The Actuarial Review

Volume 31, No. 4
November 2004

Published by the
Casualty Actuarial Society

From the President

Are You Qualified?

by Mary Frances Miller

If you practice in the United States,or if your client does business in the U.S., proposed changes to the AAA qualification standards may affect you (www.actuary.org/pdf/prof/qualification_may04.pdf). If you do not currently sign prescribed statements of actuarial opinion (PSAO), the only written qualification standard that applies today is Precept 2 of the Code of Conduct, which requires you to perform actuarial services only when qualified to do so. Determining whether you are qualified is left to your own judgment. The proposed general qualification standard applies to an expanded category of actuarial services, and it does not leave the decision to your own "look in the mirror" test.

The new qualification standard, if adopted by the AAA Board, will apply to all Statements of Actuarial Opinion (SAO) that go to anyone other than your immediate employer. Membership in the CAS obliges you to comply with the AAA qualification standards for U.S. practice, even if you do not belong to the Academy. First, what constitutes an SAO? According to the new standard:

"...a Statement of Actuarial Opinion is an opinion expressed by an actuary based upon actuarial considerations and

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Braithwaite Wins President-Elect; D'Arcy to Become CAS President

ARLINGTON, Va.—CAS members elected **Paul Braithwaite** as CAS President-Elect for 2005. **Stephen P. D'Arcy** will succeed **Mary Frances Miller** as CAS president, who in turn will become chairperson of the 2005 CAS Board of Directors. Braithwaite will take on his new position at the close of the 2004 Annual Meeting in Montréal.

Stephen P. D'Arcy

Paul Braithwaite

Balloting for the CAS election closed on September 2, 2004, and tellers verified the election results. A total of 1,167 Fellows voted in this year's election, or 44.3 percent of the Fellows. This compares to 50.8 percent of the Fellows voting in the 2003 election, and 49.1 percent of the Fellows voting in

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Important Changes to Exams 1-4 Due in '05

by Dana R. Frantz, CAS Candidate Liaison Committee

Starting in 2005, significant changes to Exams 1-4 will be effective. These are the changes to preliminary education that the CAS approved earlier this year. The biggest difference is the movement of some topics off the exams to a Validation by Educational Experience (VEE) process. The new structure will consist of three topics requiring VEE

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Board Discussion on Classes of Membership Continues

NIAGARA FALLS, Ont., Canada—The question of how many classes of membership are appropriate for the CAS was again the focus of much discussion and debate when the CAS Board of Directors met here on September 9-10, 2004.

Following up on the discussion held during the May 2004 board meeting, **Shelly Rosenberg,** chairperson of the Task Force on Classes of Membership, attended the meeting to present an updated report.

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Inside This Issue:

In My Opinion

Some Things to Think About

by Arthur J. Schwartz

It's election time and holiday time, and the telemarketers seem to be relentless this season in calling up and conducting opinion polls. A recent telephone poll began with the usual queries: which candidates I liked, my position on Iraq and global warming—which was all fair game. Then they wanted personal information on me! The type of job I held (the interviewer was a bit flummoxed by "actuary"), my age, income, and degrees. Since I could see where the conversation was headed, I decided to have a little fun with her. To be an actuary, I told her, I needed to study law and statistics. So I told her I studied law and human rights in Havana, and then I did my post-graduate thesis on statistics by studying with the Pirahã tribe in Brazil (whose only words for numbers are one, two, and many).

"...Perhaps the CAS needs an ambassador, a prime minister, or a chief poobah?"

Speaking of elections and polls, I recently dreamed that I was in the foreign country of Galbina at election time. In my dream, I'm in the ballot box. The following choices are presented for the office of president: Joe Galbina, Mary Galbina (his wife), Tommy Galbina (their seven-month-old infant), and Spottie Galbina (their seven-month-old Labrador retriever). Before making my choice, I consider how fortunate that in Galbina, I actually have a choice of candidates for president…[1]

Does the CAS Need an Ambassador or Two or Three?

In the past few years, the CAS, much to its credit, has undertaken sweeping changes to its election procedures. These changes grew out of two task forces, the first headed by **John Purple**[2] in 2000, and the second headed by **Susan Witcraft**[3] in 2002. All members of those task forces should take a bow! The CAS election process is more open to anyone who wants to run than ever before. This assures the Society of passionate, committed leaders serving at the highest levels. The opportunity for CAS members to keep informed of current events at the board level and to submit their own comments, if interested, has been improved with the publishing of the board's minutes and agenda for its meetings on our Web site.

There remains one area that might possibly need a closer look. The CAS has annually "elected" someone to the president-elect office. There's a touchy word, "elected." Let's say that we've been presented with a single candidate, most of the time, and we have dutifully flipped the levers in the ballot box for our "chosen one." Can there be a "chosen two?" Or a "chosen three?"

After making some informal inquiries about why we have had only one candidate to "choose" from, the reason comes down to time. The president spends about half of a normal work year on CAS activities. That level of commitment makes the office generally suitable only for those who are retired, or about to be, or for those

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1 In my dream, I pull the lever to vote for the dog. He may not be too bright, but he knows how to enjoy his time off, and he's tough on those pesky squirrels.
2 Members were **Regina Berens, Chuck Bryan, Bill Carpenter, Ira Kaplan,** and John Purple.
3 Members were **Jo Ellen Cockley, Ann M. Conway, Janet L. Fagan, C.K. "Stan" Khury, Howard C. Mahler, Michael J. Miller, Deborah M. Rosenberg,** and Susan E. Witcraft.

The Actuarial Review is the quarterly newsletter of the Casualty Actuarial Society.

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The Actuarial Review (ISSN 10465081) is published four times each year by the Casualty Actuarial Society, 1100 North Glebe Road, Suite 600, Arlington, Virginia, 22201-4798. Telephone: (703) 276-3100; Fax: (703) 276-3108; E-mail: office@casact.org. Third class postage is paid at Gaithersburg, Maryland.

The amount of dues applied toward each subscription of *The Actuarial Review* is $10. Subscriptions to nonmembers are $10 per year. Postmaster: Send address changes to: *The Actuarial Review*, 1100 North Glebe Road, Suite 600, Arlington, Virginia, 22201-4798.

Of Beads and Beans: 2005 Seminar on Ratemaking to be Held in New Orleans

by James B. Rowland, Chair, Ratemaking Seminar Committee

The New Orleans Marriott will host the 2005 CAS Seminar on Ratemaking March 10 and 11 (note: the dates and location printed in the 2004 CAS *Yearbook* have changed). The 2005 event will feature a general session on the Underwriting Cycle and the actuary's role in it. Over 50 concurrent sessions are planned to provide a wide array of educational opportunities to actuaries and other insurance professionals. Sessions will be offered in the following tracks: Introductory, Data & Technology, Workers Compensation, Commercial Lines, Personal Lines, Reinsurance, Risk & Capital Management, and Specialty Topics. Additionally, papers from the Ratemaking and Data Call Paper programs will be presented and discussed.

After learning new and improved ways of "counting beans" during the day, perfect your skills at "counting beads" at night! The New Orleans Marriott is located in the heart of downtown amidst a myriad of attractions and activities to enjoy. Plan now to attend! Look for the brochure and registration information in the mail and online in the near future. ■

Editors' Notes

The staff of *The Actuarial Review* thanks you readers who have contributed names and articles for our upcoming parody issue. (Names withheld to protect the not-so-innocent. We know who you are.) To date we have received enough material to fill about one page. We need more, *much* more! We need articles on the following topics (or on topics we haven't dreamed up!):

CAS Eliminates Exams: "Those other countries can't *all* be wrong!" says CAS President-Elect

Study Reveals Differences in Rate Filings Prepared by Male/Female Actuaries

American Academy Proposes Social Security Solutions (Encouraging Smoking Tops the List)

Results in From First CAS Sex Survey (Surprising Frequency and Severity Statistics)

CAS Rejects Mutual Recognition Application from Italian Bookmakers, CAS Board Accused of Racism

Nonactuarial Pursuits: CAS Members Beat Their Spouses

We also need parody versions of all the regular columns—"Random Sampler," "BrainDead," and the rest. Please send us articles and opinion pieces that you've always wanted to see in print!

Speaking of "print," Rich Newell asked me why we continue to snail-mail *The Actuarial Review* to all of you. Good question… And perhaps the time has come to spare some trees and publish online only. We last considered this almost ten years ago, when the CAS Web site was in its infancy. We decided that our technology was not good enough and too many readers still didn't have convenient access to the Internet. Nowadays, probably every one of you has Internet access during at least part of the day, certainly often enough and long enough to read or download *The Actuarial Review*. We can alert you via e-mail when each new issue becomes available. The 2004 *AR* budget is $36,400; the actual cost is "only" about $34,000. That's roughly $10 per member that could otherwise go towards higher salaries for the CAS staff or fancier appetizers at CAS seminars. If you are unwilling or unable to download *AR* from the CAS Web Site every four months, please send us an e-mail message (ar@casact.org).

One nice thing about *AR* on the Web site is that we can correct our mistakes as soon as they are discovered. I know, I know: the editorial staff is supposed to fix mistakes *before* anyone else is allowed to read a new issue. We do find and fix most of them, especially the small ones, the ones that only editors notice. Once in a while, unfortunately, we miss an obvious blunder, such as the top of page 19 in the August issue. What you *should have* seen was "ASTIN in <u>Bergen</u> by **<u>Kris DeFrain</u>**." We published the correct article, but under the title and author's name of *last year's* ASTIN article. The mistake was obvious to Kris DeFrain, who pointed out the mistake to us (and had every right to be much less polite than she was). I apologize for the error. We did fix it immediately in the on-line edition. Unfortunately, the hard-copy edition is cast in stone.

Well, paper, then.

Say, maybe that explains why no one else told us about the error! Does *anyone* actually open and read the hard-copy *AR* anymore? ■

Dear Editor,

I found unintended humor in the August 2004 issue of *The Actuarial Review*. The lead story on the front page, "CAS Board Debates the Status of Associates," describes the Task Force on Classes of Membership recommendation to eliminate an interim milestone in the exam process, the ACAS designation. The article right below this carries the headline, "Why Interim Milestones are Important." It struck me as funny….

Shantelle Thomas, FCAS

Dear Ed I. Tor,

The "Random Sampler" by **Clive Keatinge** in the February 2004 edition of *The Actuarial Review* raises several points deserving further discussion. To this end, here are some contrasting viewpoints—mine.

1. Should the *Proceedings* be discontinued? The *Proceedings* currently serves multiple functions including being the formal record of the CAS and being a forum for reviewed papers. Regardless of what we call it, as a professional society we need a formal record and this responsibility cannot be achieved through a joint publication. In regard to the second purpose, a casualty publication is needed to achieve the proper focus and emphasis on casualty actuarial science. Relying on the *North American Actuarial Journal* as a sole source for casualty actuarial publication of reviewed articles is inappropriate, whereas encouraging casualty actuaries to publish more widely is totally appropriate. To sum, we need the *Proceedings*.

"Relying on the *North American Actuarial Journal* as a sole source for casualty actuarial publication of reviewed articles is inappropriate...."

——Alfred O. Weller

2. The Actuarial Control Cycle. On reading *Understanding Actuarial Management: The Actuarial Control Cycle*, edited by Clare Bellis, John Shepherd, and Richard Lyon (The Institute of Actuaries of Australia, 2003), I felt like the man who was told that he would have to learn to respirate after breathing all his life. Concepts like testing rates in light of experience, assessing the uncertainty in loss reserves, establishing feedback loops and other controls in data flows, and managing projects to successful completion are inherent in being a casualty actuary and have been for almost a hundred years. I could recognize new vocabulary in the text, but I did not find any recommendations that would actually help casualty actuaries breathe better. To introduce another metaphor, a rose by any other name would smell as sweet. For this reason, I see little benefit in expending effort to incorporate the linguistics of the Actuarial Control Cycle into our professional education. Until it clearly enhances our ability to provide value to clients and employers it is an unnecessary frill.

3. Enterprise Risk Management (ERM). Clive is absolutely right in saying that ERM deserves more attention by casualty actuaries. In fact, the field is still young with much work to be done in establishing basic definitions and concepts. Now is the time to demonstrate the importance of casualty concepts to an actuarially sound foundation for ERM.

4. Restructuring the Actuarial Profession/Unifying Actuarial Societies. Checks and balances are crucial to American politics and protection of the rights of minorities. In a professional sense, the checks and balances of multiple actuarial societies are crucial to protecting the rights of casualty actuaries. A single actuarial society in the United States immediately creates the need for a countervailing society. Phrased differently, I would no more trust SOA leaders to represent the interests of casualty actuaries than, if I were a life actuary, I would trust CAS leaders to represent the interests of life actuaries.

Restructuring is not needed to advance the profession at this time and might never be needed. Members' accomplishments and contributions to economic value are far more telling.

Casualty actuarial science is a wonderfully diverse profession. I look forward to refining my opinions in light of further commentary in *The Actuarial Review*.

Alfred O. Weller, FCAS

"If we expect to attain the stature required by the CAS Centennial Goal, the *Proceedings* will not do for this purpose."

——Clive Keatinge

Clive Keatinge responds:

I agree that the *North American Actuarial Journal* should not be the sole

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Let Us Hear From You

The Actuarial Review welcomes letters and story ideas from our readers. Please specify what department you intend for your item—letters to the editor, or proposed news items, "Brainstorms," "It's a Puzzlement," etc. Here's how to reach us:

Letters and Ideas for *The Actuarial Review*
E-mail: AR@casact.org
Fax: (703) 276-3108
Mail: CAS, 1100 N. Glebe Road, Suite 600, Arlington, VA 22201. ■

Random Sampler

Chartered Financial Analyst Designation Expands Actuarial Expertise

by Curtis Gary Dean

The initials CFA are showing up on some actuaries' business cards, including my own. The CFA Charter is awarded by the CFA Institute, formerly the Association for Investment Management and Research. Key requirements for award of the charter are sequentially passing the Level I, II, and III examinations, and at least three years of acceptable professional experience. Actuarial work is acceptable professional experience. Other requirements, including maintaining a high level of ethical and professional conduct, can be found on the CFA Institute Web Site, www.cfainstitute.org.

The stated mission of the CFA Institute is: "To lead the investment profession globally by setting the highest standards of education, integrity, and professional excellence."

With more than 68,000 members in over 117 countries, the CFA Institute offers many educational conferences, Webcasts, and publications. About 82 percent of its members are CFA Charterholders, which translates into more than 55,000 Charterholders worldwide. According to their Web site, "The Chartered Financial Analyst (CFA®) Program is a globally recognized standard for measuring the competence and integrity of financial analysts." Its goals are similar to those of the CAS and American Academy of Actuaries, though their subject matter is different.

I scan each issue of their periodicals *Financial Analysts Journal*, *CFA Magazine*, and *The CFA Digest*, and usually read several articles to broaden my knowledge of finance and investment, both for professional education and to get ideas for managing my personal investment portfolio. Speaking to the latter purpose, the January/February 2004 issue of *Financial Analysts Journal* had an article, "Value and Growth Investing: Review and Update," in which the authors argue that the evidence continues to show that value investing generates superior returns over the long term, and the higher returns are not the result of assuming higher risk.

"A chief actuary… would benefit from CFA studies by developing a much broader perspective of the financial world."

CFA Examinations

Each CFA examination is six hours in length: three hours in the morning and three in the afternoon. Level I is offered in December and June, and Levels II and III are offered only in June. There are 1,500-2,000 pages of reading for each exam. The CFA Institute estimates that 10-15 hours per week for 18 weeks is necessary to prepare adequately for each of Levels I and II. For the three-year period 2000-2002, the ranges for the percentage of passing candidates were as follows: Level I, 47-55 percent; Level II, 44-52 percent; and Level III, 58-82 percent. The effort required to pass CFA exams is definitely less than that for upper-level actuarial exams, but I don't think that that makes them any less effective as an educational tool. Actuarial exams often require the regurgitation of too much unimportant detail, a common criticism, and this detail is quickly forgotten when the exam is over.

The readings and examinations are excellent. The readings include both standard textbooks and materials specifically written for the CFA examinations. The readings are informative and quite readable. The exam questions are usually clear and relevant and I thought that it was fun to take the exams. Each exam has a corresponding study guide organized into about 18 study sessions listing the readings and a comprehensive set of learning outcomes, making it easy to develop an organized study plan.

Topics Covered on the Exams

The CFA curriculum is targeted towards the investment profession, but its broad curriculum makes it appealing to a much wider audience, including actuaries. Anyone with significant responsibilities in the financial area at a medium-to-large company might benefit from CFA studies, especially CFOs. For example, a colleague of mine in a local CFA Institute affiliate manages currency hedging for a company with international operations.

The topics are organized into four areas:

- ethical and professional standards,
- investment tools,
- asset valuation, and
- portfolio management.

Investment tools include economics, quantitative analysis, and financial statement analysis. In the quantitative

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A Message from ARIA

ARIA Planning for World Congress in '05

by James Carson, Ph.D., CPCU, CLU, ARM, Florida State University Midyette Eminent Scholar of Risk and Insurance and Editor, *Journal of Insurance Issues*

As the 60th president of the American Risk and Insurance Association, I'm very happy and honored to have this opportunity to share a few thoughts with you, the esteemed members of the Casualty Actuarial Society. I will highlight just a couple aspects of ARIA that I believe may be of interest to many of you.

Although ARIA began primarily as a U.S. organization, we now have a significant international component—roughly one-quarter of ARIA's membership is from outside the U.S., composed of 135 members from 29 countries. Because our international growth is something that we should value and encourage, we are joining forces with several other prominent organizations to host the first World Risk and Insurance Economics Congress next year (August 7-11, 2005) in Salt Lake City, Utah. The primary organizations involved in planning the event include ARIA, APRIA (Asia-Pacific Risk and Insurance Association), EGRIE (European Group of Risk and Insurance Economists), and GA (The Geneva Association). This event will be a unique and great opportunity to host a gathering of academic, regulatory, and professional leaders from around the world—we hope that many of you are able to join us, especially since the CAS is sponsoring the meeting and is awarding a prize for the best non-life insurance paper at the conference!

The host hotel for the 2005 WRIEC is the Sheraton City Centre, located in the heart of downtown Salt Lake City. We invite your participation to present research on any topic related to risk management, insurance, and actuarial science. The deadline for WRIEC proposal submissions is **January 5, 2005**. For more information on the meeting, see the Web site at www.wriec.org.

In addition to ARIA's two academic journals (*Journal of Risk and Insurance* and *Risk Management and Insurance Review*), another important part of ARIA is the Risk Theory Society. The Society is a self-administered organization within ARIA whose purpose is to foster research into topics in risk theory and risk management. The main function of the Society is an annual meeting where papers that have been distributed to members in advance of the meeting are presented and discussed critically. The Society's membership is small (fewer than 100 members) but diverse. Membership includes nine actuaries, and members come from at least six countries: Belgium, Canada, France, Israel, Switzerland, and the United States.

For information on ARIA, WRIEC, or the Risk Theory Society, please see the ARIA Web Site at www.aria.org. I hope to see you in Utah next summer and I look forward to continuing to strengthen the relationship between ARIA and the CAS. ■

Actuaries in Kazakhstan

In September 2004, three CAS members traveled to Kazakhstan to teach a week-long educational program for members of the Actuarial Society of Kazakhstan (ASK). Below, posing with ASK members is Ginger Shafer (front row, third woman from left), who coordinated the trip through the Arizona-Kazakhstan Partnership Foundation, Inc. (AzKz). Shafer is the operations manager for the Foundation. Pictured left of Schafer, dressed in the traditional Kazakh attire of *chapan*, are **Jimmy Shkolyar**, **George A. Rudduck**, and **Peter J. Murdza Jr.** Standing in the second row behind and pictured to the left of Murdza is Khalida Kyrykbayeva, Kazakhstan's representative to the Foundation. The AzKz is a publicly supported non-profit 501(c)(3) corporation devoted to strengthening the ties between the United States and Kazakhstan. Foundation objectives include conducting institutional and business development exchanges, creating mutual educational programs, initiating trade activities, and expanding cultural ties. The Foundation's primary activity is developing and nurturing partnerships that provide first-hand experience in democratic processes for individuals in organizations in Kazakhstan. Foundation programs are financed in part by the U.S. Agency for International Development. For more information, visit www.az-kzpartnership.org. ■

Twenty Heads are Better than One

The Wisdom of Crowds: Why the Many Are Smarter than the Few and How Collective Wisdom Shapes Business, Economies, Societies, and Nations by James Surowiecki [Doubleday, 2004, $24.95]

Reviewed by Curtis Gary Dean

Contestants on the TV game show *Who Wants to Be a Millionaire* have three "life lines" to help them as they answer multiple-choice questions to work their way up the money ladder. If they are stumped on a question, one lifeline is to call a friend or relative. Most likely the contestant has some faith in the friend's ability. According to the author, the friend is correct about 65 percent of the time, a pretty good result given that a random selection would be correct 25 percent of the time. Another lifeline is to ask the audience. The audience votes on the four possible answers and vote counts are tallied and displayed for each answer. The audience does better, much better, with the answer getting the most votes being correct 91 percent of the time!

This simple audience vote illustrates the author's thesis: the aggregated opinion of a group of people regularly beats the experts in solving problems, and this competence extends to a wide range of situations. (It may be a stretch to call the friend an expert, but it is intriguing to note how much better the group does than the friend.) In fact, experts often do poorly with complex problems, while a group of people, many with limited expertise, may produce excellent solutions. The author is a staff writer for *The New Yorker*. He provides many interesting and diverse examples showing the astonishing accuracy of group solutions. He supports his arguments with results from academic and business studies.

How can the solution from a group be so accurate? The author's contention is that the solution for each member of a group consists of two components: one component reflects the actual knowledge of the member and the other component is random error. The key concept is that over a group the average of the random error components tends towards zero, letting the total average reflect the sum of the actual knowledge within the group. Just like in ratemaking, aggregating a group of policies gives us a better picture of the expected value.

"...the aggregated opinion of a group of people regularly beats the experts in solving problems, and this competence extends to a wide range of situations."

For the crowd's wisdom to shine, four conditions should be present: (1) diversity of opinion, (2) independence, (3) decentralization, and (4) aggregation. Diversity of opinion expands the set of possible solutions. Independence is necessary for the error components of individual solutions to average out to zero, and independent individuals are more likely to have new information. Decentralization reduces the likelihood that a central authority can control the outcome or thinking of the group.

Some mechanism is necessary to aggregate the crowd members' individual opinions. In the example above, aggregation is accomplished through voting: one vote per person. In the Iowa Electronic Markets the aggregation is accomplished by prices for real-money futures. These markets are operated by faculty at the University of Iowa Tippie College of Business. Participants can make small bets on the outcome of political or economic events. Check out www.biz.uiowa.edu/iem. As of the middle of the day on July 27, 2004, the last trade price for a DEM04 contract was $.502. This contract will pay $1 to the holder if the Democratic presidential candidate receives the highest popular vote in the November '04 election. The last trade price for a REP04 contract was $.505. In the world's financial markets, asset prices reflect the "voting" of market participants. The search engine Google uses a weighted voting process where each link to a Web page counts as a vote, and the weight of a vote depends on the importance of the other linked page, which again is determined by voting.

The author also discusses the pitfalls of collective decision making. Dissent is often buried as a group tries to reach a consensus. The author explains that even one dissenting opinion can force a group to act more wisely because the group now has to go back and examine the facts and inferences. Disagreement and conflict of ideas are more likely to result in an eventual good

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From the Readers

From page 4

source of reviewed casualty papers. As I stated in my article, I believe we also need "to join with actuarial organizations outside North America to create a new journal that focuses on topics of interest to practicing casualty actuaries worldwide." If we expect to attain the stature required by the CAS Centennial Goal, the *Proceedings* will not do for this purpose. We need a casualty journal that is published more than once a year and that does not contain extraneous material. I agree on the need for a formal record of CAS activity, but it does not need to be mixed in with journal articles. The Actuarial Control Cycle is an idea around which to structure actuarial education, not just a text to be added to the syllabus. The particular book to which Mr. Weller refers may or may not be appropriate as source material for us. Experienced actuaries like Mr. Weller may find the Actuarial Control Cycle to be of little use; those new to the profession may feel otherwise. I find it interesting that Mr. Weller chooses to point to the government of the United States as a model. The United States has a single central government with checks and balances built in to ensure that no one branch dominates the others. I agree that this is an excellent blueprint for the actuarial profession in the United States. ■

CAS Welcomes New Affiliate Member

Tobias Hoffmann
Pricing Actuary
GE Frankona Re
Munich, Germany
Fellow, German Actuarial Society

Random Sampler

From page 5

analysis section of the syllabus, I got a nice review of statistics, multiple linear regression, and time series that helped me remember what I had forgotten from the actuarial exams.

A wide variety of financial assets are covered in the readings: bonds, asset-backed securities, stocks, real estate, venture capital, options, forwards, futures, and swaps, as well as combinations such as "swaptions." Both the valuation and risks of assets are studied. Most of the assets that you would find on an insurance company's balance sheet or in a pension fund's portfolio are analyzed. Risk analysis and the mitigation of risk through diversification and hedging are topics that should be of particular interest to actuaries. Financial risk, both its analysis and treatment, receive much greater attention here than on CAS exams.

Which Actuaries Would Benefit From CFA Studies?

I started CFA studies because I am a voracious reader, usually nonfiction, have a long-term interest in investing, and am totally committed to continuing professional education. I'm sure that many other actuaries have similar motivations.

There is overlap between the CFA and actuarial syllabi, but the corporate finance and asset sections of the actuarial exams are a subset of the much broader CFA curriculum.

If you work in the investment area of your company, you may have already started or completed the course of study. A chief actuary who is a member of the company's senior management team would benefit from CFA studies by developing a much broader perspective of the financial world. Actuaries heavily involved in DFA modeling can broaden their understanding of the asset side of the balance sheet as well as gain a better knowledge of important issues such as financial hedging.

One of the CAS core values is: "The belief that the continuing effectiveness of a casualty actuary is built upon dedication to the idea of life-long learning." A section of the CAS Centennial Goal is: "CAS members will be recognized as the leading experts in the evaluation of hazard risk and the integration of hazard risk with strategic, financial, and operational risk." CFA studies are consistent with both of these statements and actuaries who have completed the CFA exams should be particularly suited to help the CAS in the evaluation and integration of financial risk. ■

Quarterly Review

From page 7

collective decision than early consensus or compromise.

Groupthink may push a group further away from a good solution into more extreme positions, a condition referred to as group polarization. Another problem is that groups often give too much weight to the rank and status of particular members. Many groups are sorely lacking in cognitive diversity. Poorly structured or managed groups can produce disastrous results as in the Columbia shuttle tragedy, a case discussed at length in the book.

Our modern society is a mixture of coordination, collaboration, and competition. There is often a conflict between maximizing personal gain and contributing to social welfare. The author discusses some of the conflicts and the methods that have evolved to handle them.

Actuaries are regularly involved in important and complex decisions, both as individual experts and as members of a group. This short and easy-to-read book should be of interest to most. We regularly participate in collective decision making but rarely think deeply about the structure and dynamics of the process. The author provides plenty to think about as he discusses decision making in corporations, markets, and societies. ■

Review of CAS Research Activities

by Donald F. Mango, CAS Vice President-Research and Development

Among the feedback from the most recent membership survey was a recommendation that "the CAS better publicize the availability and organization of its research." This recommendation was made because the members said that they are not aware of all the research activities sponsored by the CAS. This article represents a first step towards raising awareness of our research activities.

First, I call your attention to the "Latest Research" column of the *AR*. Each quarter this column presents an update on current CAS research. This is an easy way to keep up to date on research activities.

In the remainder of this article, we will be discussing:

- Research Committees
- CAS Working Parties
- Call Paper Programs
- Sponsored Research
- Seminar Sessions
- International Research
- Research Accessibility
- Research Initiatives Coordinator

Research Committees

Many members are unaware of our research committees. Under the members section of the CAS Web Site, you can find the list of research committees: Dynamic Risk Modeling, Health and Managed Care Issues, Management Data and Information, Principles, Ratemaking, Reinsurance Research, Reserves, Theory of Risk, Valuation, Finance and Investments, Enterprise Risk Management, and International Research. The committees are the engines driving and coordinating most of our research activity.

CAS Working Parties

The CAS introduced a new research approach in 2003: Research Working Parties (WPs). These are task forces, under the leadership of members from CAS Research Committees, with the specific charge to produce a single research product over the course of a year. WPs have proven to be effective mechanisms for the General Insurance Research Organization (GIRO), the general insurance arm of the Faculty and Institute of Actuaries (U.K.). A list of all of the WPs with completed projects or work in progress can be found on the CAS Web Site.

The first WP to complete its charge is Executive Level Decision Making using Dynamic Risk Modeling (DRM), co-chaired by **Michael Larsen** and **Nathan Babcock**. The WP's products can be found at www.casact.org/research/drmwp. This WP was formed to give practicing actuaries help in developing effective DRM presentations for senior management. The WP did an outstanding job producing PowerPoint templates that CAS members can use in their own work. It is a great example of the value of the WP, and of our renewed focus on practical research with tangible impact.

Another WP is the Quantifying Variability in Reserve Estimates WP, co-chaired by **Roger Hayne** and **James Leise**. This WP received enormous interest, and is charged with preparing a survey paper discussing methods currently used to quantify variability in loss reserves with unified notation and terminology. An update on their progress was presented at the CLRS in Las Vegas. We also have active WPs on Correlations and Dependencies Among All Risk Sources (co-chaired by **Glenn Meyers** and **Kevin Dickson**) and Elicitation and Elucidation of Risk Preferences (co-chaired by me and **David Ruhm**).

The Dynamic Risk Modeling Committee's two new WPs on the Dynamic Risk Modeling Handbook and the Public-Access DFA Model are in the early stages of work. Also, the Committee on Reserves has recently called for volunteers for two new WPs on Tail

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Rogers Reaches 10-Year Milestone with the CAS

Todd P. Rogers, CPA, the manager, finance and administration for the CAS Office, celebrated his 10th anniversary of service in October 2004.

Rogers joined the CAS Office on October 24, 1994 as the financial administrator and quickly took on additional responsibilities in the areas of membership, information systems, and office management. His current responsibilities include overseeing the CAS's $5.4 million budget and working with the Finance, Investments, and Audit Committees as well as the outside auditors. In addition to his financial duties, he is the staff member responsible for managing administrative support to the committees supporting membership such as the Regional Affiliates Committee and New Fellows Committee. Four staff members report to Rogers.

Rogers' long service to the CAS has been marked by excellent management of the CAS's finances, including its investments, and consistently clean opinions by the independent auditors.

Congratulations, Todd! ■

Factors and Bornhuetter-Ferguson Initial Expected Losses. Stay tuned for more opportunities to participate in and benefit from WPs.

Call Paper Programs

Research committees continue to sponsor research call paper programs. We currently have a 2005 Call for Reinsurance Papers and a 2005 Discussion Paper program. The 2005 Ratemaking Call and 2005 Management Data and Information Call are well underway. Research from these two papers calls will be presented at the Ratemaking Seminar in March 2005. Papers from the 2004 Reserves Call were presented at the most recent CLRS, and are available in the latest issue of the *Forum*. The papers from all prior calls can be found online at the CAS Web Site under " Publications."

Sponsored Research

CAS research funding has sponsored or is sponsoring a number of valuable research products over the last twelve months, including:

- Risk Premium Project;
- Modeling of Economic Series Coordinated with Interest Rate Scenarios;
- Valuation of P&C Insurance Companies, General Survey;
- Study of the Implications of Fair Value on P&C Insurers;
- Workers Compensation Ratemaking: A Textbook for the Practicing Actuary;
- Comparison of Rating Agency Capital Models.

Many of these ideas came to us through the Actuarial Foundation, the combined research entity co-sponsored by the CAS, SOA, CIA, ASPA, AAA, and CCA.

Seminar Sessions

Check the programs for CAS seminars and you will find presentations on various research activities, including presentation of call papers, prize-winning papers from nonmembers, and updates on WPs. As an example, the 2004 CAS Spring Meeting had sessions on the funded research on the implications of Fair Value on P&C Insurers, the ARIA Prize paper, an update from the WP on Correlations and Dependencies, the final report of the WP on Presenting DFA Results to Decision Makers, the final report on Valuation of P&C Insurance Companies, General Survey, a summary of the Risk Premium Project, a Discussion Paper Program on Generalized Linear Models, and two *Proceedings* papers!

International Research

In support of the CAS Centennial Goal, we have expanded international research efforts in several ways. First, we formed the International Research Committee (IRC), chaired by **Gary Venter**. This committee monitors international research that may be of interest to CAS members; produces summaries for CAS publications; arranges for presentations at CAS sponsored meetings, including facilitating presentations by original authors; finds avenues for exposing CAS research internationally; and increases North American CAS members' awareness of and visibility at international meetings. The IRC will be publishing regular updates in the *AR*.

The CAS also earmarks funds as part of the international budget for travel and presentation at key international actuarial conferences. As reported in the August *AR*, we had a large CAS presence at the 2004 ASTIN meeting in Bergen, Norway. We will similarly have greater CAS representation at the 2004 GIRO Conference in Killarney, Ireland. We also have encouraged CAS members to submit papers to the *ASTIN Bulletin*.

Research Accessibility

A number of interrelated initiatives are centered on improving the accessibility of our research papers, making the CAS Web Site an international resource for risk and actuarial science professionals worldwide.

Abstracts Database Overhaul

Erin Clougherty, CAS Information Specialist, led the creation of an all-inclusive online research tool for casualty actuarial science literature, replacing the Online Database of Actuarial Abstracts. The database will allow for browsing of the articles by taxonomy category (see below), as well as enhanced searching capabilities. The database will be constantly updated with relevant articles to casualty actuaries from a wide variety of publications. An additional enhancement is the linking of paper discussions to the original papers.

CAS Research Taxonomy

The CAS Research Taxonomy is a categorization scheme for casualty actuarial science literature. The taxonomy will dramatically improve the ability to identify research articles by standardizing the terminology. A draft version of the taxonomy was presented for member feedback during Q1 2004, and Version 1 (reflecting member input) will be the basis of the paper categorization efforts.

Paper Categorization

In an effort to maximize the value of the CAS Web Site's Online Database of Actuarial Abstracts and the taxonomy, we have drafted (via the Participation Survey) a group of Research Paper Classifiers. The initial focus of these volunteers involves classifying the 4,000 citations currently in the database. This process is expected to take less than three months. Once that is complete, there will be an ongoing effort to classify new citations as they are added to the database. We can always use more volunteers to help with this classification project, so if you are interested, please contact the CAS Office.

Research Paper Template

A research paper template has been developed to allow for a consistent appearance and structure for papers published in the CAS *Forum*. It too was presented for member feedback during Q1 2004, and the latest version reflects member feedback. Going forward, all CAS WPs and call paper authors will be required to use the research paper template when submitting their papers.

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Opinion

Benchmarking ERM Practices in a Derivatives Firm

by Donald F. Mango

As we move towards the CAS's Centennial Goal of international property-casualty resource and enterprise risk management (ERM) expertise, it is helpful to benchmark ourselves against sister professions and industries farther down the ERM road.

Arguably the closest parallel firm to an insurer is a securities firm, particularly one buying and selling derivatives. In derivatives parlance, insurance contracts would be something like "long-dated, illiquid, over-the-counter (OTC, meaning customized) derivatives on untraded underlyings." This is not meant to say that insurance should be *accounted for* the same way as derivatives, although the Fair Value accounting standards are certainly moving us closer to that.

A good source of information about derivatives risk management is *The Practice of Risk Management*, by Goldman Sachs (GS) and Warburg Dillon Read, published by Risk Books in 1996. This excellent industry standard details the functioning of the centralized risk management group of a derivatives dealer. It is highly recommended reading; you can read a review of it on the CAS ERM Research Committee's Web page (www.casact.org/research/ermtexts.htm).

Arguably the closest parallel firm to an insurer is a securities firm, particularly one buying and selling derivatives.

Per GS, the five main areas within derivative risk management are (see table below):

1. Risk monitoring and analysis
2. Quantitative analysis
3. Price verification
4. Model development
5. Systems development and integration

Actuarial Parallels

The second column in the table shows the detailed roles and responsibilities within each area. The third column translates from derivatives to insurance, revealing the strong parallels with traditional actuarial roles and re-

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Area	Derivatives Roles and Responsibilities	Actuarial Equivalents*
1. Risk Monitoring and Analysis	•Monitor position and price data •Evaluate risk exposures •Identify and monitor limit violations •Analyze potential scenarios •Summarize and report on risk exposures •Reconcile with other areas •Perform backtesting	•Monitor **reserve** and price data •Evaluate risk exposures •**N/A** (*The monitoring of underwriting authorities is usually done within the underwriting risk management area.)* •Analyze potential scenarios •Summarize and report on risk exposures •Reconcile with other areas •Perform backtesting **(e.g., reserve run-off tests)**
2. Quantitative Analysis	•Determine modeling for new products •Design new quantitative models •Test new models	•Determine modeling for new products •Design new quantitative models •Test new models
3. Price Verification	•Verify prices of complex derivatives •Track changes in pricing models	•Verify prices of complex **policies or treaties, or blocks of business** •Track changes in pricing models **and rates**
4. Model Development	•Develop new models for system •Develop risk analysis tools •Maintain historical return data	•Develop new models for system •Develop risk analysis tools •Maintain historical **reserving and pricing** data
5. Systems Development and Integration	•Develop infrastructure to support processing •Accept feeds from other systems •Automate data scrubbing and translation •Develop database to support risk data	•Develop infrastructure to support processing •Accept feeds from other systems •Automate data scrubbing and translation •Develop database to support risk**, pricing and reserving** data

*Bold type indicates additions or differences

Opinion

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sponsibilities (bold text in the table indicates additions or differences in actuarial roles and responsibilities).

Really only one item (monitoring limit violations) has no direct actuarial parallel. The others line up nearly one-for-one, with only minor terminology changes needed. This is startling evidence that traditional actuarial roles are already part of core risk management.

Actuaries as Markets of One

For exchange-traded securities of all kinds, firms will "mark-to-market" (M2M) their portfolio for both risk management and value reporting to investors. M2M means the booked (marked) value of the security is its current market value taken from industry standard sources like Bloomberg or Reuters. M2M reduces the risk of what is known as "self-marking," where a trader may book inflated values for their portfolio to boost their own compensation. Nick Leeson's self-marked portfolio brought down Barings Bank in a now infamous 1995 derivatives scandal. Therefore, there is a risk management imperative that there be no self-marked portfolios. M2M prevents that, by letting the value be set by the collective wisdom of multiple valuation opinions inherent in an exchange market price.

M2M methods become much more difficult when dealing with nontraded securities—for example, private equity, hedge funds, or OTC derivatives. Securities firms cannot allow the conflict of interest of self-marking, so they use the expertise of an independent, centralized risk management team to help value these portfolios. The risk management group may be involved in any number of ways, from sign-off on valuation models and parameters, all the way to individual re-pricing of transactions. Typically this requires risk management personnel to have tremendous expertise and experience, backbone, and organizational independence from the trading units. Sound familiar?

Viewed in this light, we now see the valuation (or reserving) exercise as the "marking" of a complex portfolio by the centralized risk management group. The conflicts that inevitably arise between valuation actuaries and product-line advocates should therefore come as no surprise; our derivatives risk management counterparts live with the same organizational tensions. These tensions are healthy, necessary checks and balances. Better communication and trust may reduce the tensions over time, but there may be an irreducible element attributable to the organizational structure and the nature of the role itself.

Actuaries and ERM

What does this mean for ERM? Three things immediately come to mind:

1) Actuaries must learn about ERM. This needs to start today! The actuarial societies can provide learning opportunities, but **all members** must take it upon themselves to read, understand, and start applying the ERM concepts and terminology. We need to start changing the way we think and communicate.

2) Actuaries must reframe their traditional roles as part of the larger ERM context. This will entail modifying our work products, basic education, continuing education, and public communication. This is a reframing exercise where we stake our claim to the ERM leadership of property-casualty insurance.

3) Actuaries must prepare to be part of the new Risk Profession. There is a new profession forming from a convergence of accounting, internal auditing, regulatory, actuarial, insurance, "traditional" risk management, and more advanced financial risk management in banking, insurance, securities, and energy. It will span all areas of human activity. The opportunity for leadership of this profession is upon us, but the form of that leadership and the nature of our role are not clear. Some believe we need to expand the actuarial profession, while others believe collaboration is necessary. No matter the leadership tactics we employ, all actuaries must get involved, participate in the debates, prepare for this evolutionary step, and support any initiatives. ■

Research Initiatives

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Research Initiatives Coordinator

All these initiatives were overtaxing the VP of R&D (me!), who in desperation reached out to **Stewart Gleason**. Stewart made the "fatal error" of expressing strong, informed opinions regarding some of our new research ideas. His reward: a new position as research initiatives coordinator! He is a resource for the CAS Research and Development Committees regarding the implementation of WPs, the research paper template, stricter call paper editorial standards, the taxonomy, and the paper categorization. Stewart's creativity and energy have been invaluable as we move down these new roads.

Whom to Contact

Comments, questions and ideas can be sent to me, Stewart, the chairs of any of the research committees, or Mike Boa and Erin Clougherty, the CAS staff supporting research. ■

CAS Forming Online Repository of Research Papers

A task force has been formed to implement an online storehouse for research works in progress. The papers will be available for review and comment. Feedback from members is strongly encouraged. Look for more information at www.casact.org. ■

intended by that actuary to be relied upon by the outside person or organization to which the opinion is addressed."

By this definition, almost *anything* that you do that leaves your immediate employer will be covered by the qualification standard.

"...would requiring you to report your continuing education help you meet the continuing education requirements?"

There are several tests that you must meet to be qualified to sign SAOs in the property/casualty area:

1. Basic education. You need to know which actuarial concepts and techniques are applicable to your assignment and how to apply them successfully. At a minimum, you should have completed examinations in general actuarial mathematics; the identification, evaluation, and management of risk (for property/casualty exposures); and applicable principles of economics and finance.

What if you became a member of the CAS some time ago? Certainly, you passed the actuarial mathematics and risk portions of the exams, and most likely you were tested on economics as well. What about finance? If you previously satisfied the basic education requirements, which in a previous version did not require finance, then you are not required to pass a finance exam.

2. Knowledge of applicable laws and regulations. If you prepare an SAO to comply with a law or regulation, you are obliged to understand the applicable laws and regulations. This knowledge can be obtained through work experience, courses, self-study, or examination. (By the way, if your SAO falls in this category, it is already a PSAO and the *current* general qualification standard applies.)

3. Experience. You must have experience involving significant responsibility in the property/casualty area of practice. The standard defines sufficient experience qualitatively rather than quantitatively. You must:

"...be sufficiently experienced to know how to apply proper techniques of validating data and results of analyses, and must have achieved sufficient breadth of perspective to determine properly whether or not all material considerations have been addressed within the Statement of Actuarial Opinion."

4. Continuing education. The first test, however, is whether you have sufficient current education to maintain current knowledge of applicable standards and principles of practice. At a minimum, you will need 12 hours each year of continuing education, just as in the current standard for PSAOs. You must meet the 12-hour standard in each area of practice for which you issue SAOs. (That is, if you also practice as a health actuary, you must have 12 applicable hours in health as well as 12 hours in P&C—although some hours may apply to both). The 12 hours are measured by checking for 24 hours over the preceding two calendar years.

At least six of your annual 12 hours must be in "organized activities," and up to one-third of your time may be devoted to professionalism education. For most actuaries, "organized activity" means attendance at seminars or meetings, where a 50-minute session counts as an "hour." Passing actuarial exams and correspondence courses also counts as organized activity. (Studying for exams and not passing is not considered organized activity!) There is no requirement in the proposed standard that you report your continuing education to anyone, just that you keep accurate records.

I encourage you to read the proposed standard carefully. There are few standards that apply to so broad a population, and it's critical that we adopt an appropriate standard. We can only do that with your input. For instance, would requiring you to report your continuing education help you meet the continuing education requirements? And do you think that otherwise-qualified, experienced actuaries should be required to learn, as part of their continuing education, the new topics that are added to the exam syllabus over time? The comment deadline is December 1, 2004.

"...do you think that otherwise-qualified, experienced actuaries should be required to learn...the new topics that are added to the exam syllabus over time?"

I would like to close by drawing your attention to one more qualification standard: the Specific Qualification Standard for the Statement of Actuarial Opinion for the NAIC Property & Casualty Annual Statement. This specific standard is not changed by the AAA proposal. *Membership in the CAS alone is not sufficient to sign an NAIC statement. You must meet the additional requirements of the Academy's specific qualification standard.* In addition to meeting the general qualification standard, you must have passed the relevant CAS exams on policy forms and coverages; underwriting; marketing; ratemaking; statutory accounting; expense analysis; and premium, loss and expense reserves. That requires exams 5, 6, and U.S.-7 (if you didn't pass the U.S. practice exam, there is an alternative that requires attestation by another actuary). You are also required to have a minimum of three years of experience under review by an actuary who is qualified under the Specific Qualification Standard.

Do you measure up? ■

Table 1	
Current Education Structure	**New Education Structure**
Prerequisites: Linear Algebra and Statistics	Prerequisites: Calculus and Linear Algebra
Exam 1: Calculus and Probability – 4 hours	Exam 1: Probability (with supporting Calculus) – 3 hours
Exam 2: Interest Theory, Economics, and Corporate Finance – 4 hours	Exam 2: Financial Mathematics – 2 hours VEE –Economics VEE –Corporate Finance
Exam 3: Actuarial Models – 4 hours	Exam 3: Statistics and Actuarial Models – 4 hours
Exam 4: Actuarial Modeling – 4 hours	Exam 4: Construction and Evaluation of Actuarial Models – 4 hours VEE–Applied Statistical Methods

and four exams. A summary of the transition from the current structure to the new structure is summarized in Table 1.

Changes to Exams 1-4 will be as follows. For Exam 1, direct testing of Calculus will be removed, and the material will be narrowed to Probability only. Calculus is now a prerequisite and will be indirectly tested through Probability questions on Exam 1. After the Spring 2005 sitting, this three-hour exam will be offered by computer-based testing (see article, page 15).

The subjects of Economics and Corporate Finance that are tested on the current Exam 2 will fall under the VEE category rather than being tested on this exam. Exam 2 will then be limited to Financial Mathematics (Interest Theory).

The only change to Exam 3 will be the addition of statistics. Applied Statistical Methods (time series and regression) will be taken off the current Exam 4 and moved to the VEE category. This should move the focus away from memorizing formulas for Exam 4 and towards analyzing data.

Exams 1, 2, and 4 will remain joint exams with the SOA, and Exam 3 will remain a CAS-only exam. Syllabi for new Exams 1-4 are located at www.casact.org/admissions/syllabus/pe2005/.

Validation by Educational Experience can be satisfied in one of four ways:

1. College Course(s)

Earn a B- or better on college or university courses approved by the CAS/CIA/SOA. A list of approved courses will be available online. Course instructors and/or candidates will be able to submit course information for approval.

2. Standardized Exams

Achieve a pre-set score on standardized exams such as Advanced Placement (AP) exams. The VEE Administration Committee (VEEAC) will determine which other examinations qualify and the score required for credit.

3. Transitional VEE Exams

Pass a CAS transitional VEE exam. In August 2005, 90-minute exams for VEE-Economics, VEE-Corporate Finance, and VEE-Applied Statistical Methods will be offered. The CAS will also offer the transitional VEE exams in 2006, at which time the CAS will reevaluate whether there is a need to continue the transitional exams.

4. Other Educational Experiences

Online courses, intensive seminars, and other options are expected to become available in the future.

In order to reduce administrative cost, candidates will not be allowed to submit their VEE evidence until after they have passed two exams. However, there will be no time limit on when VEE experiences were completed. Details on the process to obtain VEE can be found at www.casact.org/admissions/news/vffprocess.htm. Also, the syllabi for the three transitional VEE exams can be found at www.casact.org/admissions/news/vffexams.htm.

Table 2 shows how the transition rules will apply to the revised preliminary education structure.

Table 3 shows how the transition rules will also apply for candidates with **unused** credit from exams administered prior to 2000.

Practical Considerations for Employers and their Candidates

With these significant changes just around the corner, employers will want to consider how these changes affect their Actuarial Candidate programs. Some of the issues that were discussed at a recent Candidate Liaison Committee teleconference included:

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Table 2 shows how the transition rules will apply to the revised preliminary education structure.

Current Credit	Credit Under New System
Exam 1	Exam 1
Exam 2	Exam 2, VEE–Economics, VEE-Corporate Finance
Exam 3	Exam 3
Exam 4	Exam 4, VEE–Applied Statistical Methods

Table 3 shows how the transition rules will also apply for candidates with **unused** credit from exams administered prior to 2000.

Pre-2000 Credit	Credit Under New System
Exam 3A	VEE–Applied Statistical Methods
Exam 4A	Exam 2
Exam 4B	Exam 4
Exam 5A	VEE–Economics
Exam 5B	VEE–Corporate Finance

VEE Credit

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- **Study Time**

The length of some of the CAS exams will be shorter than the current standard of four hours. Most notably, Exam 2 will be a two-hour exam. Should candidates now be allotted less work-study time for this exam compared to the other four-hour exams? Also, will those candidates who opt to obtain VEE credit through the transitional VEE exams be allowed study time at work? And if so, how much time should they get? Other exams will be affected as well. With Exam 1 eventually becoming a computer exam being offered multiple times throughout the year, employers may need to change their study programs to accommodate this.

- **Exam Raises**

Will the schedule for raises need to be modified now that candidates must have credit for both exams and VEE requirements? Will a candidate receive an exam raise for obtaining VEE credit? It seems logical that a raise would be given for passing one of the transitional VEE exams, but how will it work when credit is obtained through college courses? Will there be raises for completing online courses or intensive seminars? With some of these processes being offered throughout the year, rather than just in May and November, will employers be able to give "exam" raises off-cycle?

- **Costs of Candidates Satisfying VEE Requirements**

Some candidates will be satisfying these requirements through seminars or online courses, which will likely have varying costs. Will these costs be paid in the same way as regular exam costs or any other educational support currently offered to employees?

Employers should stay current on all of these exam changes and communicate to their candidates. Further details about the new exams and VEE can be found in the "Admissions" section of the CAS Web Site.

CAS candidates may contact universities and request that relevant courses be submitted to the VEE Administration Committee for approval. Candidates may begin to submit requests for course approval and for individual VEE credit in January 2005. ■

Exam 1 To Become a Computer-Based Test in 2005

In May 2005, Exam 1 will be offered in the traditional pencil-and-paper format. It is anticipated that in September 2005, Exam 1 will be offered by computer-based testing (CBT) during a period of about one week. Grades will be released in the traditional manner—passing candidate numbers will be posted online and an official grade report will be mailed to each candidate. There will be no November 2005 administration for Exam 1 as it will be offered by CBT again in early 2006, a year in which Exam 1 will be offered more than twice. In subsequent years, Exam 1 will be available multiple times per year with immediate grading.

CBT will be available in the majority of localities where the pencil and paper version currently is administered. In the few areas where CBT is not available, other options are being explored for administering the exam. In areas where CBT is available, the exam will be administered exclusively by CBT.

Details about the CBT administration of Exam 1 will be posted on the CAS, CIA, and SOA Web Sites. ■

Classes of Membership

From page 1

Since the previous meeting, there had been several information-gathering initiatives, including the first survey of the new Member Advisory Panel.

The extensive discussion resulted in a series of board resolutions. First, the board instructed the CAS Executive Council to establish a task force to propose within the next year a set of learning objectives by which Fellowship be attained:

- with less material than the current exams,
- with fewer than the current nine exams,
- while meeting the requirements of the IAA,
- while being consistent with the CAS Centennial Goal.

As part of its resolution, the board expressed its sense that this can be accomplished in eight exams (or seven exams with a workshop or seminar).

The board further resolved to inform the CAS membership of the foregoing action, with an indication that the board supports a move to an eventual single class of credentialed membership, with no more new Associates, concurrent with the movement to a shorter syllabus; and will seek membership reaction to this plan. (The then-current Associates would either complete their remaining exams and become Fellows, or remain Associates permanently.)

The board also resolved to postpone further action on the ACAS vote, pending resolution of the classes of membership issue. Finally, the board disbanded the Classes of Membership Task Force with its thanks for the excellent work on a difficult topic. In addition to chairperson Rosenberg, members of the task force included **Linda K. Brobeck, Joseph A. Herbers, Janet S. Katz, J. Gary LaRose, Kevin M. Madigan, Ellen K. Pierce,** and **Oakley E. Van Slyke**. ■

Opinion Changes Coming

by Mary D. Miller

The Annual Statement Instructions for the Property Casualty Actuarial Opinion have been significantly revised for year-end 2004. In August 2001 the NAIC's Casualty Actuarial Task Force (CATF) formed the Actuarial Opinion Instructions Working Group, led by **Richard Marcks**. Its purpose was to review the Instructions, consider the history and intent of the Opinion, and recommend changes, if any, to the CATF.

As a result, the 2004 Instructions reflect both structural and substantive changes. Substantive changes generally involve additional disclosures, as well as formally acknowledging regulatory reliance on Actuarial Standards of Practice of the Academy and Statements of Principles of the CAS.

The major structural change in the Instructions is the addition of two required exhibits at the end. They consolidate the Scope and Disclosure amounts in one place, allowing the reader to quickly identify all items, recognizing $0 values in one place, and enabling quick comparisons with the prior year.

The notable added disclosure for 2004 is the "Materiality Standard expressed in $US." This is to be the materiality standard used to evaluate the Risk of Material Adverse Deviation as described in Section 3.3.3 of ASOP #36. While ASOP #36 only requires disclosure of this standard IF the actuary reasonably believes that a risk of Material Adverse Deviation exists, the statutory opinion requires the appointed actuary to identify the standard in *all* opinions.

The Scope paragraph also requires a new substantive disclosure of the name, affiliation, and relation to the Company of the individual upon whom the appointed actuary relied for preparation of the data. This replaces the reference to reliance on "responsible officers and employees of the company."

Considered to be the most valuable information in the opinion, the revised Relevant Comments section provides the context for interpretation by the regulator, and understanding of the actuary's reasoning, judgment, and opinion. The most important relevant comment relates to the Risk of Material Adverse Deviation (RMAD). The actuary must *explicitly* state *whether* he or she reasonably believes there are significant risks and uncertainties that could result in material adverse deviation. This provides perspective for the regulator to interpret the actuary's judgment. The actuary is also required to comment on the basis for choosing this standard.

The final substantive change is the addition of requirements for the Actuarial Report's content. Both narrative and technical components are now required. The narrative section must provide clearly worded information so readers are able to appreciate the significance of the actuary's findings and conclusions, the uncertainty in the estimates, and differences between the actuary's estimates and the carried reserves. The Actuarial Report must also include an exhibit that ties to the Annual Statement and compares the Actuary's conclusions to the carried amounts. The technical section must show the analysis from the basic data, e.g., loss triangles, to the conclusions. The Report is considered a confidential document.

[The COPLFR Practice Note is being revised to provide actuaries with guidance as they prepare their first Opinions under the new format. Included with the Practice Note is a Guidance Note written by regulators, which we hope will be an annual feature of the Practice Note for years to come.] ■

25 Years Ago in *The Actuarial Review*

Substituting Terms

by Walter C. Wright

Following is an excerpt from Matthew Rodermund's November 1979 editorial focusing on a session at the CAS Spring Meeting that year. Change the words "age, sex, and marital status," to "credit history" and the debate is as fresh now as it was then. For the entire editorial, see www.casact.org/pubs/actrev/historic/nov79.pdf.

Cost Based Classification Criteria

We believe it is agreed by the technicians that a proper risk classification needs more than to be cost based. But many segments of the industry have resisted current efforts to eliminate age, sex, and marital status as classification definitions largely on the ground that such distinctions can be statistically proved to be valid. They are cost based. What has happened is that in my quarters the importance of the cost based concept has been broadened to embrace—and thus minimize—other considerations that the public regards as vital.

Certainly age, sex, and marital status meet Mr. [Michael] Fusco's standards of definiteness and practicality, but the insurance business has not yet established conclusively that those classifications meet the homogeneity criterion. There is a suspicion, moreover, that the agreed validity of the cost based criterion for age, sex, and marital status has discouraged the incentive for actuarial innovation that Ms. Bogue [Linda A. Bogue of the Stanford Research Institute] called for, and tends to sidestep her question on asymmetrical fairness, i.e., are good risks unreasonably overcharged?

The cost based concept is fundamental, but it ought not to be used as club to beat down other considerations. ■

Actuaries Abroad

Rain, Rain, Go Away

by Kendra M. Felisky-Watson

There is a theme to the column; let's see if you can guess what it is…(drip, drip, drip.)

This summer was one of the wettest summers on record here in the U.K., and those of you who are familiar with the typical "English summer" know how wet, grey, and cold it must have been! A month's worth of rain landed in a very scenic part of Cornwall one morning in August. Unfortunately, at Bocastle, a picturesque village at the confluence of several rivers leading to the sea, a wall of mud and debris swept through the village pretty much destroying everything in its path. Amazingly, no one had any serious injuries. Another mudslide happened in Scotland where part of a road on the side of the mountain disappeared in a huge bog of mud. This is in complete contrast to last August, which was the hottest and driest on record. Insurers were not too pleased with the dry summer last year as they had a huge increase in subsidence claims. This year there are flooding and mudslide problems. They can't win.

European reinsurers have been watching the developments of Hurricanes Charley, Frances, and Ivan with much interest. At the time of writing, Munich Re is estimating these hurricanes will cost them in the low hundreds of millions of U.S. dollars and Swiss Re is estimating $300 million.

Regulation of insurance companies is undergoing a change here in the U.K. The Financial Services Authority is implementing a risk-based capital regime, but they are doing it by making the insurers assess their own capital needs based on their own risk profile. The FSA also has a standard assessment calculation and insurers must explain the difference from this standard.

Another facet the FSA is investigating is the appropriateness of statutory actuarial reserve opinions. At the moment, on the property/casualty side, only Lloyd's syndicates are required to have actuarial opinions. The General Insurance Board of the Institute and Faculty of Actuaries set up a working party to investigate the role of actuaries in statutory certification of reserves. The working party intentionally took no stance in favor of any specific option but, instead, wrote a paper intended to promote debate, starting at GIRO 2004, that will help the profession formulate its position on this important topic. The paper identifies various issues that might be associated with a formal actuarial role within nonlife reserving. Some ways in which these issues could be used to argue both for and against the introduction of such a role are set out. The authors are not schizophrenic—this format is used merely to provoke thought amongst the readers about the various arguments. Therefore, there are some arguments or viewpoints put forward in this paper that none of the authors would support, but which they recognize "some might say." Whatever the arguments, the authors do not believe this is a "take it or leave it" matter. They feel that a formal role for actuaries within nonlife reserving could take many different forms, and that these should be considered before statutory actuarial involvement is either promoted or rejected. The paper is a very entertaining read and has some thought provoking observations about the possibilities regarding the extent of a statutory actuarial role. This working party is especially apropos in regard to the Morris enquiry into the actuarial profession in the U.K.

And to continue the rain theme, by the time you read this the annual conference of U.K actuaries (GIRO 2004) will have taken place in Killarney, Ireland, a place noted for its greenness due to…that wet stuff—rain. Or is it mold?

And then there is the Ryder Cup.... ■

Actuaries Wanted to Help Students Discover the Wonders of Mathematics

In the past, you may have been approached to volunteer for industry activities. Some of them have interested you more than others. However, today, you have the opportunity to get involved with a program in your area that could be the most rewarding volunteer opportunity of your career—serving as a mentor for kids. The Actuarial Foundation's ***Advancing Student Achievement (ASA)*** program is looking for actuarial mentors in communities all over the United States. For more information or to see if your town needs your help, please visit www.actuarialfoundation.org/youth/call_for_mentors.htm.

If you can spare a small amount of time to assist in a math-mentoring school program, please contact Debbie Scanlon, Project Administrator at the Actuarial Foundation at asa@actfnd.org or call her at (847) 706-3600. We hope you will consider mentoring a student today and make a difference in their future.

Editor's Note: *The Actuarial Foundation is a 501(c)(3) organization established in 1994 to help facilitate and broaden the actuarial profession's contribution to society. The Foundation's youth education initiative,* ***Advancing Student Achievement****, is one of its most successful initiatives serving its mission.* ■

Nonactuarial Pursuits of Casualty Actuaries

Airtime Thrills

by Marty Adler

Business travel may be regarded as a necessary inconvenience or an opportunity for entertainment and adventure. Moe Berg, an erudite Princeton graduate, enjoyed being a third-string catcher for a number of major league teams in the 1920s and 1930s because it allowed time for reading, dining, and adventure in various cities. One of our Fellows uses travel opportunities to experience the thrill of as many different roller coasters as he can ride. In May 1999, *USA Today* mentioned him in a feature article on business travel. A member of American Coaster Enthusiasts (ACE), for about ten years he has been counting the number of different roller coasters he has ridden. He is up to 170. He notes, however, that some members of ACE have ridden on 300 to 500 roller coasters. One benefit to ACE members is occasional special events that eliminate the long lines when parks agree to open early or stay open late.

His enchantment with roller coasters began early in life when an aunt sneaked him onto one at age four or five, long before he was big enough or old enough. His aunt was a very fun-loving person, as is he, so she didn't think twice about it. (He doesn't remember how his mother reacted, but doesn't think safety was a big concern then.) The next opportunity to ride roller coasters came at age seven when his family went to Six Flags over Texas.

Naturally this enthusiasm is not limited to business trips. The family often goes to amusement parks. All of his children—ages 19, 18, 17, 12, and 10—like roller coasters. He says that currently the 12- and 10-year olds are the most enthusiastic to ride with him, but that's probably because they aren't teenagers yet! The younger ones like them almost as much as he does and have started their own lists of coasters conquered. The zeal does not extend to his wife, however. She participates to the extent that she holds the coats. She's never had a stomach for roller coasters. She prefers what he calls the "barf rides" that spin riders around in circles. "I can't handle those," says our Fellow. "So I guess you could say when it comes to amusement parks, we are incompatible." However, his wife has pointed out that staying back from riding the coasters can be quite a good thing, as it is a built in break from being a wife and mother of five.

"His enchantment with roller coasters began early in life when an aunt sneaked him onto one at age four or five, long before he was big enough or old enough."

Our Fellow loves both the wooden and the contemporary steel roller coasters. His favorite wooden coaster is Shivering Timbers in Michigan's Adventure, Muskegon. In a little out of the way amusement park, this one is a "hands-down winner" to him for its classic design and mega airtime. "Airtime," or negative Gs, is the sensation roller coaster riders have of floating above their seats. His other favorite wood coasters are The Beast in Kings Island, Cincinnati; Thunderhawk in Dollywood, Pigeon Forge, Tennessee; and Ghost Rider in Knotts Berry Farm, Buena Park, California. For steel coasters, his number one is Top Thrill Dragster in Cedar Point, Ohio. This was new last year, and it's at the top of his list for the sheer speed and thrill. It goes 0-120 mph in four seconds, then climbs a 420 ft. vertical tower at 90 degrees, gives a jolt of airtime as the train goes over the top, then comes down at a 90 degree angle to the ground in a corkscrew fashion. "Quite a rush," he says. (I don't doubt that.) He also likes Millennium Force at Cedar Point (over 300 feet tall and a more traditional roller coaster circuit); Rock'n Roller Coaster at MGM Studios, Disney World, more for the theming than the ride; Volcano-The Blast Coaster in King's Dominion, Virginia; and Superman at Six Flags America in Maryland. He is not a fan of the upside-down craze that steel coaster makers went through about 10-15 years ago. He prefers sheer speed and airtime.

A few rides are designated as "Coaster Classics" by ACE. The strict requirements include (1) traditional lap bars that allow riders to experience airtime, (2) absence of any restraint or device that restricts the freedom to slide from side-to-side, and (3) absence of headrests because they restrict the ability to view the upcoming drops and thrills. During one of his business trips, our Fellow, who is 6'7", rode the Cyclone at Coney Island, one of ACE's Coaster Classics. Although he usually feels exuberance after riding a coaster, after riding this one he had back pain, bruised knees, and a substantial headache. At least in this case, he is glad they don't make them like they used to!

Jim Rowland notes that safety has never been a concern of his. He claims roller coasters are much safer than driving a car on the road. He wonders if there are any actuarial studies on injury frequencies per million—automobiles vs. airplanes vs. roller coasters?

Jim is a senior actuary and product manager for Allstate Insurance Company in Northbrook, Illinois. He is currently chairperson of the Committee on the Ratemaking Seminar. ■

There's No Holding Back the Committee on Reserves

by J. Michael Boa, Manager, Communications and Research

Although your CAS acronym dictionary is already over-flowing, here are a few new entries: CORTFOP (kôrt´fahp). URIL (ûrl). CASCOR (kas´kôr).

These additions to the CAS lexicon are courtesy of the CAS Committee on Reserves, or CASCOR for short. This research committee is charged with addressing actuarial issues related to reserves associated with property and casualty exposures, including loss and loss adjustment expense reserves, premium reserves and other contingent reserves. To accomplish this, Chairperson **Jon Michelson** has divvied up the Committee into subgroups, which are not only the source of the new acronyms, but also of much hard work. Here is a closer look at a few of the CASCOR subgroups and the work they are doing on behalf of the casualty actuarial profession.

Reconciliation Guidance Subgroup

This subgroup was formed in response to concerns regarding reconciliations performed in support of the opining actuary's Statement of Actuarial Opinion. Its primary goal was to enhance the existing guidance for these reconciliations in an effort to improve their overall quality and consistency. The subgroup focused on Appendix 1 (Evaluation and Reconciliation of Data) of the American Academy of Actuaries Committee on Property and Liability Financial Reporting (COPLFR) Practice Note to evaluate the current guidance provided therein and to determine whether it could be enhanced in an effort to achieve its goals. The subgroup recently submitted suggested modifications to the Practice Note for COPLFR's consideration. Each suggestion included a detailed explanation of the reasons for the proposed change. Led by **Gloria Huberman,** this subgroup includes **Rick Burt, Jeff Carlson, Steve Herman,** and **Warren Johnson**.

"Here is a closer look at a few of the CASCOR subgroups and the work they are doing on behalf of the casualty actuarial profession."

Under-Reserving/ Insolvency Link (URIL)

URIL was formed to investigate and report on the impact of inadequate reserves on recent property/casualty company insolvencies as well as to review the cause of recent reserve increases taken by ongoing companies. This subgroup's work is currently proceeding on two fronts. Project 1 involves an examination of Statements of Actuarial Opinions (SAO) from insolvent companies (1990-2000) and ongoing companies with large reserve changes (2000-2003). The subgroup is attempting to measure the quality of information in SAOs relative to company performance. For example, were there problems identified in the SAO prior to a company's insolvency or reserve movement? The data gathered about these companies will be compared to statistics from the universe of SAOs in order to draw conclusions. Project 2 will examine the reserving process for ongoing companies with recent large reserve changes. The goal of this project is to rigorously examine the reserve methods and identify any problem areas such as assumptions, methods, or selections. The subgroup is planning to use independent researchers to protect the confidentiality of the companies, and a request for proposals to do that work is under development. Progress on both of these projects will be the focus of a concurrent session at the 2004 CAS Annual Meeting. This subgroup is being directed by CASCOR Vice Chair **Tom Ryan**, and includes **Jeff Guttman**, **Aaron Halpert**, Gloria Huberman, **Stan Khury,** and Jon Michelson. **Sarah Fore** is rotating off the subgroup but was extremely valuable in completing the initial research performed by the subgroup.

Committee on Reserves Task Force on Principles (CORTFOP)

CORTFOP has been charged with the painstaking task of updating the 1988 CAS Statement of Principles Regarding Property and Casualty Loss and Loss Adjustment Expense Reserves. The group has been working on this for a couple of years and recently presented a draft to the full committee. The updated version of the Principles will eventually be released to the CAS membership as a discussion draft for review and comment. The group is chaired by **Bert Horowitz** and includes Aaron Halpert, Jon Michelson, **Toni Mulder, Dale Ogden, David Powell, Debbie Rosenberg,** and **Rodney Kreps**.

Reserves Working Parties

CASCOR recently formed two new research working parties. The

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Election

From page 1

the 2002 election.

Braithwaite has served the CAS in many capacities since becoming a Fellow in 1983. He was a member of the CAS Board of Directors from 1997 to 2000 and Executive Council Vice President-Administration from 1994 to 1997. He has chaired the Audit Committee, the Joint Committee for CLRS Seminar, and the Financial Analysis Committee. He served as CAS Assistant Secretary from 1991 to 1993 and was a member of numerous committees, including the Examination Committee.

Members also elected **Regina Berens, Christopher S. Carlson, Allan Kaufman,** and **Karen F. Terry** to the board. They succeed **Phillip N. Ben-Zvi, Curtis Gary Dean, David G. Hartman,** and **Janet R. Nelson.**

At their meeting in September, the board elected **Amy S. Bouska** as vice president-international and **Beth E. Fitzgerald** as vice president-professional education. Bouska and Fitzgerald succeed **John C. Narvell** and **Christopher S. Carlson**, respectively, who have both completed three-year terms. The board re-elected all incumbent vice presidents, including **Deborah M. Rosenberg,** administration; **Thomas G. Myers**, admissions; **Joanne S. Spalla**, marketing and communications; and **Donald F. Mango**, research and development.

Members of the 2004 Nominating Committee are Chairperson **Robert F. Conger, Ann M. Conway, Doreen S. Faga, Anne E. Kelly, Dale S. Porfilio, Gail M. Ross,** and **Julia Causbie Stenberg.** ■

Election Results

According to the 2002 election procedures approved by the CAS Board, all vote counts are released to the membership.

President Elect	
Candidate	**Votes**
Paul Braithwaite	1,011
Total	**1,011**

Directors	
Candidate	**Votes**
Regina Berens	662
Christopher S. Carlson	572
Allan Kaufman	547
Karen F. Terry	516
Chester J. Szczepanski	478
Eugene C. Connell	414
John Narvell	406
Clive L. Keatinge	339

Latest Research

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Bornhuetter-Ferguson: Initial Expected Losses Working Party, co-chaired by Jeff Carlson and **Chris Olson**, is aiming to produce a paper regarding the initial expected loss assumption in the Bornhetter-Ferguson reserving method. The goal of the Tail Factors Working Party is to produce a paper that will survey existing literature on the topic and then identify additional methods in use. This working party is co-chaired by **Tony Phillips** and **Steve Herman**.

Based on the results of the last CASCOR meeting, more subgroups are on the way. The committee brainstormed potential goals for 2005 and settled on reserve reasonableness testing as an area of focus. In addition, the committee plans to begin utilizing the CAS Web Site to initiate focused discussions to facilitate increased sharing of information and ideas on reserving issues.

More details about the Committee on Reserves are available through its page on the CAS Web Site at www.casact.org/cor/reserves.htm. ■

GSU Faculty Positions Available in Actuarial Science/Mathematical Finance

Georgia State University's J. Mack Robinson College of Business has two openings in its department of Risk Management and Insurance. GSU invites applications for two tenure-track positions at the assistant professor level (entry-to-experienced) to begin in fall 2005. Salaries will be competitive and appropriate research support and funds will be provided. Teaching loads will be commensurate with the highest research expectations to ensure that the group has the opportunity to publish in the major journals of economics, finance, and actuarial science.

Two faculty members are sought with interests in actuarial science, financial risk management, and/or financial econometrics. Qualified candidates will have a completed Ph.D. in actuarial science, economics, finance, mathematics, statistics, or related field by the time of their appointment. Preference will be given to those who are members in a professional actuarial organization or who are willing to attain professional accreditation.

For further information, contact the chair of the search committee. Applicants should send a CV, a statement of research interests and teaching experience, three letters of recommendation, and recent publications or working papers to: Richard D. Phillips, Chair, Search Committee, Department of Risk Management and Insurance, Robinson College of Business, P.O. Box 4036, Atlanta, GA 30302-4036; (404) 651-3397. Applicants are strongly encouraged to submit their materials electronically via e-mail to rmijob@gsu.edu. Interviews can be scheduled for the 2005 Allied Social Sciences Association Annual Meeting in Philadelphia, the 2004 SOA Annual Meeting in New York City, the 2004 CAS Annual Meeting in Montréal, or the 2004 International AFIR Colloquium in Boston. Preference will be given to applications received by December 1, 2004. [EOE/AAE] ■

Focus on International Research

The British Take on Fair Value

***The Implication of Fair Value Accounting for General Insurance Companies* by P. K. Clark, P. H. Hinton, E. J. Nicholson, L. Storey, G. G. Wells, and M. G. White, *British Actuarial Journal*, 9, V, 1007-1059 (2003).**

Reviewed by Philip E. Heckman

Editor's Note: In the August 2004 issue of The Actuarial Review, ***Phil Heckman*** *focused on fair value accounting in an opinion piece. For this issue he reviews how the British interpret fair value accounting.*

This paper was originally presented by a Working Party (WP) of the General Insurance Research Organisation (GIRO) in October 2002. It has since been updated through February 2003 and presented to the Institute of Actuaries (IA) on March 24, 2003. (For the entire text of the article, see the "Research" section of the CAS Web Site.) Besides being interesting and informative, it offers the reader a veritable festival of acronyms. It is not, however, a quantitative study like those recently commissioned by the CAS, which look at the effect of fair value prescriptions on realistic reserve numbers.

The fair value accounting initiative now being spearheaded by the International Accounting Standards Board (IASB) is aimed at ensuring, to the extent possible, that the assets and liabilities appearing on an enterprise balance sheet carry values that can be realized if assets are sold or liabilities ceded in the open market. Thus assets should be recorded at values acceptable as asset prices, and liabilities at values acceptable to a guarantor agreeing to take over the obligation—an extremely important distinction.

The authors point out that IASB has tabled its attempt to publish a comprehensive standard for financial instruments, leaving this area much as it was and shifting focus to insurance contracts.

The paper explores the implications of the Draft Statement of Principles (DSOP), first exposed for discussion in November 2001. Not much has happened in the meantime. The most significant intervening event is the IASB's issuance, on March 31, 2004 with a January 1, 2005 effective date, of IFRS 4, which contains no material surprises. Among the issues raised in the DSOP are:

1. Reconfiguration of accounts. As a consequence of the fair valuation paradigm, reporting will be on the basis of closed cohorts of contracts. This has the effect of eliminating unearned premium reserves and deferred acquisition costs.
2. A strong preference for stochastic reserving methods over deterministic methods.
3. And, closely tied to 2 above, a strong insistence that loss reserves be reported with Market Value Margins (MVMs), a concept very close to the actuarial one of risk load. IASB has decreed that the MVM reflect both diversifiable and systematic risk. All in all, both the GIRO WP and their IA discussants regard these as very muddy waters indeed and make their perplexity very clear.
4. Entity specific value. This is a somewhat elusive concept. When direct market information is unavailable for valuation purposes, fair value dictates using information for a typical market player. Entity-specific value allows use of the company's own information. For general insurance (P&C), this boils down to some technical points in the evaluation of MVMs.

The WP discusses these issues at some length and in detail, producing a fairly comprehensive catalog of problems and concerns. The overall impression is that insurance fair value is no closer to prime time than financial institutions fair value.

Comments

Several underlying issues impede the adoption of fair value for insurance contracts. The first is that the accounting community does not understand liability valuation in sufficient depth to get it right. Prime evidence is the issue of reflecting one's credit standing in liability valuations and prevailing confusion regarding the role of the guarantor. This has deep roots in traditional practice but is puzzling to anyone who values liabilities for a living. For details, I refer the reader to my paper published in *NAAJ*, January 2004.

The issue of Market Value Margins also betrays confusion as to the role of the guarantor. A guarantor will seek to assemble a diversified portfolio of guarantees and face a risk dominated by market systematics, not individual company volatility. Stochastic loss models will not be useful in quantifying this effect until they are capable of measuring market risk. I know of no models in such a state of development. Many have not yet adopted a realistic probability measure.

Conclusion

The working party is to be commended for a thorough and insightful presentation of the issues. The IA discussion was also timely and illuminating. Fair value implementation has not been, and will not be, a smooth process. In my own opinion, many of the issues that must be resolved are general accounting issues and involve insurance only incidentally. Actuaries should be wary of calls to surrender their intuition in the name of accounting uniformity. Actuarial intuition in liability valuation has had longer to develop and is arguably more reliable than that of accountants, for whom valuation is a new thing. ■

who are self-employed, or for those whose employers are unusually understanding. The large time commitment greatly limits the pool of people who otherwise would make good leaders.

Perhaps the CAS needs an ambassador, a prime minister, or a chief poobah? Basically someone, or several someones, who carry out certain duties now held by the president, freeing the president to do more long-range planning for the Society. What a wonderful development! With a time commitment more in line with work-related needs, more qualified candidates would present themselves to run for the office. It would be nice to vote for one of *several* choices.

And so for my opinion (drum roll please)! **I recommend that the CAS set up a task force to study the president's time commitments and to see if some commitments can be met by others.** That's it—but that's a pretty large task!

I hope no one misunderstands me. I am very much pleased with our current and previous presidents! If asked to vote for each one again, in a one-person election, I would certainly do so (in preference to a write-in vote for the dog)! A real vote, though, implies a choice. Otherwise, we can simply elect an additional person to the board and have the board choose someone from their midst. At least they would have about a dozen choices, which is about eleven more than I have….

Can the CAS and SOA cooperate by offering a joint designation?

Can another actuarial organization, such as the SOA, the Faculty of Actuaries in England, or the Institute of Actuaries in Australia, offer an education in non-life contingencies as good as the CAS? If the SOA can offer an optional exam path in life, health, pensions, or finance, can they offer an exam path in non-life contingencies? Taking it a step further, can any of these actuarial organizations use the same study materials as the CAS has developed? The answer to these questions is a resounding "Yes!" Knowledge, especially in the Internet-based world, is increasingly transferable and increasingly available.

The syllabus of every actuarial organization outside the United States and Canada includes a non-life component. All that such an organization needs to offer is one exam on basic aspects of non-life ratemaking, reserving, and reinsurance; and another exam on advanced topics of non-life ratemaking, reserving, and reinsurance; and their actuaries would receive an education pretty comparable to that of the CAS. Of course they would lack an understanding of our accounting, laws, and regulatory structure, but they may attain a mastery of those through additional self-study.

"Now that the CAS is signing Mutual Recognition (MR) agreements with some of these international organizations, the likelihood that a new student from a foreign country would choose to take CAS exams is very low."

In the United States and Canada, the designation I receive from the CAS or SOA allows me to practice on only one "side of the house" (in life or non-life contingencies). Yet a designation in any other country in the world allows me to practice on both "sides of the house." Now that the CAS is signing Mutual Recognition (MR) agreements with some of these international organizations, the likelihood that a new student from a foreign country would choose to take CAS exams is very low. It makes more sense for that new student to take the FIA or IAAust exams. They can then practice on either side of the house in their own country, and, if they come to the United States or Canada, they can obtain their Fellow designation by Mutual Recognition. There is no rational reason for a foreign student to limit their future employment opportunities by taking the CAS or SOA exams.

I propose a new designation: FRC, Fellow in Risk Contingencies. An FRC is someone who has passed some exams from each Society, and who would be qualified, in the eyes of both Societies, to sign actuarial Statements of Opinion.

Let's consider the advantages of this suggestion:

1. The FRC could practice on both sides of the house in the United States and Canada. Therefore it would be attractive to those who want a designation comparable to a foreign Fellow.
2. The FRC has an incentive to pursue just a few additional exams to get an FCAS or an FSA.
3. The value of the current designations (FCAS, ACAS, FSA, and ASA) is preserved. There would be no confusion as to the meaning of the FRC versus any of the current four designations.
4. The new designation allows the CAS and the SOA to offer an exam path to foreign students that is more attractive than the FIA, because they can practice on both sides of the house if they later move to North America. The foreign student does not have to obtain a designation by MR; that student is already qualified!
5. The new designation does not require the CAS or the SOA to create any new exams. Indeed we can build on the joint exams so that the FRC only has to take a few more exams (beyond the three joint exams) from each society. The travel time could be set at a level so that it's comparable to the travel time of a foreign Fellow.
6. The new designation eliminates or minimizes the possibility that the SOA would create its own non-life exam track.
7. The FRC would be a blockbuster designation with immediate world-

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CAS Honors Members Going "Above and Beyond Achievement"

The Above and Beyond Achievement Award (ABAA) celebrates the spirit of volunteerism by recognizing one or more CAS members each year who have made recent contributions that are conspicuously above and beyond what is normally and reasonably expected.

The CAS awarded the 2004 ABAA to **Ralph S. Blanchard III, Kevin G. Dickson** and, posthumously, to **Stuart Suchoff.**

Ralph Blanchard is recognized for his work heading up the IAA Response Coordination Committee, which reviews International Actuarial Association (IAA) statements and recommends actions to the CAS Board of Directors. Blanchard also organized and oversaw the fair value research project, which culminated in the publication *Fair Value of P&C Liabilities: Practical Implications*. Blanchard's work included reviewing RFPs, notifying the proposal winners, tracking progress, reviewing drafts, and arranging presentations to the Financial Accounting Standards Board and the Governmental Accounting Standards Board.

Kevin Dickson is acknowledged for his work as a member of the CAS Enterprise Risk Management Committee. Dickson took the lead in setting up the program and logistics for the 2004 ERM Symposium, held this spring in Chicago. Dickson's work was particularly challenging as the symposium was moved up three months earlier than previously scheduled. Dickson also coordinated the efforts of the other sponsoring organizations: Society of Actuaries, Professional Risk Managers' International Association, and Georgia State University's Bowles Symposium. Dickson personally recruited several speakers and resolved different organizational approaches to logistics. That the ERM Symposium was a tremendous success was due in large part to Dickson's efforts.

Stuart Suchoff is honored for his numerous contributions to the CAS as well as his leadership on an American Academy of Actuaries (AAA) task force. Suchoff served on several CAS committees, including as member, vice chair, and chair of the CAS Program Planning Committee. He served on the External Communications Committee and was chair of the Reserves Committees. He was also a University Liaison. Most recently, Suchoff became chair of the AAA Risk-Based Capital Task Force, despite his contention that the topic was out of his "comfort zone." Suchoff accepted the challenge to provide leadership to the group. One person nominating Suchoff wrote: "His dedication, focus, and clear vision of what needed to be done and how to go about doing it made it a pleasure to work with him and for him." Suchoff died August 5, 2004.

The ABAAs will be presented at the CAS Annual Meeting this month. ■

Contributors Sought for Articles in Trade Publications

The CAS Media Relations Committee is charged with working through the media to enhance the external visibility of casualty actuaries. One of the committee's goals is to recruit CAS members to be contributors to the trade press. When CAS members write articles appearing in the media, they help to improve the public perception of the casualty actuarial profession, and promote the understanding of issues of concern to actuaries and our audiences.

The contributors are not speaking on behalf of the CAS or the actuarial profession. Contributors are interested professionals whose credentials as actuaries offer a specific perspective on events or issues in their industry. The Media Relations Committee will assist with the placement of submissions, but authors may have to expend some effort to get it published. The committee is also available to provide peer review of submissions, if desired.

Contributions could be in the form of opinion pieces or informational articles. Several topics have been identified for potential articles in trade publications, but contributions are not limited to these topics. Suggested topics include TRIA, credit scoring, hurricanes/mega events, and home valuation.

If you are interested in contributing an article to an industry trade publication or would like more information about this opportunity, please contact Mike Boa, Manager, Communications and Research, at the CAS Office [(703) 276-3100 or mboa@casact.org]. ■

In My Opinion

From page 22

wide acceptance because it would be offered by both key North American actuarial organizations. **It would carry unquestioned and exceptional international prestige.**

8. The FRC would fill a gap for SOA students desiring a possible future practice in the non-life field and fill a gap for CAS students desiring a possible future practice in the life, health, and pensions fields.
9. The FRC would allow the CAS to draw on the SOA's existing resources internationally (exam centers, testing methods, and other resources) rather than trying to build a competing international network ourselves.
10. As the lines between life and non-life insurers blur, the ability to practice on both sides of the house will become more important. This will be one effect of a) the Gramm-Leach-Bliley Act, and b) increasing internationalism with foreign insurers that handle both types of risk.
11. Employers may favor someone who can practice in multiple business units as the line between life and non-life insurers blurs.
12. The new designation would be a natural future designation to swap for a foreign Fellow's designation. For example, FIA for FRC or vice versa.

The new FRC designation would require unprecedented cooperation between the CAS and SOA to keep the travel time about the same as that of obtaining a Fellow from the Faculty of Actuaries in England or the Institute of Actuaries in Australia.

The paradigm of the FRC is that of two neighboring colleges, each with complementary course offerings, choosing to offer a joint degree. Some courses would be taken at one school and some courses at the other school, recognizing each school's unique expertise and resources.

This arrangement is rather common today. Most colleges offer credit for course work taken at other accredited colleges. Most colleges, especially those in the same geographic area, offer credit for certain courses that they do not offer, yet which round out a student's knowledge. In this light, the CAS "course offerings" nicely complement the SOA "course offerings," and vice versa!

I hope no one misunderstands me. I do not recommend a merger of the CAS and SOA! Nor is my proposal intended to be a step along that path! Rather, in a global world, I think it makes increasingly more sense for a North American designation that would allow the holder thereof to practice on both sides of the house, just as can be done in any foreign country. My proposal is intended to respect the unique resources and expertise of each organization.

The SOA *already* offers some non-life contingencies on their syllabus. What if they expanded that to a complete exam path? Would the CAS respond by offering a life exam path? There would be more gained through cooperation.

The new FRC designation is a natural evolution that does not diminish the value of any current designation, but draws on the strength of each organization's expertise. I predict current students in the United States and Canada who are forced to make a difficult choice today would receive the new designation with enthusiasm. **I recommend that the CAS set up a joint task force with the SOA, to explore this concept. Both societies would benefit.**

The two issues described above are among the more important issues facing the CAS today. Whether my opinions prompt you to say "Aye, Mate!" or "No way, Jose!" please feel free to send your thoughts on these topics to AR@casact.org. Thank you; we all gain from a thoughtful discussion! ■

CORP-Accepted Papers Posted on Web

The CAS Committee on Review of Papers has released its quarterly update of recently accepted papers. The CAS Editorial Committee will be editing these papers for inclusion in the *Proceedings of the Casualty Actuarial Society*. As of October 7, 2004, CORP has accepted the following papers:

1. Discussion by **Clive L. Keatinge** of "Minimum Distance Estimation of Loss Distributions" by Stuart A. Klugman and A. Rahulji Parsa;
2. "Simpson's Paradox, Confounding Variables, and Insurance Ratemaking" by **John A. Stenmark** and **Cheng-sheng Peter Wu;**
3. Author **David L. Ruhm**'s Response to **Michael Wacek**'s Discussion of "Distribution-Based Pricing Formulas Are Not Arbitrage-Free." ■

Keep Our Records Current!

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Mail in the address update card in your 2004 *Yearbook* or log on to the CAS Web Site at http://www.casact.org/members/private/changeform.cfm to update your records electronically.

All changes must be received by **December 1** in order to be reflected in the 2005 *Yearbook*. ■

Meaningful Ranges for Reserves

by Victoria Grossack

Actuaries have discussed much in recent years about what a best estimate should look like, but given less thought, perhaps, to what it means to have a meaningful range. Part of the problem is that we first need to ask—meaningful to whom? Auditors, regulators, management, mathematicians and even the general public have very different ideas about how to interpret a range. This article discusses different possible understandings of ranges and gives advice on how to speak about them.

Every actuary reading this article knows that actuarial science is an inexact science, attempting as it does to predict the future. Although a point must be selected in order to create the balance sheet and the income statement, it is unlikely that the final amount paid will be the number booked. So, in order to give some understanding to the variability, people often refer to reasonable ranges. Even now, though, we may find that we are using the same term with widely different meanings. What is a reasonable range? Here are some perspectives, all of which may change according to the speaker or the listener.

1. All possible outcomes perspective

A reasonable range goes from the lowest *possible* outcome and the highest *possible* outcome.

This definition may seem naïve, but there is logic to it and it may be the definition most accepted by the general population. A range would be *unreasonable* if it did not contain the final result, so for a range to be reasonable it must go from the least possible to the highest possible.

2. All probable outcomes perspective

A reasonable range goes from the lowest probable outcome to the highest probable outcome and the point chosen should be the most likely.

Here we may run into trouble into the definition of probable, as well as most likely, with many articles already published on the subject.

3. Mathematical view perspective

Given some underlying assumptions on the underlying probability distribution, a point can be chosen as the mean, and a range can be created as a confidence interval around the mean.

"I have no one-size-fits-all solution, except that the reserving actuary should take care when using the word 'range.'"

This definition looks good until one starts poking too hard at the underlying assumptions. How accurate is the selected probability model? How certain is that tail factor? Are the residuals to the fitted distribution behaving normally? Also, who decides what level of accuracy is important for the confidence interval? With this interpretation of the meaningful range, a wider range implies more uncertainty.

4. Management view perspective

A reasonable range means that we can book anywhere we like within it and still be reasonable, with the proviso that the next estimate provided by the actuarial department will give us the same flexibility, and the reserves should never show adverse development in the future.

5. Auditor view perspective

A reasonable range is the difference we will allow between our estimate and the number booked by the client. It may be +/- 5%, with some allowance for the uncertainty of a line of business.

Notice that perspectives 1, 2 and 3 are concerned with calculation and measurement, whereas perspectives 4 and 5 are concerned with actions that can be taken as a result of the numbers. And the perspective may change as the phrase "meaningful range" or "reasonable range" is used by different people. In fact, the perspective may change as these phrases are used by the same person, *without the speaker even realizing it*.

So, what is the reserving actuary to do?

I have no one-size-fits-all solution, except that the reserving actuary should take care when using the word "range." The actuary should check—in advance, if possible—what the primary user believes about ranges, and if there is a company policy on how ranges are applied. If not, the actuary should make recommendations on how the range can be used while delivering them. The actuary may especially want to emphasize how the range should not be used.

Ranges are in demand these days, especially with the regulatory changes in the U.S. (Sarbanes-Oxley) and Europe (International Financial Reporting Standards). Nevertheless, despite the demands for ranges, those requesting them often ignore them in the end. Dealing with ranges increases the level of complexity considerably, and many people are either math-phobic or they have more important things to work on besides understanding the various interpretations of ranges.

There may never be total consensus on the definition and interpretation of "meaningful range." And that's as it should be, as a meaningful range should reflect what is meaningful for the decision maker given that decision maker's needs and capabilities. However, a meaningful range should also consider the users of that range and the degree to which they may rely on the range being reasonable. ■

www.casact.org

Announcing General Business Skills Resource and CAS WebNews

by Tiffany Luhring, CAS Web Site Developer

New Business Skills Resource

The Committee on General Business Skills Education (GBSEC) introduces the Business Skills Online Publication Resource database. This online tool is a searchable database of resources related to the acquisition and development of general business skills. The database is populated with recommendations that are reviewed and approved by the GBSEC. To begin searching the Business Skills Online Publication Resource database or to recommend a resource, visit www.casact.org/pubs/gbse/.

Find Out What's New @ casact.org

CAS Web Site visitors are invited to sign up for the CAS WebNews e-mail list to be informed of updates and new additions to the Web site. Only those who subscribe to this list will be sent these periodic messages. Enter your e-mail address in the box at the bottom of the CAS homepage to subscribe.

The Missing Links

Just a reminder as you pay your 2005 CAS dues—electing to receive the CAS *Forum* and *Discussion Paper Programs* electronically yields a savings of $45. All CAS publications are found in the "Publications" section of the CAS Web Site in pdf format and can be downloaded and printed. ■

Congratulations on a Novel Accomplishment!

Congratulations to **Victoria Grossack** and **Alice Underwood** on the publication of their first novel, *Iokaste: The Novel of the Mother-Wife of Oedipus*! Iokaste, often spelled Jocasta, was the Queen of Thebes who was both wife and mother to Oedipus. This story has always been told from *his* point of view, but in this book Iokaste tells *her* story.

Iokaste is the first book in Grossack and Underwood's Tapestry of Bronze series based on Greek myths in "the time of heroes" during the Late Bronze Age. (You can find out more at www.tapestryofbronze.com.) Published by Publish America, the novel is available from Amazon.com and Barnes & Noble.

"This is a real page-turner!…[It is] a smart and delightful book, economically told and well worth any reader's precious time," says Bob Mielke, Professor of English at Truman State University, in his enthusiastic review of *Iokaste.*

But why take the word of a literary expert? Readers of The *Actuarial Review* surely would find an *actuary's* review of the book more credible. Send us an e-mail by December 3 that explains, in 50 words or less, why *you* have the best and most appropriate qualifications, actuarial or otherwise, to review *Iokaste* in *The Actuarial Review*. The winner will be selected by the staff of *The Actuarial Review*, whose decision shall be final. If you are selected, you will receive a copy of *Iokaste* signed by Victoria Grossack and Alice Underwood! ■

CAS Professional Education Calendar

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

Nov 14-17 CAS Annual Meeting, Fairmont The Queen Elizabeth, Montréal Québec, Canada	**Mar 10-11, 2005** Ratemaking Seminar New Orleans, LA New Orleans Marriott	**May 1-3, 2005** ERM Symposium Sheraton Downtown Chicago Chicago, IL	**May 15-18, 2005** CAS Spring Meeting Phoenix, AZ Pointe Hilton South Mountain Resort
Jun 6-7, 2005 Seminar on Reinsurance Fairmont Southampton Hamilton, Bermuda	**Sep 12-13, 2005** Casualty Loss Reserve Seminar The Boston Park Plaza Hotel Boston, MA	**Sep 26, 2005** Seminar on Reinsurance* New York Marriott East Side New York, NY	**Nov 13-16, 2005** CAS Annual Meeting Renaissance Harborplace Baltimore, MD
Jun 17-20, 2007 2007 CAS Spring Meeting Contemporary Resort at Walt Disney World Orlando, FL	**Jun 19-22, 2007** ASTIN Colloquium and 50th Anniversary Celebration Contemporary Resort at Walt Disney World Orlando, FL		

* Limited Attendance
† For calendar of events updates, visit www.casact.org.

Tales of Examinations

A Friend Indeed

by Rodrigo Silva

I live in Colombia and here only very few actuaries are available. Some of them had passed exams in the old exam system many years ago. Therefore, the process of preparing for the exams for me had been a lonely one. Given the syllabus changing from time to time and the new approach, I didn't find anyone in Columbia to ask questions. For all the sittings I had been the only one taking the exam. There's no way that I can miss the big clock on the exam's day—it's just a couple meters from my eyes.

The day of my last sitting was a holiday in Colombia and the building where I would take the exam would be closed that day! What to do? Should I wait another six months? I e-mailed the CAS coordinator and she told me that I should seek someone who could help me that day. I couldn't manage to contact a local actuary in time, and a few institutes that help to prepare exams like TOEFL and GRE knew something about the SOA and CAS exams but were not willing to administer the exam. My third chance was a university professor. More than one colleague of mine had been much more judicious than me and became a Ph.D. and enrolled full time at our university. But only a friend is able to sacrifice a morning for you instead of spending this precious time with his wife and children. I talked with my professor-friend and with great surprise he was supportive. I told him what I was asking for: to sit with me in a room in the morning of a day off instead of sleeping a few hours more! The process from that point was straightforward: I e-mailed the CAS coordinator and it was very easy. The day of the exam was normal one. I sat for four hours and I used all the scratch paper I could in order to answer the questions. Fortunately, all of this was not wasted time: I passed the exam and I recovered. As for my professor-friend, even his wife doesn't hate me—at least that is what *he* says. ■

Tales of Examinations—Tell Us Your Stories

Do you have a humorous story or anecdote about taking the CAS exams? This can cover such areas as studying for exams, taking seminars (including instructors and classmates), things that happened on the day of the exam, or exam study partners. If you do (we *know* you do!), please send your story to **Arthur J. Schwartz** at aschwart@ncdoi.net. Arthur will compile your stories (taking care to protect the innocent!) and publish them, for our mutual enjoyment, in a future issue of *The Actuarial Review*. ■

Humor Me

by Michael Ersevim

Actuarial Bumper Stickers

STUDYING: THE ANTI-DRUG

IF A GEEK DOESN'T KNOW THE ANSWER, ASK AN ACTUARY

Actuaries—more than just a pretty face

Hey, nice shoes!

KISS ME, I'M AN ACTUARY!

Honk if your accident frequency is determined by a Poisson process!

Is that a BA-35 in your pocket or do you have good news about the reserves?

Mike's All-Lines Credibility-Weighting Procedure for Class Rate Revision Filings:

Preconceived notion as to the answer	30%
Answer your boss expects to see	23%
Answer from the flawed spreadsheet	15%
Answer the regulators will approve	13%
Last year's answer	9%
Nearest integer to your initial indication	6%
An extra 5% for "good-luck"	4%

Editor's Note: For more of the best in actuarial humor, check out ***Jerome Tuttle's*** *Web site actuarialjokes.com.*

An X-Ray for Risk

by David L. Ruhm

In this article, a method will be described that measures the contributions to risk (adverse scenarios) from business segments, lines, and large individual contracts. The method is analogous to an x-ray because, once risk scenarios are identified at the total-company level, a simple technique is applied to examine each of the company's parts (lines, segments or even large individual contracts), revealing where risk is residing and how much is present in each area.

This method is based on the philosophy that the company's total results are the most meaningful basis for the measurement of risk. Line level risk measurements are less meaningful since they effectively treat each line as if it were written on a stand-alone basis, which does not account for correlation and diversification effects. Also, all lines are not equal when viewed through the total company perspective: a 1-in-100-years event in a larger, catastrophe-exposed line can have more impact on the company's financial condition than a 1-in-100-years event in a smaller, less volatile line.

The concept that total-company results are the ideal basis for defining risk has intuitive appeal, but there have been difficult technical problems with modeling and measuring risk across several segments, and also with attributing such a risk measurement down to individual lines in an accurate manner. The first problem is starting to give way, through recent advances in modeling and computing power. The method described in this article addresses the second problem.

The Method

The risk x-ray is simply a weighted average of possible outcomes, where the weights are a function of total-company results. More severe outcomes receive greater weight. The risk x-ray method is as follows:

1. Start with a table of potential outcome scenarios for the total company's results and for the lines of business being analyzed (see the table below for an example).

2. Identify those particular scenarios that define risk for the company, from the viewpoint of company management. The risk definition will be based on a measure of total-company results, such as net income or change in equity.

3. Assign non-negative weights to each outcome scenario, reflecting the degree of risk associated with each outcome. Assign higher weights to the risk-scenarios identified in Step 2, based on their severity and the secondary consequences that can be expected. For example, a ten million dollar loss scenario that would also destroy future business opportunities worth five million dollars would receive a weight of 1.50, reflecting the lost opportunities' value in addition to the direct loss amount. Some judgment will be necessary, since these secondary impacts are usually difficult to forecast precisely.

4. Multiply each scenario's weight from Step 3 by the scenario's probability. This produces the "risk x-ray vector."

5. To determine any line's contribution to total-company risk scenarios, calculate the line's expected value using the x-ray vector in place of probabilities. In spreadsheet terms, take the "sum-product" of the line's net outcomes with the x-ray vector, across all scenarios. A positive value shows that, overall, the line provides relief in risk scenarios (it probably helps in some scenarios and adds to risk in others), while a negative value shows that the line is contributing to total-company risk. The individual lines' values will sum to the company's risk value as shown below, making it possible to determine each line's percent contribution to the company's overall risk.

An Example (simplified for clarity of exposition)

We are going to analyze a hypothetical company with three lines of business. There are ten possible scenarios for the current underwriting year, as shown in Table 1. The number of lines and the number of scenarios in this example are both intentionally tiny to more clearly illustrate the ideas and method, which would apply in the same way to thousands of scenarios generated by an actual DFA model.

Table 1
Hypothetical Insurance Company
Income Under Various Scenarios

Scenario	Prob'ty	Line A	Line B	Line C
1	10.0%	-10	-5	12
2	10.0%	-10	-10	5
3	10.0%	-10	5	-10
4	10.0%	-5	12	12
5	5.0%	0	12	-10
6	5.0%	0	-10	12
7	10.0%	5	12	-5
8	10.0%	14	5	5
9	10.0%	12	5	5
10	20.0%	12	-10	-10
Total/Exp'd	100.0%	2.00	0.50	0.50

When generating the individual line results using a DFA model, the common parameters, such as realized interest rates, are the same across lines within each scenario. This allows actual correlating effects such as interest

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Latest Research—X-Ray for Risk

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rate movements to be reflected in the simulated results for the total company, and in the assessment of risk.

This hypothetical company's management views "risk" in terms of net income, described by two factors: the probability of negative income for the year, and the potential severity of such a net loss if it occurs. If a very severe net loss were to occur, it could trigger secondary financial consequences, so those loss scenarios are disproportionately detrimental to the company and will receive more weight.

By looking across each row, we can easily see the lines' contributions to each scenario. For instance, Line A is contributing much of the risk for scenario #3, –10 out of the –15 total, while Line B is actually helping to hedge the risk for scenario #3 by contributing positive income of +5. At the bottom of each column, expected returns can be compared. As compensation for the risk it contributes across scenarios, Line A provides four times the expected return of the other lines (2.00 vs. 0.50).

The objective is to identify which lines are contributing the most to total-company risk, and how the lines compare in terms of risk vs. return contributed.

To make the process more quantitative and objective, we follow the steps described above. First, we assign the weights. Weights are assigned as follows: zero for non-loss scenarios, one for small loss scenarios (between 0 and –10), and two for large loss scenarios worse than –10. Then we calculate the risk x-ray vector, yielding the results in Table 2.

Next we apply the x-ray to the total company and the individual lines, which gives the results in Table 3.

The "% of income" row shows the respective contributions of the lines to total-company expected income. The "X-ray result" row shows the results of applying the risk x-ray column's values to the lines' outcomes. All lines contribute to risk, with the most risk contributed by Line B. The proportions contributed by each line to total-company risk are shown in the "% of risk" row. Line A contributes one-third of the risk, Line B contributes close to half and Line C about one-fourth of the total.

The "Risk/Return" row shows the ratio of the risk percentages to the expected income percentages. For example, Line A contributes 67 percent (about 2/3) of the company's total expected income but only 33 percent (about 1/3) of the total risk, so it has a risk/return ratio relative to the overall company of 0.49 (about 1/2). Based on the idea that expected income should be commensurate to risk assumed, this

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Table 2
Hypothetical Insurance Company
Income Under Various Scenarios

Scenario	Prob'ty	Line A	Line B	Line C	Total Company	Weights	**Risk X-ray**
1	10.0%	-10	-5	12	-3	1	**10%**
2	10.0%	-10	-10	5	-15	2	**20%**
3	10.0%	-10	5	-10	-15	2	**20%**
4	10.0%	-5	12	12	19	0	**0%**
5	5.0%	0	12	-10	2	0	**0%**
6	5.0%	0	-10	12	2	0	**0%**
7	10.0%	5	12	-5	12	0	**0%**
8	10.0%	14	5	5	24	0	**0%**
9	10.0%	12	5	5	22	0	**0%**
10	20.0%	12	-10	-10	-8	1	**20%**
Total/Exp'd	100.0%	2.00	0.50	0.50	3.00		**70%**

Table 3
Hypothetical Insurance Company
Income Under Various Scenarios

Scenario	Prob'ty	Line A	Line B	Line C	Total Company	Weights	**Risk X-ray**
1	10.0%	-10	-5	12	-3	1	**10%**
2	10.0%	-10	-10	5	-15	2	**20%**
3	10.0%	-10	5	-10	-15	2	**20%**
4	10.0%	-5	12	12	19	0	**0%**
5	5.0%	0	12	-10	2	0	**0%**
6	5.0%	0	-10	12	2	0	**0%**
7	10.0%	5	12	-5	12	0	**0%**
8	10.0%	14	5	5	24	0	**0%**
9	10.0%	12	5	5	22	0	**0%**
10	20.0%	12	-10	-10	-8	1	**20%**
Total/Exp'd	100.0%	2.00	0.50	0.50	3.00		**70%**
% of income		**67%**	**17%**	**17%**	**100%**		
X-ray result		-2.60	-3.50	-1.80	-7.90		
% of risk		**33%**	**44%**	**23%**	**100%**		
Risk/Return		**0.49**	**2.66**	**1.37**	**1.00**		

Latest Research—X-Ray for Risk

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statistic shows whether a line's risk/return profile is better or worse than the company average, and by how much.

If this company's management wanted to improve the overall risk profile, one approach might be to expand slightly in Line A and contract slightly in Line B. The results of a 20 percent increase in Line A and a 20 percent decrease in Line B would be as follows in Table 4.

Expected income for the company has increased 10 percent, from 3.00 to 3.30. The most likely risk scenario (#10), which has a probability of 20 percent, has had its severity cut in half, from –8 to –4. One of the severe scenarios (#3) has been increased slightly. In total, risk is a bit lower, as reflected in the slightly better X-ray result for the company (–7.72 vs. the previous –7.90).

Applications

The example shown above is highly simplified. In practice, a more refined set of weights can be chosen to reflect risk in greater detail. Also, the weights can be chosen so as to implement a risk metric of the actuary's choice, such as tail-value-at-risk.

The concepts discussed in this article have been written about in more detail by **Rodney Kreps** in his work on co-measures (a term coined by Dr. Kreps) and by **Donald Mango** in several papers and presentations. Dr. Kreps' work includes formulas for the weights needed to implement several well-known risk metrics. Related work has also been published by **Gary Venter** and **John Major**. Those interested in a more thorough technical discussion of these ideas can consult their papers, available from the CAS online library. ■

Table 4
Hypothetical Insurance Company after adjustment
Income under various scenarios

Scenario	Prob'ty	Line A	Line B	Line C	Total Company	Weights	**Risk X-ray**
1	10.0%	-12	-4	12	-4	1	**10%**
2	10.0%	-12	-8	5	-15	2	**20%**
3	10.0%	-12	4	-10	-18	2	**20%**
4	10.0%	-6	10	12	16	0	**0%**
5	5.0%	0	10	-10	0	0	**0%**
6	5.0%	0	-8	12	4	0	**0%**
7	10.0%	6	10	-5	11	0	**0%**
8	10.0%	17	4	5	26	0	**0%**
9	10.0%	14	4	5	23	0	**0%**
10	20.0%	14	-8	-10	-4	1	**20%**
Total / Exp'd	100.0%	2.40	0.40	0.50	3.30		**70%**
% of income		**73%**	**12%**	**15%**	**100%**		
X-ray result		-3.12	-2.80	-1.80	-7.72		

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 October, 2004. This brings the total contribution of the D.W. Simpson & Company to the Trust to $90,000 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 grateful to the D.W. Simpson & Company and its employees for their contribution to the advancement of actuarial science. ■

Brainstorms

Capital For Rent, Cheap

by Donald F. Mango

Project investment models from corporate finance assume a capital owner invests in a "project," which then returns that capital, plus any profits, to the owner over time. Net present value, ROE or IRR can then be calculated, and the attractiveness of the investment proposition assessed. We will call this a *capital transfer* model, since the capital is transferred to the project managers, putting it under their control for their own uses.

Imputed Capital Transfer

The transfer model is well suited to a manufacturing business model. Actuarial research has applied capital transfer models to insurance for pricing and planning. The insurance capital transfer model presumes that the capital owner transfers imputed required capital to the various portfolio segments (e.g., contracts, lines of business), which then return it over time.

There are practical problems with implementation and interpretation of insurance capital transfer models. First, the imputed *required* capital transactions between the company and the portfolio segments are completely theoretical. The only capital transfers that do occur are *actual* transfers—reserve increases, which are permanent.

"...insurers could be thought to rent a portion of their finite supply of underwriting capacity to blocks of policies."

Second, the imputation is in fact a *mis-imputation*. Imputed means "attributed to." Imputed capital *flows* are the presumed cause of the changes in calculated required capital amounts over time. Required capital is typically calculated based on key balances (for example, written premiums, reserves). The calculated required capital changes over time not because required capital flows into or out of some required capital account, but because the underlying balances themselves change. For example, if a product segment's loss reserves decrease as claims are paid, the *calculated* required capital would also decrease.

On a more philosophical note, the transfer model *separates* and distributes capital. Separating capital is at odds with a critical fact of insurance: every policy could lay claim to potentially all the company's assets. The transfer model is unable to reflect this fundamental reality.

Space Available at the Capital Hotel

Why have we spent so much effort on the transfer model? The exact reasons may never be known, but a key reason may be that capital flows are required inputs to insurance capital transfer models. You literally cannot use a capital transfer model without assuming capital is transferred, even if the transfer is only in theory.

Can we evaluate the insurance investment proposition without capital transfer? Instead of transfer, have we considered capital *rental*—occupation over time, something like a **hotel**? Maybe the insurance investment proposition for the capital provider is more like a sticky, long-term investment in a large fixed asset.

The financial instruments backing promises to pay may be liquid investments, but a well-run insurance franchise is not. There are licenses, production channels, marketplace reputation, client relationships, pricing models, internal databases, and intellectual assets in actuarial, underwriting, claims, and finance. These critical elements all take time to develop, and cost money to maintain.

Hotels rent their space (capacity) for occupation over periods of time, for which they are paid fees. Similarly, insurers could be thought to rent a portion of their finite supply of underwriting capacity to blocks of policies. The longer those policies stay on the books, the longer they occupy capacity—reserves generate required capital, hence take up space that could be used to write *future* new business. Policies therefore must cover the opportunity cost of the capacity they use, both amount and duration.

The hotel model shows the dual modes of insurance company capital usage. A product line performing per plan is "benignly occupying space"—staying, then leaving the room intact. On the other hand, a product whose results deteriorate "damages its room," by **using up** (consuming) the capital rather than merely renting it. Similar parallels exist in physics, with potential and kinetic energy. In banking, there is the issuance of a letter of credit, which creates a potential exposure to the bank that may turn into an actual cash call.

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Tricky Track

by John P. Robertson

Three high schools—Washington, Lincoln, and Roosevelt—competed in a track meet. Each school entered one man, and one only in each event. Susan, a student at Lincoln High, sat in the bleachers to cheer her boyfriend, the school's shot put champion. When Susan returned home later in the day, her father asked how her school had done.

"We won the shot put all right," she said, "but Washington High won the track meet. They had a final score of 22. We finished with 9. So did Roosevelt High."

"How were the events scored?" her father asked.

"I don't remember exactly," Susan replied, "but there was a certain number of points for the winner of each event, a smaller number for second place, and a still smaller number for third place." The numbers were the same for all events." (By "number" Susan of course meant a positive integer.)

"How many events were there all together?"

"Gosh, I don't know, Dad." All I watched was the shot put."

"Was there a high jump?" asked Susan's brother.

Susan nodded.

"Who won it?"

Susan didn't know.

Incredible as it might seem, this last question can be answered with only the information given. Which school won the high jump?

This puzzle is from Martin Gardner's *New Mathematical Diversions from Scientific American* (University of Chicago Press, 1966) and is used with permission.

Five-Card Magic

This was a trick that required two magicians working together. An audience member picks any five cards from a standard 52-card deck and hands them to one magician. This magician looks through the five cards, picks one, hands it back to the audience member, arranges the remaining four into a neat pile, and places the pile face down on a table. The second magician looks at these four cards, and announces the suit and denomination of the fifth card.

Jon Evans' solution begins by assigning numbers to each card so Ace is 1, Jack is 11, Queen is 12, King is 13, and the others are assigned their face value. Observe that among the five cards selected by the audience member, (at least) two must be of the same suit. From any such pair the first magician selects the one that, using arithmetic modulo 13 (clock arithmetic), is n greater than the other, where n is between 1 and 6. For example if an Ace and Jack were of the same suit, the first magician would select the Ace because 11 + 3 is 1 modulo 13 (and so n is 3). This card is handed back to the audience member, and the other is put on the top of the pile of four. Before starting the trick, the magicians agree on an ordering of cards in the deck, perhaps using the values assigned above, and with suits ordered Diamonds, Clubs, Hearts, Spades. The remaining three cards are then High (H), Medium (M), and Low (L), according to this ordering. The six permutations of H, M, and L can be used to encode the number n. For instance, the magicians might agree that LMH, LHM, MLH, MHL, HLM, HML correspond to 1 through 6, respectively. These three cards, in the proper order, become the bottom three cards in the deck of four. The second magician looks at the top card to get the suit, and the remaining three to determine n, which they add to the value of the top card to get the value of the card the audience member holds.

Bob Gardner reports that he and a son have amazed his son's friends with this trick.

Ed Bouchie, Bob Conger, Kevin Conley, John Hinton, Stuart Klugman, Ken Leising**, Charles McClenahan,** Christopher Mosbo**, Tim Mosler, Richard W. Nichols, John Noble, Dave Oakden**, **Walter Wright,** and David Uhland also submitted solutions. ■

In Memoriam

Owen D. Richmond
(ACAS 1953)
May 1, 2004

Stuart Suchoff
(FCAS 1984)
August 5, 2004

Donald M. Wood
(ACAS 1937)
March 30, 2000

Brainstorms

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The rental model even handles the claim of any policy to potentially use all the company assets. Massive losses are like conflagration through the hotel—wreaking damage well beyond your own room. A catastrophic loss from one segment can impair the viability of other segments or the franchise as a whole. Transfer models cannot account for this fundamental reality.

Consider This

From a philosophical perspective, the hotel model *includes* rather than *divides*. Thinking of the capital hotel changes the focus from slicing the pie via allocation, to simultaneous, competing usage of a common capital pool. This leads to healthy peer pressure among product proponents, and a sense of a single, shared, intertwined corporate fate. It is worthy of our consideration as a valuable alternative perspective. ■