistical analysis. It is important to keep current with other statistical software packages. However, I use R because there are many others in our profession who also use it. Many students are learning it and a recent CAS Limited Attendance Seminar on Predictive Modeling also used it. Because of its "open source" philosophy, I agree with the assessment currently offered in Wikipedia that R "has become a de facto standard among statisticians for the development of statistical software."

"Truth is Funnier than Fiction" and "The Importance of Models"

Here's a true story related to me by my father-in-law:

My father-in-law worked at a prestigious consulting pension benefits company for most of his career as a life actuary. He remembers an incident decades ago when computers were just making their debut in the workplace. A large client of his had given him all of their employees' information written on paper. He informed his client that his IT department was now going to need all the data for each employee put on separate computer punch-cards (remember those?) instead of paper.

Weeks passed and my father-in-law's firm was getting anxious. The data needed to be fed into their systems very soon, so that they could complete their pension evaluation. Finally, a large box arrived at the firm and was rushed down to the computer room. Stacks of punch-cards were pulled out and about to be fed into the card reader. However, the technicians noticed there were no holes in any of the punch-cards. Instead, they saw in small, neat print, each employee's information hand-written on the back of each card.

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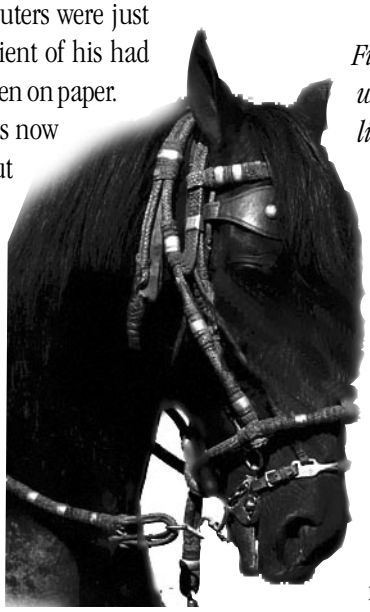


Finally, here's a classic joke from the math/physics world that reminds us of the importance and limitations of models:

A geneticist, a dietician, and a physicist are discussing how to produce a winning racehorse. The geneticist says, "Just by following good genetic principles, you simply breed from winners, select winning characteristics, and in a few generations you should have yourself a winning racehorse!" The dietician says, "No, you're wrong. I understand the importance of genetics, but to ensure a winner, we have to feed the horse the best nutrition and give it the appropriate exercise and training to ensure optimum performance." The physicist sadly shakes his head. "Look," he says, "let's imagine that the racehorse is a sphere…."

CAS International Calendar

Bookmark the online calendar at www.casact.org/calendar

April 1-4, 2007
XIth Accident Compensation Seminar
Grand Hyatt Melbourne
Melbourne
Australia

June 12-15, 2007
16th International AFIR Colloquium
Piperska Muren
Stockholm
Sweden

June 19-22, 2007
37th International ASTIN Colloquium
Lake Buena Vista, Florida, U.S.A.
Disney's Contemporary Resort
www.actuaries.org/ASTIN2007/

August 5-8, 2007
American Risk and Insurance Association
2007 Annual Meeting
Loews Le Concorde Hotel
Québec City, Québec
Canada

Actuarial Group Name Results

Well, it's official. After tallying the votes and crunching the numbers, the most popular choice for what to call a group of actuaries is (drum roll, please):

A Contingency!

A "Cohort" and a "Redundancy" were good runners-up.

Thank you all for your creative ideas and lobbying efforts. So now, let us please refer to ourselves as a "contingency" in the future.

Calls for Papers

2007 ASTIN Colloquium Call for Papers

The ASTIN 2007 Scientific Committee invites paper submissions to the 37th ASTIN Colloquium on the following topics:

Topic 1: Risk Management of an Insurance Enterprise: Risk models • Risk categorization and identification • Risk measures • Stochastic control • Risk transfer • Quantifying interdependencies among risks • Risk adjustment of business unit profitability • Asset risk including asset/liability dependencies • Credit risk including reinsurance recoverables • Accounting for risk • Risk in accounting

Topic 2: Pricing Risk: Risk margins • Pricing highly variable business • Pricing when probabilities are not known • Quantifying possible pricing error • Effects of pricing changes on business retention • Effects of company financial strength on pricing achievable

Topic 3: Liability Risk: Reserve models • Testing reserve models • Runoff risk • Estimation risk • Impact of reinsurance • Risk issues in discounting

Papers on topics other than those identified above will be considered by the ASTIN Scientific Committee and may be accepted at the Committee's discretion.

Authors should send their intentions to submit a paper to Mike Boa, CAS Director of Communications and Research, at mboa@casact.org, and include the paper topic and a brief abstract. The official languages of the Colloquium will be English and French. No simultaneous translations will be provided.

Papers should be submitted in their final form by January 31, 2007. Additional details on paper submissions can be found in the instructions for authors available at http://www.actuaries.org/ASTIN/Colloquia/Orlando/Instructions_for_Authors_EN.pdf

ARIA Call for Papers

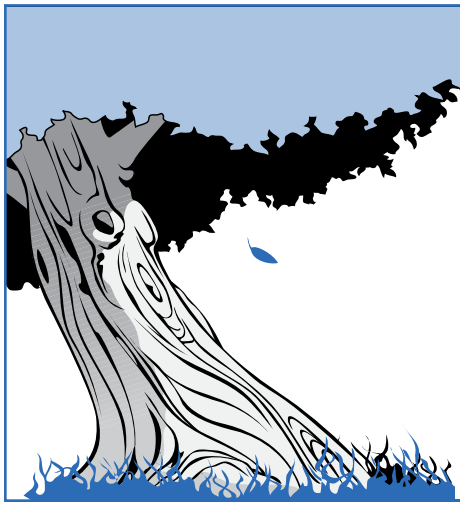
Authors are encouraged to submit a proposal to present research findings at the 2007 Annual Meeting of the American Risk and Insurance Association (ARIA), which will be held August 5-8, 2007 in Québec City, Canada. Papers on any risk or insurance related topic are welcome. Specific subject areas include, but are not limited to, finance, economics, risk management, insurance law or regulation, public policy, health care, international issues, and employee benefits.

Proposals from doctoral students are encouraged. The deadline for submission is February 16, 2007. This deadline will not be extended.

Proposals may be submitted to the ARIA Vice President and 2007 Program Chair:

Terri Vaughan
Drake University
College of Business and Public Administration
(515) 271-2830
Fax: (515) 271-4518
terri.vaughan@drake.edu

For full details see the complete program announcement at http://www.casact.org/research/2007ARIACallforPapers.pdf.



CAS Professional Education Calendar

Bookmark the online calendar at www.casact.org/calendar

November 12-15, 2006
CAS Annual Meeting
Hyatt Regency San Francisco
San Francisco, California

March 8-9, 2007
Seminar on Ratemaking
Hyatt Regency Atlanta
Atlanta, Georgia

March 28-30, 2007
ERM Symposium
Chicago Mariott Downtown - Magnificent Mile
Chicago, Illinois

April 10-11, 2007
Leadership Meeting
TBD
Chicago, Ilinois

May 7-8, 2007
Seminar on Reinsurance
Sheraton Society Hill Hotel
Philadelphia, Pennsylvania

June 17-20, 2007
CAS Spring Meeting
Disney's Contemporary Resort
Lake Buena Vista, Florida

Carlson Voted President-Elect; Myers to Become CAS President

Arlington, VA—Balloting for the CAS election closed on September 1, 2006 and tellers verified the election results. A total of 1,268 Fellows (44 percent) voted in this year's election. This compares to 1,116 Fellows, or 40 percent, for last year.

Christopher S. Carlson has been voted in as president-elect, receiving 971 votes. Carlson, a 1990 Fellow, currently serves on the CAS Board of Directors and the Long Range Planning Committee. His CAS governance experience also includes a term as the vice president-professional education from 2001 to 2004. Thomas G. Myers was elected president-elect in 2005. He will become CAS president at the close of the 2006 CAS Annual Meeting.

Brian Z. Brown, Charles A. Bryan, Mary D. Miller, and Joanne S. Spalla were elected to the CAS Board of Directors. The Board elected the following members to serve as vice presidents: Kenneth Quintilian, vice president-administration; Patricia A. Teufel, vice president-marketing and communications; and Andrew E. Kudera, vice president-professional education. The following members were re-elected by the Board: James K. Christie, vice president-admissions; Amy S. Bouska, vice president-international; Roger M. Hayne, vice president-research & development; and John J. Kollar, vice president-risk integration and ERM.

2006–2007 CAS President Thomas G. Myers

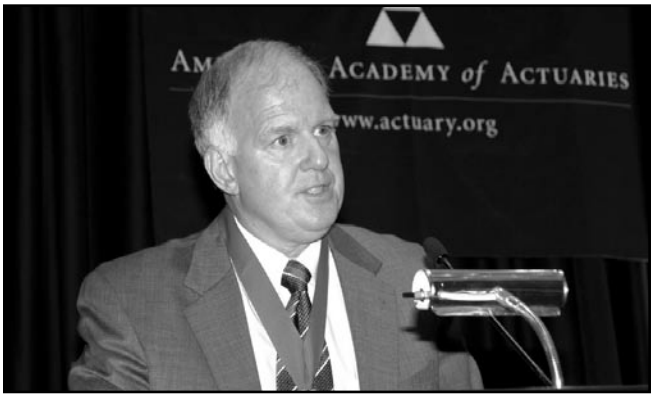
President-elect Christopher S. Carlson

The Actuarial Review congratulates the new president-elect, board members, and vice presidents. These Fellows will assume their positions at the close of the 2006 Annual Meeting this month in San Francisco.

Lehmann Becomes New Academy President; Other CAS Members Fill Academy Positions

Washington, D.C.—Steve Lehmann, former CAS president (1999), was installed on September 26 as the president of the American Academy of Actuaries at the organization's annual meeting. Lehmann, a principal and consulting actuary with Pinnacle Actuarial Resources, Inc., based in Bloomington, IL, now heads both the Academy's Executive Committee and Board of Directors. The board sets the strategic goals and priorities for the AAA, whose committees, task forces, and work groups regularly prepare testimony and provide objective information to Congress and senior federal policymakers; comment on proposed federal and state regulations; and work closely with the National Association of Insurance Commissioners as well as state officials on issues related to insurance, pensions, and other forms of risk financing.

Lehmann, who succeeds Peter Perkins as president, has more than 35 years of actuarial experience that encompasses development of pricing strategies, including coordination of underwriting and rating programs, credit score analysis, financial examinations, loss-reserve opinions, rate filings, residual market studies, and rate of return analysis. He has testified before regulatory and legislative bodies on a variety of insurance matters, including ratemaking, risk classification, and rate of return.



Steve Lehmann

Lehmann page 23

Fellows Approve Proposal to Revise CAS Governance Structure

Change Positions the Society as "Innovative and Forward-Looking"

ARLINGTON, Va.—In balloting conducted from August 1 to September 1, 2006, the Fellows of the Society approved changes to the CAS Constitution and Bylaws proposed by the CAS Board of Directors that will alter the governance of the Society.

The approved proposal allows the CAS to add up to three additional board members to the CAS Board of Directors, including non-actuaries, with the additional board members to be elected by the board. The three appointees will be in addition to the 12 elected members and three ex officio members (the president-elect, the president, and the immediate past president).

"I'm pleased that the Fellows approved this proposal," commented CAS President Paul Braithwaite, who will serve as chair of the board following his term as president. "The main reason for having a non-actuary on the CAS Board is to improve decision-making, and we're excited about the different perspective and knowledge that an outsider will bring to our deliberations." He continued, saying, "This change adopts what we consider to be a best practice in association governance and positions the CAS as innovative and forward-looking among actuarial organizations."

The proposal to create a new class of board member was developed by a special Governance Issues Task Force made up of present and former board members, including three past presidents of the CAS. The board created this task force to recommend the role of outside representation in the CAS governance process. The task force gathered input through many interviews and considered current trends in association governance in order to reach its conclusion that the CAS would benefit by having non-actuary board members. The Fellows enthusiastically endorsed the idea, with 74 percent voting in favor of the proposal. The CAS Constitution and Bylaws may be amended by an affirmative vote of 10 percent of the Fellows or two-thirds of the Fellows voting, whichever is greater.

The board began deliberating on how to fill the appointed seats during its September 14-15, 2006 meeting. The board plans to fill only two of the three positions initially, by appointing one non-actuary plus the American Academy of Actuaries-Vice President, Casualty. To facilitate the identification and recruitment of an appropriate non-actuary, the board formed a task force that will report back to

Governance page 21

Proposals to Expand Associates' Rights Fail

Next Major Initiative of Restructuring FCAS Education to be Put to the Membership for Feedback

ARLINGTON, Va.—Proposals that would allow Associates of the Casualty Actuarial Society to vote in CAS elections and serve as directors and officers failed to garner the necessary support of the Fellows, and were defeated in balloting conducted from August 1 to September 1, 2006.

The CAS Constitution and Bylaws may be amended by an affirmative vote of 10 percent of the Fellows or two-thirds of the Fellows voting, whichever is greater. Voting results on the 2006 election ballot's three initiatives related to the rights of Associates were:

Proposal	Yes	No
Give the unrestricted right to vote to members either upon attainment of Fellowship or five years after attainment of Associateship, whichever should occur first.	514 (41%)	727 (59%)
Permit Associates who have been members for at least five years to stand for election to the board of directors.	507 (41%)	74 (59%)
Allow Associates who have been members for at least five years to hold officer positions, with the exception of the president, president-elect, and vice president-admissions.	543 (43%)	709 (57%)

A total of 1,268 Fellows voted in this year's election, or 44 percent of the Fellows. This compares to 1,116 Fellows, or 40 percent, for last year.

"The outcome is disappointing in one respect, but encouraging in another," said Steve D'Arcy, Chairman of the CAS Board of Directors. "I believe there are many Associates who would be valuable contributors as directors and officers, and I regret that the Society is not able to draw upon those resources." D'Arcy continued, "On the other hand, I am encouraged that we were able to engage so many

ACAS Rights page 21

Leaving an Extraordinary Legacy, Rodney Kreps Retires from Guy Carpenter

By Steve White and Gary Venter

On his 64th birthday (or 100th base 8, depending on your perspective), Rodney Kreps gave his four years' retirement notice to Guy Carpenter. That's how long it would take a principal founder of Instrat to hand off all that he accomplished in his first 13 years at the company. After much planning, developing, hiring, and letting go, Rodney retired on his 68th birthday, August 29.

Rodney leaves behind a powerful legacy at Guy Carpenter. His work not only helped shape Instrat but also helped change how the reinsurance industry approaches risk management.

The Long Road to Reinsurance

Rodney grew up in Palo Alto, California, where his father was a professor at Stanford University. He pursued an academic career along with four of his five siblings. After earning a bachelor's degree at Stanford University and a Ph.D. at Princeton University, both in theoretical physics, he eventually became a tenured professor at the University of Toronto. However, soon after earning tenure, Rodney decided that maybe there was more to be had and left academia in 1975 at the age of 38.

"For years I focused single-mindedly on this goal but never stopped to think that I didn't belong there," said Rodney. "So after spending most of my life developing the left hemisphere of my brain, I began balancing myself by doing things that revolved around my intuitions and emotions. I learned to sing and dance. I lived on the side of a mountain and gained an appreciation of nature."

Rodney spent those years working with his hands in construction and other trades and eventually sought a position indoors. An acquaintance of his was in the actuarial program at Fireman's Fund and helped Rodney secure a spot in the program. "I thought I'd give it a try for a couple of years, and I found I loved the mix of science and intuition that you have to have to be a good actuary," he said. In 1989, Rodney joined the firm that would eventually be part of Guy Carpenter.

Leading the Reinsurance Industry

Rodney became a founding member of the Instrat group, which has grown from seven people when he started to nearly 200 today. One of Rodney's chief accomplishments during his 17 years with Instrat is MetaRisk, a pioneering analytical simulation tool that has spawned several similar products. He was also instrumental in the development of the next-generation platform, MetaRisk XMR, which is based on the principles of timeline simulation rather than collective risk modeling. "His ideas and vision are at the heart of MetaRisk XMR," said Ryan Ogaard, Instrat Global Practice Leader. "It's part of a powerful legacy; really a parting gift to us from a great thinker."

A quick rule-of-thumb calculation of price for a layer of property cat reinsurance is "expected loss plus one-third the standard deviation (from the cat loss distribution)." This well-known formula actually comes from Rodney's 1990 *Proceedings* paper, "Reinsurer Risk Loads from Marginal Surplus Requirements," a classic still used extensively in valuing reinsurance programs' risk margins. He extended this in the 1998 *Proceedings* to the Dorweiler Prize-winning paper "Investment-Equivalent Reinsurance Pricing."

Risk measurement and the contribution of lines of business to overall company risk has been a more recent concentration. Rodney's paper "Riskiness Leverage Models" won the 2005 Dorweiler Prize, and will soon be published by the CAS. There he introduced the concept of co-measures, which generalize the idea of covariance to a wide range of risk measures. This has been extended with coauthors Gary Venter and John Major to the paper "Marginal Decomposition of Risk Measures," which will be published in the November 2006 ASTIN Bulletin. The incremental marginal impact of a line on a company risk measure is the increase in total risk from the last little bit of the line's exposure. Marginal allocation assigns this increment to every exposure unit in the line. When these allocations add up over all exposure units and all lines to the company risk measure, that is a marginal decomposition of the risk measure. It turns out that some but not all co-measures produce marginal decompositions.

The details of loss modeling have always held Rodney's interest. One application here was the creation of a family of copulas that had no dependency for small events but increasing dependency for larger events, which seems to be the way some lines of insurance interact. This was published in "A Partially Comonotonic

Kreps page 20

Kreps From page 19

Algorithm for Loss Generation." His paper "Parameter Uncertainty in (Log) Normal Distributions" from the 1997 *Proceedings* addressed the accuracy of the inverse of the information matrix (as discussed in the Part 4 exam syllabus) as a way to estimate the possible parameter error in fitting from small samples. He concluded that the covariance matrix was not too bad, but the distribution was closer to lognormal than normal.

Rodney was working full-force all the way to retirement. His latest paper on the subject of timeline simulation models takes him to the frontiers of enterprise risk modeling—and it was submitted for CAS publication on his last day of work.

The Next 17 Years

Rodney retires from Guy Carpenter as Instrat is maturing into one of the main forces reshaping the reinsurance business. "This long lead time before retirement has given me the chance to see how things will be after I leave, and I'm predicting a great future," he said. "There are so many great things going on here that I almost hate to go."

Guy Carpenter will definitely miss Rodney. "He has an unsurpassed ability to apply analytics to real-world problems," said Ryan. "He's also just plain fun to work with; he thinks way outside of the box and has a great sense of humor."

Rodney may return to Guy Carpenter at some point as a consultant, but he's been careful not to make any promises. He may write a book on management or become an adjunct professor. But for the next six months at least, he'll slow down his life, go on retreats, visit India, and let his thoughts percolate.

"I think of my life in 17-year increments, and I'm now starting the fifth and probably last cycle," he said. "I want to take the time to let go of what has been. At one point, I had no job and no home and about $3,500. There was nothing pulling me anywhere, and my life turned a right angle when I met a Sufi teacher. I want to return to that point and be receptive to what's next." AR

New Fellow by Mutual Recognition Agreements

- **Weng Kah (Jessica) Leong, FCAS, May 2006—Fellow, Institute of Actuaries of Australia, Consulting Actuary, Milliman, Inc.**

Joint Risk Management Section Encourages CAS Member Involvement

By Becky A. Yeager, Communications Coordinator

Sponsored by the CAS and SOA, the Joint Risk Management Section works to advance the actuarial profession by assisting members of the Section with educational, research, networking, and other specialized needs that arise in the risk management area of actuarial practice.

Many actuaries have the skills and knowledge to be experts in the field of risk management, but action must be taken to gain this recognition. Therefore the Section urges all members of the CAS to actively participate in the world of Enterprise Risk Management (ERM) and become members of the Joint Section.

"CAS members need to become actively involved today," said Don Mango, CAS Board Liaison to the Section. "The key words are 'actively' and 'today.' They cannot sit back and wait for this to happen to the profession," Mango stated.

CAS members can get involved with the Joint Risk Management Section in many ways. Members can volunteer for a committee sponsored by the Joint Section, become a resource and speaker on ERM for the profession, and design professional and beginning education courses on ERM topics. Most importantly, CAS members can continue to educate themselves and their companies about risk management.

While casualty actuaries are adept at hazard risk, opportunities exist in dealing with uncertainty in other areas of risk. The Joint Risk Management Section helps CAS members take advantage of new opportunities in the job market by integrating the knowledge of actuaries into other fields of practices. The joint sponsorship of this Section also helps to bring the resources and knowledge of both the CAS and SOA into the evolving world of ERM. The CAS and SOA have already been working on several initiatives including risk tolerances, risk metrics, operational risk, and the ERM Symposium.

All members of the CAS who are interested in risk management are encouraged to join the Joint Risk Management Section and to attend the Enterprise Risk Management Symposium in March 2007.

For more information about the ERM Symposium and other upcoming events, visit the CAS Web Site at www.casact.org. AR

Expand Your Health Care Knowledge—Join the SOA Health Section

By Leon Gottlieb, Member, CAS Committee on Health Care Issues

The CAS Committee on Health Care Issues (CHCI) has been working to develop a partnership with the Society of Actuaries to provide educational and research opportunities to CAS members and students who practice in areas affected by the cost or delivery of health care. As a result of these efforts, the committee is pleased to inform CAS members of the opportunity to become an affiliate member of the SOA Health Section.

The Society of Actuaries has an active Health Section with more than 3,500 members. While the SOA's focus may differ from that of CAS members, there are many common issues facing both memberships. The SOA has provided a way for CAS members to benefit from and participate in its educational and research activities. For the 2006 fee of $30, CAS members can have affiliate status in the SOA's Health Section. Benefits include:

- Regular publications, including the bi-monthly health e-news to keep up on current happenings in the health care industry, and the Health Section newsletter to read timely articles contributed by fellow members of the health care industry (three per year);
- Discounts at SOA-sponsored professional education events covering today's most relevant and pressing health care challenges;
- Members-only networking opportunities at various SOA-sponsored events;
- Volunteer opportunities on subcommittees of the Health Section that provide a chance to work with other actuaries in the health care field as well as opportunities to influence the direction of the Health Section.

Examples of areas of interest that have been the subject of research and/or educational opportunities include:

- The emergence of disease management in treating chronic disease;
- The effect of pandemics on the health care and health insurance industries;
- Use of predictive modeling for health care expenditures and usage;
- Medical cost trends;
- New health care technologies (including new medical procedures and new drugs);
- Disability income insurance experience studies;
- Changes in medical treatment patterns for disease.

Although affiliate members are not eligible for election to the Section council, the CAS's CHCI chairperson, Theresa Bourdon, has become an ex officio member of the Council. The CHCI will be working closely with the SOA's Health Section. Robert Bachler, a member of both Societies, was instrumental in making this opportunity possible.

To apply to the section, visit: http://sections.soa.org/SOAMembershipForm.pdf.

Governance From page 18

the board in March 2007. This should enable appointment of the non-actuary board member by the May 2007 board meeting.

Along with the changes to the make-up of the board, the Fellows approved the proposal to officially designate the CAS Executive Director as a member of the CAS Executive Council. Having already attended every executive council meeting since being named executive director in 2001, Cynthia Ziegler participated in her first meeting as a voting member of the Council on October 10, 2006.

"Our executive director has always been an active participant in executive council meetings, and we've come to rely on her expertise in association management best practices," commented Braithwaite. "We are glad that the Fellows have endorsed the board's recommendation."

The revised Constitution and Bylaws became effective on September 5, 2006. The documents are available through the CAS Web Site in the "About CAS" section under "Policies and Procedures." They will also be included in the 2007 CAS *Yearbook/Proceedings.*

ACAS Rights From page 18

Fellows in this discussion as reflected by the voter turn-out, which showed a 10 percent increase from 2005 to 2006."

The CAS Board of Directors will soon be seeking member input on another important issue facing the Society—FCAS education—according to discussions that took place during the September 14-15, 2006 board meeting. During the meeting, the board agreed to expose, via a White Paper, a proposed strategy for FCAS education and to seek input on the strategy from key stakeholders before implementing any changes. In addition, the board agreed to defer the proposal to discontinue offering the ACAS credential pending resolution of FCAS education issues. When released in the late fall, the White Paper and a survey feedback form will be available through the CAS Web Site.

Comparing Insurers and Lenders

The price of risk in insurance should be in harmony with the price in the broader financial markets. In modern finance, this harmonization occurs through *comparability* of financial market products. Perfect (total) comparability is known as *replication* and underlies no-arbitrage pricing formulas for derivatives in complete markets. Incomplete markets are characterized by the inability to replicate, so comparability (partial replication) is essential. Comparables are used in many valuation exercises throughout our economy, including hedge funds, private equity, fine arts, and real estate. Valuation with comparables is based on matching as closely as possible the scenario cash flows of the net risk positions.

In seeking comparables for insurance liability portfolios, many researchers have first turned to CAPM. Table 1 compares the net risk position of the hypothesized CAPM fully diversified investor to an insurer's liability portfolio.

Full Diversified CAPM Member	Insurer Liability Portfolio
Liquid market	Illiquid market
Long and short positions	Long positions only
Active trading	Buy-and-hold
Short-time horizon	Long-time horizon
Symmetric return profile	Skewed return profile
Significant upside potential	Limited upside potential

Table 1

CAPM comparability appears low. The alternative we will consider is *specialized lenders*, those operating outside the mainstream personal and commercial loan sectors.

Specialized Lender Comparability

While lacking a generally accepted definition, "specialized" means lending: for highly leveraged borrowers to fund acquisitions, restructurings, or leveraged buyouts; in support of large credit lines; for large scale project finance; or in technical industries (e.g., film finance, agriculture, or precious metals).

One key differentiator between mainstream and specialized lending is the ability to package and securitize the loan obligations. As a result of securitization, mainstream lenders maintain very small net risk positions (similar to our CAPM investor). Specialized lending portfolios cannot be securitized, so the lender retains a net long position and exposes its own risk capital to loss. Table 2 compares specialized lenders and insurers:

Specialized Lender	Insurer Liability Portfolio
Illiquid market	Illiquid market
Long positions only	Long positions only
Buy-and-hold	Buy-and-hold
Long time horizon	Long time horizon
Skewed return profile	Skewed return profile
Limited upside potential	Limited upside potential

Table 2

Specialized lenders have a much more comparable net risk profile.

Insurers as Lenders?

It seems specialized lenders are a *very close* comparable to insurers. As a thought experiment, consider *insurers* as *specialized lenders*:

- The insurer lends each policyholder the policy limit—call it the "insurance loan;"
- The loan funds are held in trust by the insurer, so the insurer does not face up-front liquidity constraints (like a true lender);
- Insurers (like lenders) do however face aggregate capacity constraints—limitations on how many policies (loans) they can issue;
- If the policyholder goes claim-free, there is "full loan repayment;"
- Any claim represents some degree of default;
- The insurer expects significant default losses for the portfolio in total;
- But it also collects significant market default loss compensation—the expected loss component of premiums;
- As long as there is potential for the policyholder to report a claim on a policy, the loan is still "outstanding."

Brainstorms page 24

25 Years Ago in *The Actuarial Review*

Nice (Research) Work If You Can Get It

By Walter C. Wright

Following is an extract from Norman Bennett's "Random Sampler" of November 1981. His humor continues to amuse.

. . .This past summer was interesting in personal actuarial matters. I was fortunate to meet and talk at length with a large number of actuaries—most of them on their home turfs. The range of turfs was national—vertically from Palczynski to Granoff and laterally from Schulman to Golz to Ford with a number of intermediate stops.

They were productive and interesting encounters in all but one respect. Aware of the incipient criticism of my not being factual in writing, I tried to pick up something substantially actuarial. I had heard from Jane Taylor that one Vilfredo Pareto had a hot new distribution item that no actuary should be without. So everywhere I went, I inquired.

I might have been carrying the plague. Save for a very few, my actuarial contacts were curiously reticent. Dave Skurnick said Fredo had been rejected out of hand on the West Coast as the protégé of a pushy East Coast crowd. Jim Kreuzer, on the other hand, thought the rejection had something to do with the cost of the extra parameters under the Reagan economic program. A prominent consultant pooh-poohed that notion. He would readily supply as many or as few parameters as the client thought he could afford. My trusted associate, Dave Grady, was kind but blunt—it would simply take too long to explain it to me. Everyone else professed not to know what I was talking about.

I thus regret my inability to report to you of Signor Pareto's accomplishments. Sour grapes, perhaps, but it just doesn't sound like much fun anyhow. Yet somewhere I sense there are actuaries who must be having fun. The New York Insurance Department reported recently in its starchy fashion that a company of the American International Group had reduced its professional liability rates for sex therapists by 30%. Old Pareto and Poisson would be aghast. A practical and serious subject like the number of Prussians kicked to death by horses was one thing. A practical and sensual subject like the number of Americans brought down by libidinous liability would not have been dreamt a subject for pure mathematics. Yet, I repeat. Some actuaries today must be having fun. But who? Who at AIG is enjoying the research and fitting the trends? With minus 30 percent indicated, someone knows something. My calls over there go unreturned.

Lehmann From page 17

Lehmann has written several professional papers in the casualty actuarial field and has leadership experience within actuarial organizations. In addition to serving as the CAS president, Lehmann served as vice president of the Academy's Casualty Practice Council from 2001 to 2002. During both terms he served on the Academy's Board of Directors. He is also a member of the Canadian Institute of Actuaries and the Midwestern Actuarial Forum. Lehmann is a graduate of the University of Illinois.

Robert Miccolis, FCAS, a director with Deloitte Consulting in Philadelphia, is the new vice president of the Academy's Casualty Practice Council, which provides objective technical expertise to policymakers and regulators on major property-casualty issues, including medical malpractice, terrorism risk, and asbestos litigation.

Chuck Emma, FCAS, was elected and installed on September 26 as a director of the AAA. As a member of the Academy's Board of Directors, Emma will help set the strategic goals and priorities for the organization. Emma is a principal and consultant with Pinnacle Actuarial Resources in Chicago. He has 22 years of actuarial experience, mainly focusing on loss reserving for property/casualty companies and self-insured organizations, and regulatory support. Emma frequently speaks about dynamical financial analysis, loss reserving, and risk-based capital. He also has authored a prize-winning paper on dynamic financial analysis. Emma currently serves as the chairperson of the Financial Soundness and Risk Management Committee of the Academy's Casualty Practice Council. He is a graduate of the University of Notre Dame.

Christopher Carlson, FCAS, was also installed as new Academy special director, based on his appointment as president-elect of the CAS.

Brainstorms From page 22

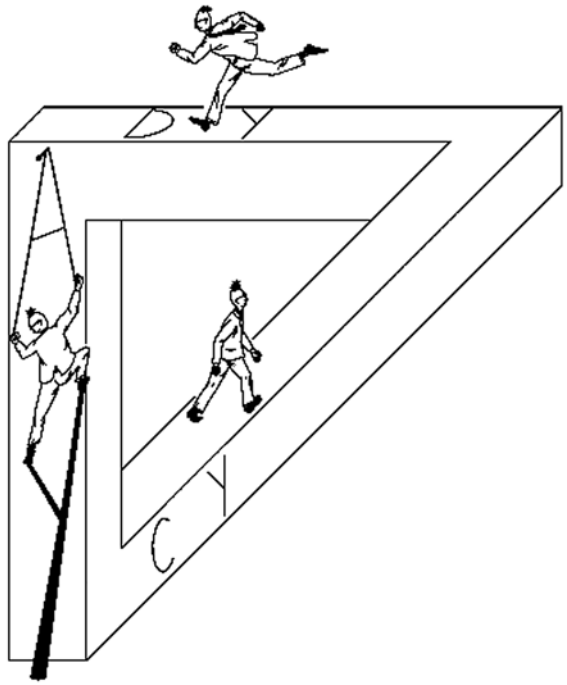
For price comparison, the insurance loan *principal* is the policy limit, which for some policy types is actually undefined. The insurance loan *term* extends until the last reporting date for claims—what is known as the sunset date in reinsurance. Again, there may be no such date for some policy types. Risk reduction to the insurer over time would be reflected not in a reduced *amount* (like some required capital calculations), but with a *reduced likelihood of default* on the entire principal. This is the opposite of the default risk profile faced by most lenders, where default risk increases with loan term. Remember, to compare default loss rates between true loans and insurance loans, one would use the ratio of losses to total policy limits outstanding, not premium.

Risk reduction to the insurer over time would be reflected not in a reduced amount (like some required capital calculations), but with a reduced likelihood of default on the entire principal. This is the opposite of the default risk profile faced by most lenders, where default risk increases with loan term.

If this thought experiment proves fruitful, much additional work lies ahead. Loan rates include a credit spread (additional yield beyond default-free). The decomposition of the credit spread is the subject of intensive research, and no consensus yet exists. It appears the spread may be composed of pieces for taxes, liquidity premium, and true risk premium. If such components can be reliably estimated, meaningful cross-benchmarking of the "price of risk" may be possible. Such price comparisons may highlight a route towards a broader notion of "market price of risk." Fairness of insurance pricing could be assessed not just within the insurance market, but also across a broader slice of the financial market. AR

Chance Encounters

By Jeff Adams



Update on the Actuarial Foundation

CAS Members Helping Consumers

By Dave Cummings, Trustee of the Actuarial Foundation

Thanks to the help of several CAS members, the Actuarial Foundation has recently produced two new educational materials highlighting property insurance issues. Through these initiatives, the Foundation is helping to educate the public and raise the visibility of our profession in our communities.

For many years, the Federal Alliance for Safe Homes (FLASH) has educated consumers and builders about ways to improve home construction to mitigate losses in natural disasters. However, FLASH has previously provided little information to consumers about insurance issues. Through a partnership with the Actuarial Foundation, FLASH has now produced a new consumer booklet, *If Disaster Strikes, Will You Be Covered? A Homeowner's Insurance Guide to Natural Disasters*. The booklet describes general issues regarding homeowners insurance, and identifies key peril-specific issues to consider. The Consumer Education Committee of the Actuarial Foundation assembled a team of actuaries to write the background information for the booklet, and provided funding for printing and distribution. FLASH developed the final booklet and began distributing it to consumers through its network of sponsoring organizations.

The Actuarial Foundation partnered with Scholastic—the world's largest publisher of children's books and a leading educational publisher—to develop a unique math-oriented curriculum geared toward middle school children. The curriculum, called "Shake, Rattle, & Roll," includes four ready-made lessons and activities for teachers to use in their classrooms. A team of actuaries worked together with Scholastic to develop these lessons that demonstrate applications of math and probability in disaster insurance. In October, Scholastic distributed the curriculum packets to more than 40,000 teachers across the U.S., with the potential to reach more than one million students.

These programs help the Foundation to accomplish its mission to develop, fund, and execute education and research programs that serve the public by harnessing the talents of actuaries. The contributions of time and money from actuaries across the profession make these activities possible. To learn more about these projects or to donate online, please visit www.actuarialfoundation.org.

Wynn Kent Public Communication Award

The Wynn Kent Public Communication Award is given out annually to recognize a member of the actuarial profession who has contributed to the public awareness of the value of actuarial science in meeting the financial security of society in the fields of life, health, casualty, pension, and other related areas. The intent of this award is to encourage actuaries to engage in activities that highlight the actuarial profession's role in financial security issues benefiting the public.

To nominate someone for a Wynn Kent Award visit http://www.actuarialfoundation.org/research_edu/prize_award.htm#kent. Deadline: 1/15/07.

Exposure Draft, What Exposure Draft?

Editor's Note: This article is part of a series written by members of the CAS Committee on Professionalism Education (COPE) and the Actuarial Board of Counseling and Discipline (ABCD). 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.

As we go to publication, there are three documents in exposure draft that have some degree of relevance to nearly all practicing CAS members. Specifically, the American Academy of Actuaries has issued an exposure draft related to the Qualification Standards for Actuaries Issuing Statements of Actuarial Opinion in the United States, and the Actuarial Standards Board has issued exposure drafts for a new Actuarial Standard of Practice (ASOP) related to Property/Casualty Unpaid Claim and Claim Adjustment Expense Estimates and revisions to the Statement of Principles (SOP) Regarding Property and Casualty Loss and Loss Adjustment Expense Reserves. This article is meant to provide a self-test for your knowledge of the provisions included in these important documents. Let's see how you do. Answers follow at the end of the test!

Qualification Standards

1. The proposed changes to this document expand the continuing education requirements from 24 hours over a two-year period to:
   a) 15 hours per year
   b) 20 hours per year
   c) 30 hours per year
   d) 40 hours per year

2. The actuary should be prepared to provide evidence of compliance with the qualification standards. Which of the following statements regarding record keeping is false?
   a) The records should contain the date of the continuing education.
   b) The records should contain the credit hours obtained.
   c) The records should contain a description of the subject matter.
   d) The records need to be maintained for only two years.

3. Under the proposed standard, an actuary signing a statement of actuarial opinion for an NAIC P&C Annual Statement is required to complete 15 credit hours per calendar year of continuing education that is directly relevant to that opinion. How many of these hours must be obtained through interaction with actuaries or other professionals?
   a) 3 hours
   b) 6 hours
   c) 10 hours
   d) 15 hours

4. As opposed to the current version of the Qualification Standards, which applies only to the prescribed statement of actuarial opinion, the proposed standards apply to all opinions expressed by the actuary in the course of performing actuarial services that are intended to be relied upon by the addressee. Which of the following statements regarding the proposed standards is false as related to statements of actuarial opinion (SAO) under the proposed standards?
   a) Unless so designated by the actuary, internal communications within the company are not SAOs.
   b) A preliminary draft of an actuarial opinion that has not been provided to an actuary's client is not an SAO.
   c) A statement that contains data and/or other information is an SAO even if it does not contain actuarial advice.
   d) The fact that an actuarial opinion is conveyed orally is not, in and of itself, evidence that the opinion is not an SAO.

GO ON TO THE NEXT PAGE.

5. To satisfy the General Qualification Standard, actuaries are required to complete and document at least 30 hours each calendar year of continuing education that is relevant to the subject of the Statements of Actuarial opinion that they issue. The 30-hour requirement must be met before an actuary can issue a statement of actuarial opinion. Which of the following statements is false?

a) Continuing education is "relevant" if it broadens or deepens the actuary's understanding of one or more aspects of the work an actuary does.
b) Continuing education is "relevant" if the material expands an actuary's knowledge of practice in related disciplines that bear directly on an actuary's work.
c) Continuing education is "relevant" if it facilitates an actuary's entry into a new area of practice.
d) Continuing education is "relevant" if, and only if, the course material is pre-approved by the Academy of Actuaries.

ASOP Related to P/C Unpaid and Claim Adjustment Expense Estimates

6. This document provides guidance to actuaries when estimating unpaid claim and claim adjustment expenses for property/casualty coverages. Which of the following statements is false?

a) This standard is applicable when developing unpaid claim liabilities for events that have already occurred as of a specific date.
b) This standard is not applicable when estimating unpaid claim liabilities for government entities.
c) This standard is not applicable when estimating losses in a ratemaking context.
d) This standard is not applicable when estimating claim liability for losses that have not occurred for policies in force.
e) This standard is not applicable when estimating liabilities for renewal of policies currently in force.

7. Which of the following communications is covered under the proposed standard?

a) communications of significant actuarial findings in e-mail
b) communications that are issued strictly orally
c) informal communications
d) all of the above

8. This ASOP introduces a new term labeled "Actuarial Central Estimate." What does the term "Actuarial Central Estimate" represent?

a) The term refers to an estimate that represents a mean excluding remote or speculative outcomes that, in the actuary's professional judgment, is neither optimistic nor pessimistic.
b) The term refers to an estimate that may or may not be the result of the use of probability distribution or a statistical analysis.
c) The term is intended to clarify the concept rather than assign a precise statistical measure, as commonly used actuarial methods typically do not result in a statistical mean.
d) all of the above

9. Which of the following are false?

a) Unless one particular method is clearly superior the actuary should use multiple applicable methods in estimating unpaid claims.
b) An actuary must label the estimate that he/she is providing as an actuarial central estimate in all correspondence delivered as part of unpaid claim estimates.
c) If a conflict exists between this standard and applicable regulation, compliance with applicable regulation is considered to be a deviation from this standard and must be documented and justified to the ABCD.
d) The decision to use a particular method that has been used in the past is not in and of itself sufficient in meeting this standard.

SOP Regarding Property and Casualty Loss and Loss Adjustment Expense Reserves

10. This statement was developed to replace the 1988 Principles because:

a) The 1988 Principles were created before any Standards of Practice were circulated by the Actuarial Standards Board.
b) The 1988 Principles contained instances of "standards type" concepts and language.
c) The uncertainty inherent in the estimation of loss reserves warranted more emphasis.
d) all of the above

STOP.

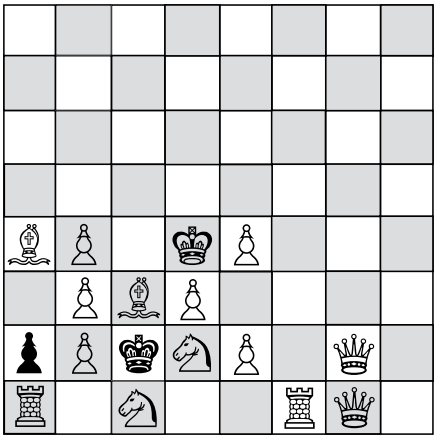
ANSWERS:

Question 1: Answer – c
Question 2: Answer – d (at least 4 years)
Question 3: Answer – b
Question 4: Answer – c
Question 5: Answer – d
Question 6: Answer – b (is applicable)
Question 7: Answer – a (b and c are excluded)
Question 8: Answer – d
Question 9: Answer – b and c are false
Question 10: Answer – d

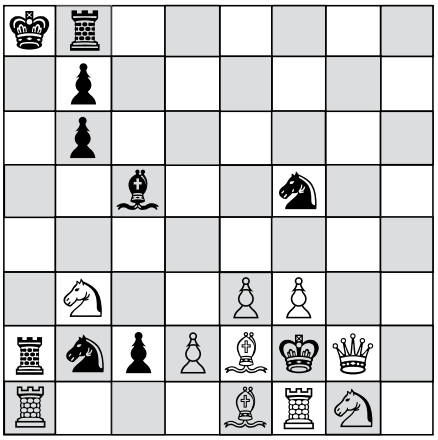
JOHN P. ROBERTSON

Mate in Three

Tom Struppeck has crafted two fine chess puzzles for the *AR*. In the first, White has badly outplayed Black, and it is now White's move. How does White mate in three moves? In the second, Black gets its revenge. How does Black move to ensure a mate in three?



Problem 1 - White to mate in three



Problem 2 - Black to mate in three

Solution to Win $1 Billion, Probably

Apparently this was more of a challenge than we had thought—there were only two solvers. In the problem, Edward was to pick a fraction of his wealth-at-the-moment that would be bet on each flip of a highly weighted coin, one that had only a one in a thousand chance of coming up heads. His friend Kelly would pay 1001 to 1 for heads, although he would keep Edward's bet when tails came up. Edward also had to pick the number of flips in advance. His wealth started at $1. The puzzlement was to find a fraction and a number of flips so that at the end he had at least a 99.9999% probability of having at least $1,000,000,000.

Tom Struppeck and Dave Oakden solved this Puzzlement using the Normal approximation to the Binomial distribution. The final wealth is dependent on the total number of heads and tails flipped but not the order in which the heads and tails occur. Tom concluded that Edward could bet 0.000057509% of his wealth 125,312,615,700 times in a row. Tom notes that if the betting had begun during the reign of Roman Emperor Tiberius and two flips were made every second, it would finish about now. Dave suggested betting the fraction $1/999.37^2$ about 163.26 billion times.

Jon Evans, creator of the problem, adds that a similar answer is given by mathematician John L. Kelly Jr.'s "Kelly criterion" (no relation to the Kelly in this Puzzlement) for proportional betting where the fraction bet optimizes the expected logarithm of the wealth outcome for each bet. The Kelly criterion recommends betting 0.0001% of Edward's wealth and the Normal approximation says 162,802,464,476 times suffices. A great book about the Kelly criterion and how it was effectively utilized for blackjack card counting and hedge fund management by mathematician Edward O. Thorp (no relation to bettor Edward in this Puzzlement) is *Fortune's Formula: The Untold Story of the Scientific Betting System That Beat the Casinos and Wall Street*, by William Poundstone (Hill and Wang, 2005). AR

In Memoriam

Paul D. Wilbert (ACAS, 2003)
July 20, 2006

James C. Hickman (ACAS, 1959)
September 10, 2006

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