

**Actuaries: Deeper? Broader? Or Uncertain?**

Good morning! Bonjour! It certainly is a pleasure to be here this morning. Last year, my wife Maggie and I truly enjoyed the fellowship, the hospitality, and the exchange of actuarial ideas and knowledge at the GIRO meeting in Scotland; and we appreciate the opportunity to be here with you in France this year.

Having the opportunity to represent the CAS at a variety of actuarial meetings around the globe has been one of the greatest pleasures during my year as President. I bring you the greetings and warm best wishes of the Casualty Actuarial Society, and an invitation for you to attend our meetings and seminars. I hope that many of you also have an opportunity to meet my colleague Gail Ross, who is here this week, and who will be taking on the CAS Presidency when I retire in about a month's time. We see that there are many more opportunities for CAS and GIRO to collaborate, to share ideas and resources. We look forward to working with you to cultivate those opportunities.

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(MAKE SURE TITLE PAGE IS ON SCREEN) I would like to offer a few comments this morning on the directions in which we need to be moving as a profession. Specifically, I will address three directions in which I believe we need to progress. (HOLD UP FINGERS AND

COUNT) Deeper: getting better at what we already do. Broader: moving beyond the traditional confines of the turf that has been conceded to actuaries. And, I would like to say a few words about our role with respect to “Uncertainty.”

Before I begin, I'd like you to take on a bit of mental exercise. You will need a pen and a piece of paper. [Two slides with questions. You don't know answer, so estimate. Write down answers – 90% range.] We will return to grade the precision of your answers in a little while. But first, let me get back to the direction in which we need to be moving.

(Slide: DEEPER) First. Deeper. Getting better at what we already do. Let me begin by telling you what I do NOT mean by this. I do not mean adding more decimal places of apparent precision to our answers. Recently, I attended a presentation that included some comparisons of the actuarial profession in the US to some other professions. I was captivated by one slide (SHOW IT) that compared the number of members of each profession. The other professions provided their numbers rounded to the nearest 1,000 members. For the actuarial profession, the chart showed the exact number of actuaries. Of course, this chart was quite interesting in its intended purpose, showing the relative sizes of the professions. But, I thought its use of precision said even more about us actuaries. (ANGELS on head of pin SLIDE) This movement towards precision, a more precise tabulation of the number of angels dancing on the head of a pin, is NOT what I mean about getting better at what we do. I am not

talking about getting better at estimating the LAST three decimal places of an answer: we need to be more interested in the FIRST three digits.

(RESERVE RUNOFF SLIDE) This slide illustrates what I DO mean we need to do better. EXPLAIN SLIDE. Now let me be sure to acknowledge, the process of estimating reserves in our litigious society and in times of economic change is extraordinarily difficult, particularly for third party liability claims (as some of the discussion yesterday about a compensation culture indicated) and for workers compensation, which provides lifetime medical care financed by the insurer that was on the scene at the moment the injury occurred. The landscape moves and is reshaped by society long after policy terms have been written and prices agreed, long after the policy has expired, long after the claims examiner and actuary have initially estimated the needed loss reserves.

Notwithstanding the difficulty of the task, this slide says to me that we need to get better at what we do, in at least one of three dimensions. Or, maybe in all three.

First, we need to improve our performance in the analysis and modeling that we use to derive our BEST ESTIMATES. If this graph is a report card on how accurately the collective actuarial talent in the US estimated the ultimate cost of 1985 accidents, history may not give us very high marks for our work in 1985. (For the record, 1985 was the year BEFORE I went into consulting.) How many of our

methodologies are premised, implicitly or explicitly, on the past repeating itself: on recurrence of similar patterns of loss development, on continuation of past trends, on a similar distribution of claims in the future as in the past, or on continuation of past relationships between variables? And ironically, sometimes when we introduce models of increasing refinement, we merely embed the presumed repetition of the past more deeply and more subtly into the structural assumptions.

Many of you may have read a book that I propose as required reading for every actuary. It is entitled "When Genius Failed" and it chronicles the meteoric rise, and dramatic failure of an investment house in the US by the name of Long Term Capital Management. Aside from the fact that the story and the personalities are interesting, and that the book is well-written, what captivated me was the manner in which this group of extremely bright economists and mathematicians (NOT actuaries, of course) fell into the trap of believing their own models. Granted, these models were highly sophisticated descriptions of the interplay of different economic and financial variables over time. But, fundamentally, the nature of the relationships, and the parameters, were calibrated from historical data, and fundamentally the modelers assumed that the historical dynamics were sufficient to explain the range and variety of future economic performance. Suffice it to say, they were right for several years, but then catastrophically wrong. Read this book – When Genius Failed – and then look in the mirror.

Continuing on the messages I derive from this slide, the second dimension of needed improvement suggested by this slide is in the arena of persuasive ability. Perhaps the problem in 1985 was not our ability to CALCULATE the correct reserve, but our ability to persuade our employers and clients of how important it was to RECORD the correct reserve. If that is the explanation, then we all better sign up for some courses to enhance our communication and negotiation skills.

The third dimension of needed improvement suggested by this slide is in our analysis of **variability** and **uncertainty**. I would assert to you that no actuary or economist or other analyst in 1986 could have predicted the twists and turns of the economy and the operation of the tort liability system, and the resulting effects on claims against 1985 and prior insurance contracts. But, how many of us would have had the audacity to think or say, in February 1986, that the industry results for 1985 (excluding, of course, our own employers and clients) might deteriorate by 10%, or to provide our employers and clients with a sufficiently broad and sufficiently illuminating set of hypothetical scenarios, showing “if the world does X, our results will do Y”. I will touch more on variability and uncertainty in a few minutes.

So again, my purpose in including this slide is to remind ourselves that we need to keep improving our ability to deliver effectively in the core areas that our employers associate with non-life actuarial work. We need to provide a **deeper** analysis, and to explain that analysis

and its implications to our employers and clients. That explanation needs to include a thorough discussion of what might go wrong, and how wrong it might go. In short, We actuaries need to be DEEPER in what we do, and how we do it.

(BROADER SLIDE) We also need a BROADER group of actuaries. Broader. I defined this earlier as: moving beyond the traditional confines of the turf that has been conceded to actuaries. I think we need to view this notion of BROADENING in, well..., in its BROADEST sense.

- First, we need to take our talents to a BROADER array of problems and a broader array of fields. This will not usually happen by explicit invitation. Most likely, this will happen when some of us in this room, or our colleagues, see a problem that has not been solved adequately, and we see a way to apply our talents to the problem. Now, not EVERY actuary can move into these broader, wider fields – we need some actuaries to tend to the current core functions, of course -- but some of you who are pioneers and explorers can and should move into these broader, wider fields... and you must, if we collectively are going to thrive.
- Second, each of us must develop BROADER knowledge and broader skills to deal with the environment our employers operate in. Each of us must develop the skills to consider the implications of those environmental factors, based on a thorough understanding of the company's dynamics.

- Third, as team members, whether part of a management team, or part of a project team, we must increasingly collaborate with a BROADER array of other professions. Just as our expertise will be indispensable in arriving at an optimal solution, so will the expertise of the OTHER professionals be indispensable.
- Fourth, we must think more BROADLY on the geographical dimension. Our profession IS a global one. To gain the full benefit of this global profession, we must find ways to work together, we must work to make our credentials as portable across legal, regulatory, and organizational boundaries as our capabilities are, and we must collaborate to bring the discipline of the profession to new territories where functional economies are just emerging.

Now, let's return to your answers to my two questions. REMIND THEM THAT THE CODE OF ETHICS STRICTLY APPLIES TO WHAT YOU ARE GOING TO DO NEXT. TWO SLIDES with answers. RAISE HANDS IF ANSWER IS IN RANGE. ANNOUNCE "38%" AND DISCUSS RESULTS. YOU WERE TOO CERTAIN ABOUT YOUR ESTIMATES.)

(UNCERTAIN slide) Okay, with those results in hand, let's talk about the UNCERTAIN actuary. I apologize for the liberties I took with the English language (or even the American language) as I constructed parallel terms in assembling this list of imperatives. For I am talking

here not about actuaries who are uncertain whether to be deeper or broader. Rather, I am talking about the role of actuaries in helping society UNDERSTAND and MANAGE uncertainty.

Interestingly, we have been an integral part of helping society MANAGE uncertainty, without necessarily making much progress at the UNDERSTANDING of uncertainty. Every insurance and reinsurance product is part of the portfolio of tools to help members of society manage uncertainty, and actuaries certainly have played a key role in the financially sound design of these products.

But, we have not really played a sufficiently effective role at helping the public (including large commercial buyers and sellers of insurance) really understand uncertainty, so as to make an intelligent decision about what insurance to buy, and to understand the uncertainty that remains after making that purchase. In the US, for example, individuals and corporations routinely select deductibles that are disproportionately low compared to other risks they readily take on. A corporation whose value might vary by \$10s of millions weekly depending on commodity prices and exchange rates may select a \$5000 deductible on its insurance. Likewise, we have not succeeded in getting insurance company management to understand the uncertainty associated with our ratemaking and reserving estimates and to appropriately act in the face of that uncertainty.

We also have not helped society understand how the removal of small doses of uncertainty, amplifies the remaining uncertainty. Let's

look at a couple of examples from the physical world of catastrophes. Only recently have forestry managers in the US begun to understand that the logical consequence of suppressing small, frequent forest fires – is the outbreak of less frequent, but dramatically catastrophic conflagrations. And, along the major rivers in the US, we control small regular seasonal floods by building dams and levies, and build towns in their shadows, and then we are shocked and horrified when high waters eventually breach these measures and destroy our handiwork.

Now, few of us are involved in counseling people on how to buy insurance, fight forest fires, or control floods, you may argue. “I have no dog in that fight,” you may say. Well, let’s pull out that mirror again, and look at how often we present a result to management that is displayed to 7 or 8 digits of accuracy, when in fact, as with the reserves in the US in 1985, we are not really sure about the second digit. What kind of message are we delivering with our apparent 8 digit accuracy?

As the actuarial community moves from the calculation of point estimates of reserves, to the use of dynamic financial analysis to support key strategic decisions, questions of uncertainty may amplify in importance, and become even more clearly our bailiwick.

As illustrated by the little exercise we did a few minutes ago, I would have to say that we actuaries today are UNCERTAIN about how UNCERTAIN we are. I suggest to you that an important area for

further work is for us to enhance our understanding of the degree of uncertainty in our work; to improve our ability to portray the range of probable results around our estimates; to explore the economic, social, and business dynamics that give rise to the uncertainty; and to explain all of this — and its implications — to our employers, clients, and publics.

This is a significant challenge, certainly at a technical level, but also at a much more emotional level. In effect, the better we get at quantifying and explaining the uncertainty that WE know is important, the more we will be telling our employers that we cannot be very accurate at the work THEY thought they asked us to do.

It is a significant challenge, but one worthy of our best efforts, because until we and our audiences really understand uncertainty, we cannot design, select, and implement the best decisions in this uncertain world.

(FINAL SLIDE – ALL 3 CHECKED)

So, as you go forth back into the real world tomorrow, be deeper, be broader, and be more uncertain.

Thank you again for the opportunity to be here.