



theactuary

the newsletter of the
Society of Actuaries

A public market perspective on embedded value

by James Ramenda, FSA

Insurance company managements, actuaries and consultants are spending an increasing amount of time and effort preparing and analyzing financial statements using the concept of Embedded Value (EV). Calculating EV for a life insurance company is a complicated undertaking that requires a vast amount of internal company data and actuarial expertise, plus the time needed to construct and validate a model for projections.

At the same time, institutional investors—key users of insurance company financial statements—can relate to the need for an alternative approach to measuring an insurance company's financial progress. This is due to dissatisfaction with both GAAP and statutory accounting. Among the issues causing investor dissatisfaction with GAAP are the following:

- The combination of FAS 60 and FAS 97 products in a single income statement makes GAAP income statements for many companies extremely difficult to use in the sense of computing meaningful metrics.
- Intangible insurance assets, such as deferred acquisition costs (DAC) and value of in-force (VIF) are poorly understood.
- While most invested assets are marked to market, liabilities are stated at book value, creating a misleading net equity value.

Just as daunting are the difficulties with statutory accounting.

- Statutory statements can only be consolidated among themselves, not with non-statutory entities. As a result, it is very difficult, if not impossible, to properly understand all inter-company transactions within a corporate structure from statutory statements.
- Statutory principles generally are intended to be more conservative than GAAP, but in some cases seem to be just the opposite, e.g., the treatment of surplus relief reinsurance and surplus notes.

- There are nuances to the incidence of statutory earnings by policy duration and type of transaction that make statutory profits extremely volatile from period to period.
- Although statutory earnings and surplus are the bases for drawing dividends from an insurer, other avenues for liquidity, such as management fees and interest on surplus notes, are far less than transparent.

These complications compound the sense investors have (rightly or wrongly) that insurance company financial statements are subject to a great deal of management discretion. Sensitivity to this issue has been heightened by the corporate scandals of recent years.

The difficulties with insurance company financial statements have often thwarted investors seeking to place insurance company results into valuation models applicable to the wider universe of stocks, e.g., dividend discount models and discounted cash flow models. My work

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Decisions, decisions

by Morris Fishman

In the course of some research last week,
I came across the following question:

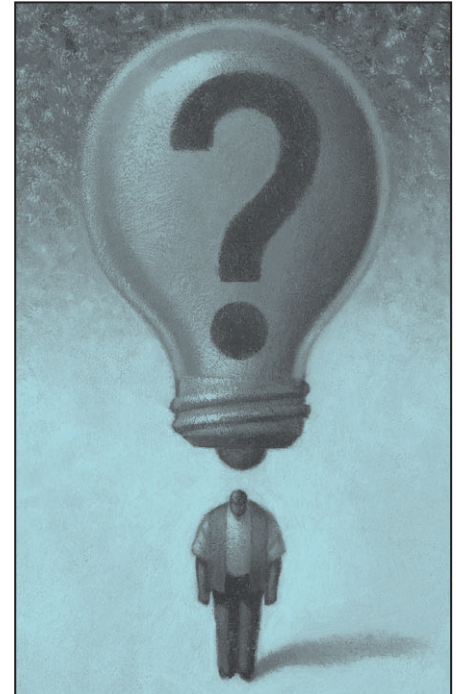
“Does the present course of study qualify
an actuary to deal with the problems of
investment risk inherent in variable life
insurance and annuities providing mini-
mum benefits?”

When and where did this appear, you
might ask? This appeared not last week,
not last year, but in 1974! Yes, you can find
it in *TRANSACTIONS OF SOCIETY OF
ACTUARIES*, 1974 VOL. 26 PT. 2D NO.
76. The title of the session was, “EXPAND-
ING THE ACTUARY’S HORIZONS TO
THE EVALUATION OF A BROADER
RANGE OF RISKS.”

Why do I bring this up? There are two
reasons. First, the debates over proper
variable annuity guarantee reserves and
methodology are still going strong 30
years after this session. The second is
the theme of this month’s edition, risk
management and the reasons for actuaries
to take the lead in this emerging profession.

Should actuaries become involved in risk
management? I think so. Our basic train-
ing requires comparable mathematical
aptitude as well as practical application.
In a way, many of us have acted as de facto
risk managers, as we balanced discussions
within our organizations with the risks
involved in a new venture, brought up
the emerging problems with an existing
program or otherwise attempted to
play devil’s advocate.

What are we, as a profession, lacking to
take the lead in risk management? Do
we lack the aptitude? No. Do we need
more education? Maybe, but not much
more than is currently offered through
continuing education. So why aren’t
banks, investment houses nor businesses
in general beating down our doors to have
actuaries solve their risk management
problems? Why do they instead turn to,
of all professions, rocket scientists who
are trained in controlled explosions?



Perhaps our basic training has given us
the wrong biases. U.S. Statutory valua-
tion’s focus on solvency has trained us
that the greater the reserves, the “stronger”
the institution. Risk-based capital has
added an additional level of somewhat
discretionary reserve which gives companies
a feeling of strength and security if their
RBC ratio is high. In current parlance,
we are trained in the known knowns
and known unknowns and gloss over the
unknown unknowns. Think of how our
past focus on solvency ignored junk bond
problems, real estate liquidity or now the
latest, capital markets pricing of variable
annuity guarantees.

Modern risk management is more about
how to identify and quantify risk, then
look for ways to mitigate it. It tries to
minimize the cost of risk mitigation and
accepts that there are trade-offs between
acceptable risk and cost. For example,
Goldman Sachs has recently increased
the amount of value at risk it would take
to \$70 million per day.

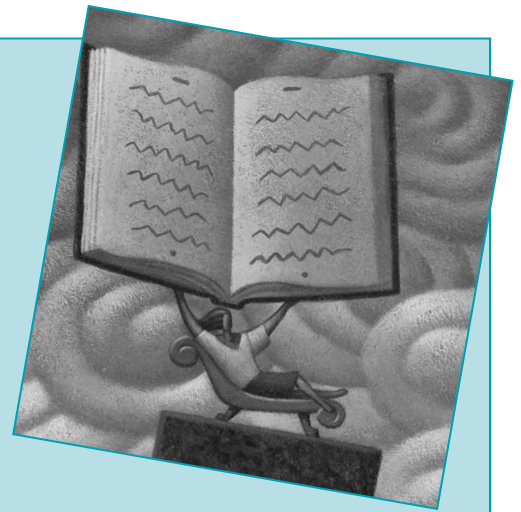
Education redesign

Having read the letter to the editor, "Will the newly approved education redesign ruin the actuarial job market" in the November 2003 edition of *The Actuary*, I would like to contribute a different view of the Waterloo program from my own experience. This response is not intended to discuss the merits of the proposed system for achieving ASA status, but I do feel it is my responsibility to defend both my degree and my school, as they have been unjustifiably discredited by Mr. Chong.

Firstly, his insinuation that students can "BS" on final exams and still obtain high marks is not accurate when describing statistics and actuarial science courses. UW statistics and actuarial science final exams, much like SOA exams, are almost entirely made up of questions with only one right answer. From my experience here at the University of Waterloo, if your approach to a question is wrong, you will almost always receive less than

50 percent on that question, which is well below a "B." The suggestion that our acclaimed actuarial science professors are so easily fooled by undergraduates is an insult, not only to the University of Waterloo, but to the entire actuarial field in general.

Secondly, the suggestion that professors tolerate cheating, or hand marks out to "sweet-talking" students as it is in everyone's best interest is simply untrue. I have witnessed, on more than one occasion, other students' backs proverbially pinned against the wall by our professors for copying on assignments worth a measly one percent of a course's overall grade. Heaven help someone if caught cheating on a final exam. Moreover, I take strong issue with the suggestion that UW professors hand out unwarranted marks. While every actuarial science prof I know does want to see his/her students succeed, I know none who would sacrifice his/her professional integrity to this end. The UW



actuarial science program prides itself on the quality of the candidates both entering and completing the program. Fraudulently awarding students is very much NOT in the best interest of the University, as those students will eventually falter in the field, and the eventual backlash could be devastating for the University.

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Editorial

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Now back to variable annuities. Why are we still debating the proper reserve methodology for variable annuities? Shouldn't we have solved that issue 30 years ago when rocket scientists were still landing men on the moon? Granted, there have been product innovations (or mistakes) that made current guidelines too expensive for companies to follow. Other guidelines have been developed to not allow charges to be brought into income until a reserve standard can be developed. Market fluctuations over the past four years brought home the fact that we cannot project the market to constantly increase and expect guaranteed benefits to have no cost. The current reserve recommendation has elements of risk management built in, yet causes concern with some since it may create non-tax deductible reserves.

What would a good risk manager do differently? Perhaps the answer would not be much different than today's actuary, but it would certainly come a lot sooner. And, it would come not as a requirement, but because it was the proper way to evaluate the risk.

While there is nothing wrong with a well thought out decision, our profession seems to debate minutia well beyond the point of diminished returns. Look at the past 30 years. Does anyone remember what happened when ERISA passed? While the actuarial profession debated the minor issues, the Federal Government established their own licensing board, and others stepped up and gained accreditation, which we now recognize. It wasn't just ERISA. Think of how we are still debating Guideline XXX implementation more than 10 years after it was first proposed. Think of the number of committees that have studied

non-forfeiture revision while product innovation achieved some of the objectives with secondary guarantees on Universal Life. The list goes on.

If we are going to be considered as broad risk managers, we have to get our own house in order. We need to develop a framework in which risk mitigation and pricing are as important as reserving. We need to accept, sell and trade risk to counterparties to improve the viability of our organizations. We need to lobby for a regulatory framework that acknowledges actuaries as risk managers and place their trust in them. If not, as we try to expand our tent, we will find ourselves alone while businesses seek counsel from another tent.

What is the answer? I don't know. I just don't know. Let me think about it for a while. I will get back to you in 30 years or so. ☺

embedded value

Embedded value

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advising institutional investors regarding insurance stocks has included an approach to fitting insurance company GAAP results into such models in a way that embodies the principles of EV. The approach is necessarily approximate because of certain realities of valuing stocks in the public marketplace. These include the limitations of public information, a typically very short timeframe as dictated by trading conditions, and the desirability of relating the valuation to GAAP financial statements.

Certainly, GAAP is the basis for the principle metrics used by institutional investors.

Using GAAP as a basis for the approach reflects that GAAP statements are considered far more transparent than statutory statements by investors. Certainly, GAAP is the basis for the principle metrics used by institutional investors, e.g., price-to-earnings ratios, price-to-book value ratios, ROE and EBITDA. While the calculations that follow will be instantly familiar in their form to actuaries who have performed statutory appraisals, the use of GAAP numbers directly from public statements and the simplifying assumptions that this requires lead to some interesting results.

Although the approach falls far short of a true EV calculation, EV terminology is used in order to better relate the calculations to their underlying concepts.

Step 1: Calculate adjusted net worth of the insurance operations

$$ANW_i = BV_G - DAC - VIF - GW + DFIT - AOCI + D$$

Where:

ANW_i = Adjusted Net Worth of the Insurance Operations

BV_G = Stated GAAP Shareholders' Equity

DAC = Deferred Acquisition Costs

VIF= Value of In-Force

GW = Goodwill

DFIT = Deferred Federal Income Tax Liability (Asset)

AOCI = Accumulated Other Comprehensive Income

D = Debt

The rationale here is to remove (1) the intangibles that are not included in surplus under statutory accounting (DAC, VIF, GW and DFIT based on GAAP timing differences), (2) accumulated other comprehensive income which typically

consists mainly of the excess/deficiency of market value vs. book value of assets, net of related DAC amortization and taxes, and (3) corporate debt, which is usually issued at the holding company level. The implicit assumption is that all corporate assets are related to the underlying insurance business. Where disclosure indicates that this is not the case, adjustments can be made.

Step 2: Calculate normalized operating profits

$$OP_{PT} = PI - RG + A + I_D - I_{ANWi}$$

Where:

OP_{PT} = Pre-Tax Operating Profits

PI = Pretax Income

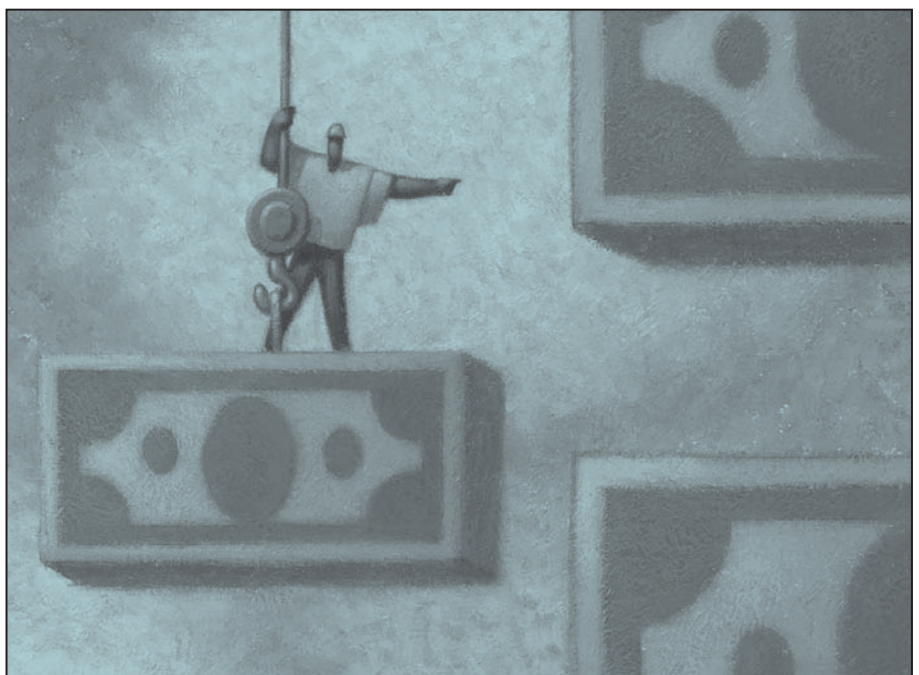
RG = Realized Gains (Losses)

A = Amortization of DAC, VIF (and Goodwill Amortization, if any)

I_D = Interest Expense on Debt

I_{ANWi} = Interest on Adjusted New Worth of the Insurance Operations

Removing realized gains and losses normalizes income to an "operating" basis (other non-recurring items should be removed, as well). Adding back amortization of intangibles adds back the main expense item recognized under statutory principles in prior periods. If new business expense deferrals under GAAP can be assumed to approximately offset the actual expense of writing new business, there is essentially no impact from new business. Thus, the net result to this point is meant to approximate statutory earnings for the insurance operations on a closed block basis. Adding back interest expense



incurred on corporate debt reflects that this expense is incurred outside the statutory entities. Subtracting interest on adjusted net worth, as defined above, means that operating profits will include only the annual earnings from the book of business, without any earnings attributable from accumulated surplus. At this point, operating profits bear an obvious resemblance to EBITDA, a relationship which will be discussed further below.

Lastly, operating profits need to be taxed. We know the taxes on pretax income as reported under GAAP from the GAAP financial statement. We subtract this amount and subtract additional taxes at a 35 percent marginal tax rate on the adjustments to pretax income used in deriving operating profits. The net result is after-tax operating profits, or OP_{AT} .

The approach provides a quantitative rationale for constructing a relevant multiple for the reported earnings.

Step 3: Calculate VIF

For each line of business where adequate information is disclosed, a run-off assumption is developed based on discussions with management, analysis of GAAP and statutory statements, industry and economic conditions, etc. In particular, we look closely at lapse data, changes in in-force business, rate of amortization of DAC and the empirical “k” factor (the ratio of DAC amortization to gross profits). The operating profits are then run off and discounted at a weighted average cost of capital reflecting an appropriate debt/capital ratio.

If the run-off rate of the profit stream, R , can be assumed to be constant, then VIF_G , the value of the in-force gross of cost of capital, is:

$$VIF_G = \sum OP_{AT} \times [(1-R)/(1+WACC)]^t$$

For $t = 1, 2, 3, \dots$

$$= OP_{AT} \times (1-R)/(WACC+R)$$

Assuming the run off rate to be a constant, though simplistic, leads to some interesting results. In particular, for investors the preceding equation is a familiar concept, capitalizing forward

earnings using a multiple, in this case $1/(WACC + R)$. Also, when considering the similarities of OP_{AT} to EBITDA, this expression improves the valuation utility of this concept by quantifying the expected longevity of the earnings flow and calculating its present value.

To estimate the cost of capital supporting the business, we refer to the company’s disclosure, usually found in the Form 10-K, regarding statutory surplus.

Companies generally disclose their consolidated surplus position, sometimes including AVR and an overall RBC level. This surplus is then run off in proportion to the run-off in the business assumed in calculating VIF. This assumes the elements of the business that create profits are proportional to the elements that create risk for which surplus is held.

An allocation by line of business can be made if necessary, as well as an adjustment to the target RBC being used in the analysis, e.g., 200 percent is common. For a given business, we’ll use S_{RBC} as the surplus level that represents the target RBC percentage at time zero. The discounted cash flow and releases attributable to S_{RBC} is then:

$$CFR_{RBC} = \sum S_{RBC} \times (R + (I_{RBC} \times (1-T))) \times [(1-R)^{t-1}/(1+WACC)]^t$$

For $t = 1, 2, 3, \dots$

$$= S_{RBC} \times (R + (I_{RBC} \times (1-T)))/(WACC + R)$$

where I_{RBC} is the pretax interest earned on surplus and T is the tax rate assumption.

The value of in-force net of the cost of capital is:

$$VIF_N = [(OP_{AT} \times (1-R)) + S_{RBC} \times (R + (I_{RBC} \times (1-T)))]/(WACC+R) - S_{RBC}$$

In this equation one can see that the many assumptions made up to this point begin to bear fruit. Note the numerator of the quotient is a forward year amount capitalized by the multiple identified earlier,

$1/(WACC+R)$, in the same fashion as a price-to-earnings ratio. Also, using this expression, one can easily relate the value of the in-force to changes in earnings, run-out rate, RBC level, taxes and the desired return on capital.

Step 4: Calculating the consolidated value

Using the approximations described earlier, the consolidated Total EV for the corporation is:

$$TEV = ANW_i + VIF_N - D$$

The debt, which was removed in calculating ANW_i , just as the interest on the debt was removed from operating profits, is now factored into to the total valuation. The market capitalization of the stock can then be compared to TEV.

Investor perspective

What does this approach accomplish for an investor?

1. From an analytical standpoint, the approach gives investors a means of linking the GAAP numbers on which they mainly focus with the concepts underlying dividend discount and discounted cash flow models. The approach provides a quantitative rationale for constructing a relevant multiple for the reported earnings (something a traditional P/E discussion often lacks). As relates to EBITDA, the approach is far more dynamic than traditional EBITDA ratios, e.g., EBITDA/enterprise value.
2. By removing intangibles, the approach removes a considerable amount of management discretion, at least in the eyes of investors. At the same time it does not run afoul of the difficulties in statutory accounting that are eliminated in consolidated GAAP statements, e.g., surplus relief, surplus notes, inter-company management fees, etc.
3. It provides an absolute value to compare with the observed market value, rather than the relativism of price-earnings multiple valuations, which are often justified only in terms of past multiples, peer multiples or overall market multiples.

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The new risk management professionals

by Narayan Shankar, FSA, MAAA

Introduction

There is a new awakening in the world of business that analytical and quantitative methods can be applied to model and manage risk. Business leaders are beginning to believe that a disciplined approach to managing risk can create shareholder value by reducing the likelihood of catastrophic “surprises” that damage their corporate reputation and result in financial losses.

New risk management professionals, recognized for their successes in banking risk management, stand ready to serve the emerging needs.

This awakening, driven mainly by regulatory developments, began in the banking industry, as we will describe in this article. Recently, it has spread to other industries. The nudging of Congress and regulators, following the recent financial scandals, provided the necessary impetus.

New risk management professionals, recognized for their successes in banking risk management, stand ready to serve the emerging needs. These professionals are

well equipped with science and theory. They are supported by a strong intellectual base, led by research programs in elite universities as well as some of the largest corporations in the financial sector.

Many of these practitioners, working in investment and commercial banks, hold doctoral degrees in hard sciences (such as nuclear physics, mathematics, econometrics, etc.) from prestigious universities

around the world. They are very talented, trained in research—through graduate school and academic experience—and skilled in applying basic principles in creative ways to find solutions to many problems, including those in the business world.

The challenge for the actuarial profession is to join this new movement as a full partner. Actuaries have centuries of practice in risk management, and we describe ourselves as professionals who “model and manage risk.” However, the new risk management professionals, with no affiliation whatsoever to the actuarial profession, are quickly establishing themselves as the risk management profession. “Risk management” is in the SOA vision statement—something hardly anyone reads—but it is squarely in the title of the new professionals. In this article, we will describe how this came about and provide additional background on the new profession.

Actuaries and risk management

Since the early years of our profession, actuaries have been involved in *modeling* contingent events. The profession developed a repertoire of basic tools and techniques to support modeling and

analysis. For the most part, a deterministic modeling approach was used that did not capture the intrinsically stochastic nature of contingent phenomena. That approach continues to this day in many areas of actuarial practice. One exception is the actuary who faces the highly dynamic problem of managing investment risk in the context of liabilities with embedded options. Many actuaries in this area are using sophisticated stochastic modeling tools.

Now let us consider the flip side of modeling and talk about *managing* risk. Historically, the actuarial approach to risk management was qualitative and intuitive. It depended heavily on “judgment” acquired from experience, rather than on a rigorous *quantitative* measure of risk. In fact, “risk” (or “adverse variability”) was not often formally measured by the actuary. This can be contrasted with the emphasis placed on quantitative measures of variability by the new risk management professionals.

A primary tool used by actuaries for managing risk was *conservatism*, i.e., the use of margins to minimize the risk of loss. A big area of emphasis has been the control of behavioral risks in contracting, including moral and morale hazards, through sophisticated policy features and underwriting techniques. A refined approach to the definition of risk classes, combined with precise measurement of the expected loss experience of each class, has been a focus of actuaries, rather than quantitative methods to model and manage portfolio risk. These traditional approaches continue to be emphasized by actuaries in the life insurance industry.

Developments since the 1950s

Theories of the measure and price of risk, as well as new tools for managing risk, emerged from the work of financial economists. They were developed in the context of pricing primary and derivative



securities, with variability of returns and intrinsic price volatility taking center stage as formal measures related to investor risk. In the 1980s these ideas began to be applied in a *portfolio* context to the management of risk in financial institutions—primarily in banks—and the new science of enterprise risk management was born.

Risk management in banks

At the enterprise level, the central risk management issue in financial institutions is the amount of capital needed to protect against adverse business results. Financial institutions need to hold capital in order to give confidence to their customers (bank depositors, insurance policyholders, etc.) that liabilities will be honored even if the institution experiences unexpected losses.

Traditionally, bank liabilities have been relatively simple, consisting primarily of checking, savings and time deposits, though more recently, banks do raise funds in the capital markets. There are generally no contingencies with respect to liability cash flows. Interest rates and guarantees can be a factor in raising funds in the retail market, but most guarantees are very short term in nature. These considerations are more an issue for marketing and operations than for risk management.

In most cases, the operating liabilities of a bank are immediately callable, with or without penalties. But there is a normal pattern of withdrawals that is quite predictable, with some seasonality. The primary focus in managing liability risk is to avoid a “run on the bank.” This can generally be achieved by avoiding liquidity concerns, reputation issues or excessive losses on the asset portfolio.

Hence, the primary emphasis of risk management in banks is on the asset side of the balance sheet. Banks invest in marketable securities, currencies, mortgages, retail loans and business loans. They generally do not employ a “buy and hold” approach to investments, but consider them to be part of a trading portfolio on which they attempt to earn a

spread over the cost of funds. The main risks faced by banks with respect to their investments are broadly classified as market risk and credit risk.

Risk management for insurers and pension funds

Some actuaries are involved in managing enterprise financial risk at insurance companies and pension funds. Due to the complex long-term nature of insurance and pension liabilities, and the contingencies involved, risk managers at these institutions usually cannot take a simplistic approach to the liability cash flows, especially in those cases where the liability cash flows are dynamic.



Actuaries have evolved a sophisticated asset-liability approach for managing insurance risks and some actuaries are at the forefront of using these tools in their

The primary focus in managing liability risk is to avoid a “run on the bank.”

practice. However, many actuaries do not employ these tools for the *management* of risks, and sometimes not even for modeling them. Often, actuaries play a passive role, using their considerable talents in this area only for the fulfillment of the statutory asset adequacy analysis function.

In order to fulfill the vision and mission of the profession, actuaries need to be actively engaged in managing enterprise financial risk. They are clearly positioned to take the lead in this area, if they will only do so.

In the pension area, the state of theory and practice in asset-liability management lags that of insurance companies. In most cases, pension ALM reduces to the choice with respect to investment policy of a “60/40” or “70/30” allocation to equity and fixed income, based on the premise that a heavy weight toward equity is appropriate due to the long duration and implicit inflation indexing of the liability obligations.

The focus of pension actuaries has been the plan sponsors and the management of their financial objectives. The incompatible goals of the IRS of prohibiting overfunding while ensuring funding adequacy have led to a bizarre set of rules that create anomalous swings in funding levels through the course of a business cycle, complicating the development of a rational ALM strategy.

The involvement of pension actuaries in asset-liability analysis can be increased. Actuaries need to take a leading role in tackling the tough theoretical and practical issues in pension valuation, funding and ALM.

The solutions may require significant legislative action to allow a better fit between theoretically sound risk management practices and permissible contribution strategies. Should there be an RBC measure for pension plans? We need thoughtful analysis of the issues and a dialogue on the financial and policy implications. With their understanding

of the big picture, actuaries are better positioned than any other professionals involved with pension plans to do the analysis and propose creative solutions to the current challenges.

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New risk management ...

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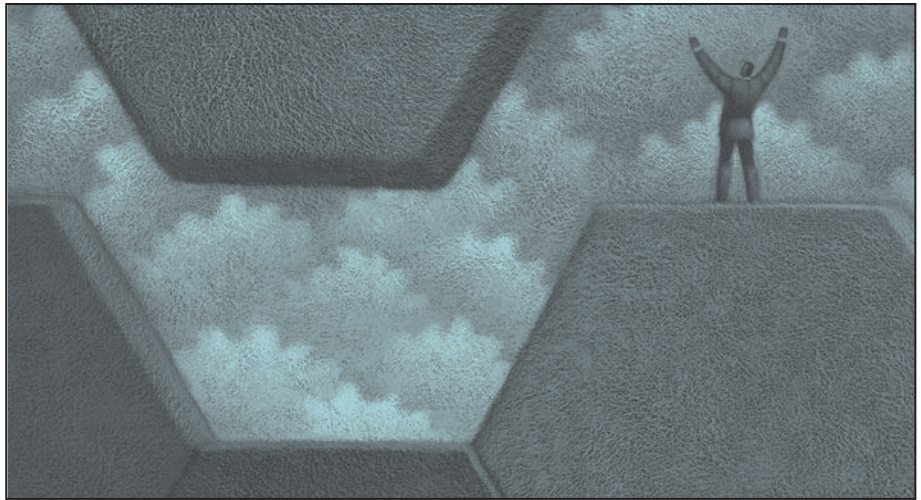
Bold, principle-oriented thinking is needed from actuaries. This is our turf, and we should be thought-leaders in this area. Unless actuaries are an integral part of developing solutions to these issues, addressing the balance sheets of pension trusts as well as plan sponsors, they risk being marginalized in an area that has historically been a pillar of the actuarial profession.

Like life actuaries, health actuaries face risk classification and loss estimation issues. They have focused on these micro-level risks and at the same time have tried to get a handle on the tough problem of forecasting health care inflation. At the enterprise level, a major risk faced by health insurers and HMOs is the prospect that cost and utilization of medical services will exceed the estimates built into premium rates. Health insurance companies have taken many creative measures over the last couple of decades to manage this risk. These risk management strategies are collectively known as Managed Care, and primarily address the liability (operating) side. Actuaries have been involved in these efforts. In the future, there may be new approaches that incorporate asset-based strategies and certain hedging techniques.

Threats and opportunities for actuaries

It's time for actuaries to step up and be enterprise financial risk managers in traditional industries. The opportunities are there for the taking. However, these opportunities will be there only for so long and we need to act fast, since senior management is beginning to see the need for an active enterprise financial risk function. The new risk management professionals can easily step in and "eat our lunch." That is already happening, with "chief risk officers" being appointed within insurance companies from outside the ranks of the actuarial profession.

It is necessary for every actuary to break out of their passivity, and think consciously of themselves as "risk management professionals," rather than premium or reserve calculators. Chief actuaries need to think at



an "enterprise" level, assessing risk and advising the CEO on threats and opportunities. It is the responsibility of every actuary to raise the overall profile of our profession and gain recognition as risk experts.

Risk management is dynamic and action-oriented. It involves making choices, reaching decisions and taking action. All the analysis in the world is wasted if no action results—the risk does not go away because it is analyzed, it only goes away when action is taken. Actuaries can be guilty of over-analyzing and under-managing. A first step in this process is effective communication. Actuaries can be the decision makers in some cases, but frequently they are advisors. Senior management is generally not aware of the risks that are present, nor are they equipped to even ask the right questions. It is not only the prerogative of actuaries to raise these questions and provide creative and reliable advice; it is their obligation.

We have emphasized the threat that actuaries face from the new professionals in the traditional areas of insurance and pension. For now, it looks like the nuts-and-bolts jobs in pricing and reserving still belong to actuaries, but the new risk management professionals are a strong competition for the enterprise-level analysis and decision-making positions. Indeed, they seem to be viewed as better equipped to understand the big picture and manage risk at the macro (enterprise) level.

Let us examine the other side of this issue. What are the opportunities for actuaries in non-traditional areas, such as banks? For the rest of this article, we will focus on how well actuaries are equipped to step in, from the perspective of technical knowledge. What comparative advantages and disadvantages do we have for success in these new areas?

The gap in the actuarial knowledge base

Actuaries are generally not familiar with the tools and techniques used to manage risk in those cases where enterprise financial risk of the asset portfolio can be separated from that of the liabilities, as is the case in banks. While there is clearly a learning curve—and most actuaries will probably have to bone up on their mathematical and statistical knowledge—it is well within the range of their skills for actuaries to attain a mastery of the state of the art in asset risk management. Indeed, it is imperative that all actuaries have a general familiarity with the tools and jargon in this field.

The following two areas might be a good place to start. One is Extreme Value Theory, which deals with evaluating the probability of unlikely occurrences. By definition, capital is held to cushion against unlikely occurrences. So, having the knowledge to measure and manage risk at the enterprise balance sheet level is important. The other area of knowledge is

modeling contingent cash flows on financial instruments, primarily options, futures and swaps that are frequently used to hedge risk or speculate in the financial markets. Derivative instruments are absolutely integral to asset management, so a working knowledge of them is necessary. However, a mastery of all the mathematics behind valuing these instruments is probably not required to work with them in the risk management field. There are software packages that do all the math.

We will provide a quick overview of the various types of risk analyzed by the new risk management professionals in banks, the current state of the art in their practice and the techniques used.

Market risk

The impetus for the birth of the new science of risk management was the fundamental question: How much capital does a bank need to cushion against market risk, i.e., the possibility of short-term losses on its trading portfolio of marketable securities? The key words here are “short-term” and “marketable securities.” It has been possible to develop precise mathematical and statistical methods to measure this specific risk. Note that while these problems are more tractable than the ones actuaries

The new risk managers are groping their way around, in many cases reinventing “the wheel.”

work on in the traditional industries, solving them usually requires more advanced mathematical knowledge than most actuaries have.

Bank regulators proposed risk based capital requirements as a cushion against market risk. To correctly measure this risk and avoid unnecessarily onerous capital requirements, banks hired “rocket scientists” holding Ph.D.s to develop the appropriate techniques. In the 1980s, investment banks had already discovered the value that advanced scientific training can bring—“rocket scientists” had been significant players in the development of new securities such as collateralized mortgage obligations and complex hedging instruments.

Once again, Ph.D.s with advanced analytical training came through for financial institutions. Using mathematical and statistical tools, including concepts from traditional Extreme Value Theory, a solid body of knowledge has been created for measurement of market risk. This body of knowledge generally goes under the jargon of Value at Risk (or VaR) methods. Knowledge in this area continues to advance.

Note that insurance companies also face market risk, but from a long-term rather than short-term perspective. Hence ALM methods, including the emerging work on contingent tail expectations, rather than VaR methods, are more applicable.

Credit risk

More recently, banks (led by bank regulators) have turned to the other basic categories of risk they face—credit and operating risk. The new risk managers are at work, and progress is being made. Credit risk for banks corresponds to underwriting risk for insurance companies. For banks, credit risk is present in both the operating portfolio of loans as well as the investment portfolio of bonds. The issue is being addressed scientifically, incorporating the idiosyncratic risk of

individual customers (i.e., the underwriting risk in the traditional sense) as well as the systematic risk of business cycles.

Measuring and managing credit risk is harder than short-term market risk, which was addressed so successfully in the 1990s. Credit risk involves longer-term economic issues and selection effects familiar to actuaries. It is a harder problem, not so easily solved using advanced mathematics, but it is also one where actuaries have much relevant knowledge.

Actuaries have much to contribute in this area, having worked on similar problems for more than 100 years. Indeed, casualty actuaries, with their experience in manag-

ing underwriting risk through business cycles, may be in a position to lead the way. The new risk managers are going for the Holy Grail, i.e., the mathematical modeling of the business cycle and its interplay with credit losses.

Another approach that is being taken is to reduce the credit risk problem to one of market risk by creating new traded instruments such as “credit derivatives” that securitize credit risk. Since market risk is already measurable, and credit derivatives provide liquidity, completeness and the opportunity to hedge, these new instruments offer a powerful way to efficiently manage credit risk. An increasing number of companies are trying to address market and credit risk in one cohesive risk management framework.

Operating risk

Perhaps the best area for actuaries to contribute is in operating risk, which includes such issues as fraud, internal controls, reputation, litigation liability, marketing risk etc. Casualty actuaries have long made a market in many of these risks, and have vast amounts of institutional knowledge, data and experience in this area. The new risk managers are groping their way around, in many cases reinventing “the wheel.” Operating risk is a messy area of risk management, where measurement will never be reduced to a science and “experienced judgment” will remain important as a factor in risk management—a skill that actuaries possess.

For operating risk, prevention is often the best form of management rather than hedging, diversification and other portfolio-type solutions, which are the primary tools for handling credit and market risk. To the extent operating risk is managed through portfolio approaches, it is often transferred through insurance and pooled by casualty insurers, which is the reason that casualty insurers have a deep understanding of the general portfolio characteristics of such risks.

Even when insurance is an efficient mechanism for managing certain operating risks, the risk management

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Actuaries — profession in crisis?

by Valentina Isakina, ASA, MAAA, CFA Level II Candidate

Back to our roots—getting reacquainted with our mission

The uncertain position of the actuarial profession in the risk management area—now and in the future—is a topic that is getting much attention at the SOA. Many groups—including the Board of Governors, the Education and Examinations Committees, the sections and various task forces—are debating ways to address the cascading effect on the profession of developments in the past several years, since the issue of risk management first made news across the globe.

Some of these developments are a serious threat to the future of the profession; others are opportunities. One thing is clear: if we want actuaries to be at the forefront of risk management, we need to stay true to our mission of being “the leading professionals in the modeling and management of financial risk and contingent events” (excerpted from the SOA mission statement—<http://www.soa.org/ccm/content/about-soa-member-directory/board-bulletin/mission-and-vision-statement/>). Achieving this mission calls for taking a fresh look at our profession, our skills and abilities; acknowledging

have been virtually unaware of the developments in risk management described in Narayan Shankar’s article entitled, “The new risk management professionals, found on page 6. These developments affect all of us. It is necessary to be alert to opportunities, and even more importantly, avoid being swept away by powerful forces while we are fast asleep.

A second step in making progress is to be a part of the solution. For the profession to be strong, each one of us needs to contribute toward influencing our collective destiny. We had a strong sense of belonging to the profession when we were taking exams, but, for the most part, the majority of us are no longer directly linked to what is happening in our organization. We don’t follow the issues being discussed by our Board of Governors. We don’t vote in our elections as much as we used to. We may not even understand that the SOA is so much more than just an examination-and-research machine. If we want to change the image of the profession and take it to new heights, we need to get involved. A wise person once said that decisions are made by those who show up. You can all become effective agents of change!

For the profession to be strong, each one of us needs to contribute toward influencing our collective destiny.

the gaps in our knowledge and background; and beginning to make important changes in how we view ourselves and our role in the world of business.

Progress—one person at a time

An important first step is to become engaged—get plugged in to what is going on around us. The world is moving faster than we think. It is likely that many of us

Recently, much work has been done by various SOA groups on the topic of risk management. Among the most noticeable developments are the Risk Management Task Force, the newly created Risk Management Section and the recently developed Enterprise Risk Management extension track for Course 8 Finance. There are other related initiatives in the works as well—the Board, the Strategic Planning Committee, those involved in the E&E redesign and various sections



are working to advance the profession in the risk management area in the traditional sectors and beyond. Obviously, members involved and the leaders of the SOA are recognizing the importance of this topic. But are we moving fast enough?

Unfortunately, there is a certain degree of a “why should I care” attitude among a portion of the membership. So far, our profession has been fortunate. Regulatory developments in insurance and pension were instrumental in the rapid growth the profession experienced in the last several decades. But this pattern is showing signs of reversing. Already, the consolidation wave in Canada is manifesting itself in the new phenomenon of a growing number of mid-career fellows who have lost their jobs and are unable to find equivalent employment, since their insurance skills are not broadly applicable. The health and retirement systems actuaries in the United States are dealing with their own concerns, and some insurance companies are starting to outsource their actuarial functions abroad. When the prosperity of a profession is directly tied to the existence of a few regulatory requirements or a lack thereof, and the profession is poorly diversified across industries, this is a sign of trouble just waiting to happen. It’s essential that we be prepared for the big changes that will affect our future—changes that might happen much sooner than we think!

What it takes to succeed

The SOA has done much work in the last two years to find out more about the actuarial competition, and now we have plenty of data on this subject (available on the SOA Web site, among other sources). The data show that the Chartered Financial Analyst designation offered by AIMR (Association for Investment Management Research) and MBA degrees holders pose a real competitive threat to actuaries. Market recognition of the Financial Risk Manager (FRM) designation offered by GARP (Global Association of Risk Professionals) is growing, and on the financial engineering/analysis side, employers highly value Ph.D.s.

Most actuaries who have studied the situation realize that risk management is the likely future of our profession as a whole—that is, if we act fast enough. There is a strong link between why the growth of the risk management field has been occurring without much actuarial involvement and the wide perception of an actuary as a “liability side technician” on account of the existing specifics-oriented, liability-side focus of actuarial education/training.

The asset-side professionals currently working as risk managers are excellent communicators and think conceptually. Thus, given new professional opportunities—such as those emerging in risk

management—they are able to easily apply their theoretical and business principles across various industries with equal success. In both risk management and finance, the market is defining a standard in terms of the people who are offered these jobs—and this definition does not typically include an actuary.

At the first SOA/CAS Enterprise Risk Management Symposium (July 2003), we conducted a Chief Officer Roundtable to solicit input from several financial services executives (both actuaries and non-actuaries) about the skill sets needed to succeed in the current business environment and to be prepared for the future. The feedback was blatantly frank: actuaries, as a whole, are lacking these skills! The feedback from the roundtable discussion focusing on the skills actuaries need to improve follows:

Chief Office Roundtable Feedback: Skills Actuaries Need to Improve

- Decisiveness/decision-making abilities
 - Improve ability to make decisions with less information
- Increase leadership abilities
 - Ability to champion change
 - Assertiveness, ability to say “no”
 - Ability to recruit top people for the team
- Increase business knowledge
 - How a general enterprise is operated, financed, managed

- Perspective of how the business units are run
- Knowledge of corporate functions

- Education/training/experience
 - Technical actuarial training is too centered on expected values
 - Broader risk knowledge, education, background are needed
 - Knowledge of alternatives is needed
 - “Trial by fire” experience is helpful (experience of a crisis management)

- Increase ability to translate technical into practical
 - Ability to communicate with senior management

This is quite a list. Some of the items might even sound like heresy to an actuary, but the facts speak for themselves. Whether we agree with it or not, this is definitely the direction in which the market is headed. A few months ago, the SOA released the results of the member/employer survey—<http://www.soa.org/ccm/content/about-soa-member-directory/board-bulletin/strategic-planning/>—which confirmed these trends even further. At the end of their discussion, the panel made a strong statement that still resonates with me: “Actuaries would rise in status in the business world if their functions go outside current traditional areas.” I would take this even further: “Actuaries *must* take their functions outside the traditional scope *if the profession is to survive.*” It is not some distant abstract threat the profession faces—it could be very personal, affecting us in our own working lifetimes.

Where will risk management spread?

During their discussion, the Chief Officer Panel provided insights on those sectors where the need for risk management is growing or about to develop. The factors—extent of regulation, complexity of business, spectrum of risks undertaken whether risk is a core competency in the business, and whether the company has to explain its risk profile to its constituencies—were used to identify which sectors are most likely to be affected by this phenomenon. Overall, the participants

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Profession in crisis?

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felt that enterprise-wide risk management is likely to be quickly adopted by the following industries:

- Banking
- Insurance
- Asset management firms
- Energy-related industries
- Telecommunications
- Government entities
- Transportation
- Health care



These areas represent a tremendous opportunity for actuaries, and many members of the actuarial profession are currently searching for guidance on how to prepare for these opportunities. The SOA market survey—<http://www.soa.org/ccm/content/about-soa-member-directory/board-bulletin/strategic-planning/>—clearly shows that actuaries have the necessary quantitative skills to take on these new roles, but the infusion of a broader skill set is necessary for success. In particular, our education has been concentrating on *applications* of the broader concepts of risk management to a very *narrow* set of sectors. As a result, having been exposed to only those sectors, we often hit a roadblock when a new opportunity in a non-traditional setting

comes up, not realizing that the underlying principles of risk, finance theory and economics are still applicable. What we need to do is be able to go back to these *principles* and utilize these to take us outside the “actuarial Berlin Wall,” to make use of these principles in broader applications. Deepening our knowledge of principles and learning a variety of cutting-edge tools that are applicable to a wide range of risk management problems will help us become formidable players in this “new” profession.

The next steps

To capitalize on new opportunities, we need to acquire the skills, knowledge and expertise that represent a combination of those we currently have and those that the “risk managers” possess. The detailed product-level expertise of actuaries within the few traditional industries they serve is extensive. However, this is not enough for actuaries to compete for higher-profile positions in the traditional areas of employment and beyond. Within each area of practice, actuarial education (basic and advanced professional) needs to stress *conceptual thinking and principles* on the liability and asset side, so that actuaries are equipped with the necessary knowledge to measure and manage risk in *any industry*. If actuarial education emphasizes the concepts and broad principles of risk measurement and management, actuaries would be better equipped to dissect the risk management problems of any entity facing uncertainty.

The academic community must take the lead in creating the new knowledge in the discipline of actuarial science.

These efforts need to include the whole spectrum of the learning process—from basic to continuing education, to self-education and professional advancement. However, without immediate buy-in and involvement from the membership, things will not progress. Here is how members at various levels can contribute immediately:

- Universities
 - The academic community must take the lead in creating new knowledge in the discipline of actuarial science, developing applications of actuarial science in new areas and training students in the broad range of techniques and skills that will allow them to expand the profession by entering new industries successfully. This role should not be confused with the role of the SOA exam curriculum, which strives to fulfill the practical short-term needs of a few specific industries and traditional employers of actuaries, and often lags behind the developments in the broader economy. The tradition of universities following the exact SOA curriculum is damaging to the *discipline* of actuarial science and, ultimately, to the actuarial *profession*. Understandably, the *SOA curriculum* will emphasize the needs of current employers. But *academic* actuarial education should go beyond, to broaden the profession as well as the career options for students.
 - Meeting the needs of current employers and educating actuaries on the knowledge needed in newly developing areas are often conflicting objectives. The result can be one of contentious debates and tradeoffs, with neither objective being achieved satisfactorily. The actuarial examination system *cannot be* and *is not meant* to be the driver of the state of actuarial knowledge. Maybe at some

time in the future, similar to what has happened in some other countries, actuarial academic and examination systems in North America will converge. If this happens, the appropriate model is for the examining bodies to accept the university actuarial education provided by the academic

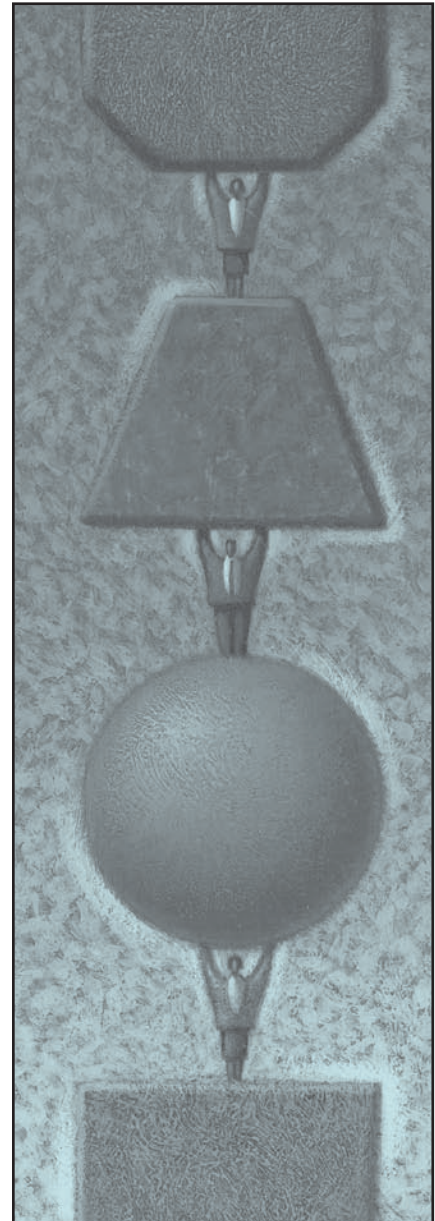
community, get out of the business of the lower level exams and focus on specialty advanced practical education. Until then, it is up to university programs to develop future generations of actuaries who are well-versed in actuarial principles, possess good communicational skills and business sense, and are capable of applying actuarial knowledge in new areas.

- Individual members and sections
 - The most effective changes are those that start from within. We need to change our own behavior with respect to continuing education. We need to acquire knowledge that will expand our horizons and empower us with new tools to do our jobs better, rather than focus only on narrow areas of specialty. The SOA sections are one resource to tap into to get this accomplished. The sections have a great deal of autonomy with respect to the education programs and products they can offer through the SOA. The SOA Web site has information about various sections and how to contact the council members. If you, as section members, speak up, the sections will listen. Let them know what you need and how you are willing to help advance our collective mission.
- SOA Examinations & Education
 - A new education and examination system is being introduced in 2005 with some exciting changes to how we approach our educational process. However, we need to realize that our new examination process, although improved, will still be subject to the trade-off issues discussed earlier in this article. We have to accept this as a fact of life and find new ways of filling knowledge gaps, possibly utilizing strategic partnerships or alliances. One approach can be to develop joint credentialing programs to supplement our exams, turning the competition into our partners while filling our knowledge gaps. Another approach can be to listen to what the marketplace tells us and to recognize competing examinations or designations offered by our biggest competitors.

For example, we could investigate how such widely demanded asset-based designations as CFA, NASD 7-Series, FRM and others can fit within the actuarial education. This approach could help us leverage the existing market success of our competitors simply and effectively.

- Actuarial associations
 - One reason competing professions and designations have been so successful in penetrating the market is that they are international in scope and have pooled their resources by coming together. While grass-roots efforts are crucial in responding flexibly to a changing environment, there are areas where coordinated action and effective centralized decision-making are critical for success. For instance, it is vital to present a consistent image of the profession in the public arena and to enhance visibility. Practice areas—life, health, casualty, pension and the new ones developing—need to learn from and build on each other's strengths. This is facilitated when they can build their loyalties around the concept of a single profession. For example, the AIMR—a result of two organizations merging together—was able to achieve its current high profile only after the merge. Our profession has a lot of potential and has much to offer as a whole, but will be less effective if fragmented. Unless we work together towards the same goals, our progress will be hampered.

It is time to be realistic, as the market's message to us is clear: the traditional back-office actuary is not in big demand and might be outsourced. To fill higher-profile roles within and outside the traditional areas of actuarial employment, actuaries need to be broadly recognized as being able to do so. Such recognition cannot be created without a consolidated effort by all appropriate actuarial organizations. It also cannot come without a conscious effort by every member, every volunteer and every candidate involved in the process. On every front at the SOA—member-level, education, professional development and strategic—we need to effect change. Time is running out.



Valentina Isakina is the SOA finance practice actuary. She can be reached at visakina@soa.org.

SOA leads profession-wide effort to promote actuaries as chief risk officers

The Society of Actuaries, in cooperation with other leading actuarial associations, has launched a public relations campaign to promote the establishment of the Chief Risk Officer positions in businesses throughout the United States and Canada. The campaign will also educate the market about the actuarial skill set to position actuaries as the best choice for this critical new role.

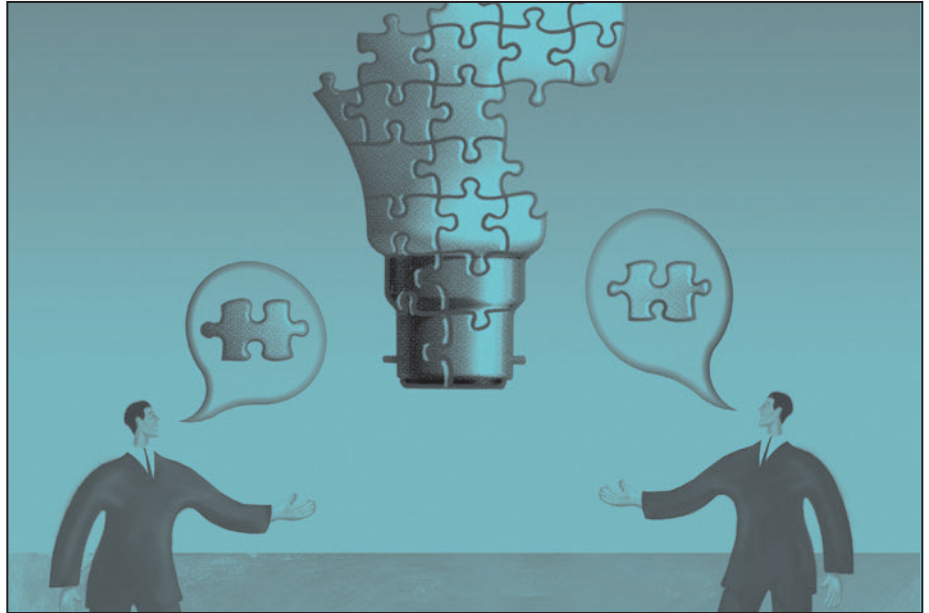
“The continuing emphasis on transparency and corporate governance reform, which is strengthened by the requirements of Sarbanes-Oxley, creates a window of opportunity for corporate CEOs and directors to build needed credibility with investors,” said Juan Kelly, senior actuarial associate, Mahoney & Associates, and a member of the Society’s Risk Management Task Force, CRO Subgroup—the driving force behind this grass-roots initiative.

“Employers already recognize our strong analytical skills and our high ethical standards,” he added, “so we can increase our value proposition—and advance our profession—if we seize this opportunity.”

Employers already recognize our strong analytical skills and our high ethical standards.

Program goals

- Generate business press attention to the call for corporate boards to require objective, integrated assessments of risks in public companies.
- Educate business leaders on the role of a CRO and how this evolving profession can add strategic competitive value to a business, as well as protect shareholders from significant financial crisis.
- Explain how actuaries are in a unique position to fill the role of CROs and how their training, perspectives and experience bring a distinctive value to this emerging field and specific advantages to the governance and management of companies.



A profession-wide initiative

Partners in the publicity program include the American Academy of Actuaries, the Canadian Institute of Actuaries, the Conference of Consulting Actuaries and

the Casualty Actuary Society. Ruder-Finn, an international public relations firm, with strong experience in financial, corporate responsibility and ethics issues, is providing professional support to this initiative.

“This program will benefit the profession immediately in at least two important ways,” added Valentina Isakina, SOA finance area actuary. “First, it will provide immediate ‘bang for the buck’ that will help to raise the visibility of our profession and second, it will help pave the way for a comprehensive, profession-wide branding campaign that is being organized for introduction later this year.”

For more information, contact Joel Albizo, SOA managing director of communications and marketing, at jalbizo@soa.org.

Hear your president-elect candidates speak

Join us at one of the SOA Spring Meetings and hear the president-elect candidates address the audience at the General Session. This is your opportunity to discover their vision for the actuarial profession and what contributions each candidate hopes to make to the SOA during their tenure.

Watch for a special supplement edition of *The Actuary* in June featuring interviews with the president-elect candidates. Also, join the online discussion forum in June and July and pose your own questions to the president-elect candidates.

Your participation in the selection of our future leaders is very important. Please vote, and encourage other Fellows to do so as well. For questions about the election, contact Karen Gentilcore at 847.706.3595 or kgentilcore@soa.org.

Embedded value

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4. With the industry in a consolidation mode, it produces a value that can be seen as a base for the company's value in an acquisition, always a point of interest for an investor. The TEV is the amount a buyer would pay, before synergies and without new business, for the total company. There is also good raw material for estimating the effect of purchase accounting for a given business combination.
5. In certain distressed situations, where a stock price has dropped sharply, the approach is useful because it still produces meaningful "floor" values where price-to-earnings ratios may not be meaningful due to sharply diminished earnings. In these situations, traditional price-to-book value ratios may also be useless because the intangible assets that often equate to the bulk of book value are usually what are being called into question. In severely

EV is already playing a role in the management of many U.S. insurance companies.

distressed situations, where the value of the book of business is highly conjectural, the value of the in-force can be set to zero, leaving $ANW_i - D$ to be considered as a potential "floor" value.

6. As TEV progresses from year-to-year, the investor can see whether and how changes in capital structure, acquisitions/divestitures and layers of new business have created value.
7. The approach illuminates the reconciliation of GAAP and statutory accounting, making it a useful educational tool for the investor.

Technical defects

The shortcomings of this approach admittedly are significant and would be overwhelming except for the fact that no approach using only publicly available data can be completely satisfactory. Here are some of the major drawbacks.

1. The adjustments to GAAP earnings and book value described above clearly do not equate to statutory earnings and surplus. Most obviously, there are differences in GAAP benefit reserves and statutory reserves that are not taken into account.
2. The treatment of deferred taxes addresses GAAP and tax accounting timing differences, but does not address statutory deferred taxes, nor any other tax complications that may arise, e.g., loss carryforwards.
3. The approach does nothing to determine whether the reserves used in the calculations are adequate, although some inference can be drawn from the pattern of operating profits over time. Of course, if a reserve shortfall is recognized via strengthening, the approach does a nice job of placing it in a total valuation context. This is a particular

benefit to GAAP-focused investors who struggle with how much to pay for prospective earnings that are newly created by a reserve strengthening.

4. More broadly, the run-off rates are developed with the best available data, but this is far from the detailed studies that underlie the assumptions in a true EV analysis.
5. The assumption that both profits and surplus supporting the business run off at the same geometric rate is fraught with potential errors. Also, there is yet another layer of approximation involved to refine the treatment of surplus to the line of business level because companies usually do not release this data.
6. At the corporate level, the approach assumes that all businesses operated by the company have a profile that can be


put in a life insurance statutory framework unless disclosure allows for a separate valuation. This is a stretch for companies with property-casualty lines and even more removed from reality for non-insurance businesses, e.g., broadcasting, money management, etc.

Each of these shortcomings can be addressed through further research and discussion with the subject company. Such follow-up is often where key insights to the business are found. Of course, apart from normal time constraints, one will find that Regulation FD may limit companies' willingness to go beyond the printed disclosure in assisting with such narrowly focused questions.

From an actuarial standpoint, one could easily argue that the shortcomings of this methodology are so numerous that it would be better to simply rely on managements to provide EV information as they see fit. However, interest in EV is already outstripping disclosure in the United States, and even as disclosure increases, investors will perform their own verification and analyses to the maximum extent possible.

Summary

EV is already playing a role in the management of many U.S. insurance companies. We expect to see it become more prominent in financial disclosure in the United States, perhaps even required. As EV increases in visibility, actuaries should expect external users of financial statements to use the data at their disposal to help them understand, challenge, and judge the reasonableness of reported embedded value. This methodology demonstrates one approach for doing so.

James Ramenda is managing director of Northington Partners, Inc. Avon, Conn. He can be reached at jr@northington.net. 

Getting stronger every day ... BOG reviews 2003 organizational results

by Sarah J. Sanford, CAE



The results are great—2003 was a year of continued strong financial performance. Improved investment performance

(\$191,000) coupled with strong operational performance (net operating of \$141,000 vs. a budgeted deficit of \$105,000) allowed us to increase net assets by \$332,000.

The strategic focus of the organization remains strong, and every strategic initiative outlined in the plan was addressed. Here are some of the strategic highlights of the year:

Organizational effectiveness

- Contracted with a nationally recognized vendor to handle elections processing. Members were given the option of using a paper ballot, but the vast majority voted online. First Ballot participation was at a seven-year high of 31.3 percent. Second Ballot participation of 31.7 percent represented a substantial improvement over 2002. User satisfaction was generally very positive.
- Completed the office move in less time and with less downtime of office systems than anticipated. Renegotiated lease agreement, resulting in lower basic rent per square foot for substantially enlarged and improved space.
- Experienced a staff turnover rate of 9.5 percent, well below the last reported association average of 14 percent.
- Conducted a full assessment of information technology resources and capacity. A number of immediate improvements as well as a plan to replace the existing computer infrastructure resulted.

- Printed and mailed dues invoices in November in response to members' concerns regarding budget cycles and tax reporting. This was of great benefit to the AAA and to the SOA as it substantially improved cash flow for the month of December.
- Completed the Governance Audit in record time and well within budget. Recommendations were approved in October. Incorporated and relied significantly upon the work of the Task Force on Practice Areas and Sections as well as its follow-up group, the Implementation Task Force in framing recommendations.

- Facilitated the Chief Risk Officers Task Force's development of a public relations proposal to build corporate and SEC awareness of the need for comprehensive risk assessments to be a part of overall reporting of results as well as on an ongoing basis. The CAS, CIA and AAA are partners in this effort.
- Completed a Risk Management Exam Track (again, in record time!) that will be offered as a Risk Management Extension exam in the fall of 2004.
- Completed comprehensive member and market research that provided guidance and direction to the Strategic Planning Committee as it prepared

The strategic focus of the organization remains strong, and every strategic initiative outlined in the plan was addressed.

- Held three Chief Actuary forums for actuaries from life, small company and health.
- Held employer focus group discussions at both spring meetings (two each) as well as three such groups at the annual meeting.



- Formed a Risk Management Section in record time (from idea to formation in less than seven months!). In part this occurred after more than 150 individuals indicated an interest in serving on its precursor, the Risk Management Task Force.

- recommendations, which were approved by the Board of Governors in October, for moving the organization and profession forward. This research also provided feedback on area of practice concerns and satisfaction with member services and products.
- Updated and revised the strategic plan.
- Expanded significantly the utilization of technology in presenting CE programs. This not only lowered expense but added value in such ways as making major meeting presentations freely available on the Web, increasing the speed and accuracy of registration (e.g. Web-based), and allowing more timely responses, via webcasts, to "hot" topics. Savings allowed significant reduction in registration fees for presenters.
- Continued distance learning program for meeting Qualification Standard.
- Established a Web portal for both E & E and CE courses.
- Embedded seminars with spring meetings.

BOG discusses hot topics at March meeting

The Board of Governors met in Phoenix on March 19-20. Significant agenda items included:

- A mega issue discussion on the relationship between the actuarial profession and academia. The background paper distributed to the Board is available on the SOA Web site—see Governance (Board of Governors and Organizational Documents). As part of the discussion, the Board reviewed a March 2000 white paper, “A Partnership between the Academic Community and the Actuarial Profession,” prepared by the Joint CAS, CIA, SOA Task Force on Academic Relations. There was general agreement with the directions outlined in the 2000 document which were:
 1. To produce a sufficient number of highly qualified students and employees.
 2. To produce a sufficient amount of theoretically sound and practical research.

3. To enhance the reputation of actuarial science within the academic community.
4. To enhance to reputation of the academic community within the actuarial profession, the business community and government.
5. To enhance public recognition of the profession.
6. To optimize the use of the combined resources of both the academic community and the actuarial profession.
7. To maintain a flexible and dynamic basic and continuing education system.
8. To support consistency of the relationship between the actuarial profession and the academic community throughout the world.

The Board charged the Task Force on Academic Infrastructure to address the issues raised in the discussion and bring preliminary recommendations back to the Board for further discussion.

- The Board also prioritized the 18 barriers to success identified at the January Board meeting. Topics receiving the highest priority ranking will be discussed as mega issues at upcoming Board meetings. They are:



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Organizational results

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Knowledge management

- Completed framework for comprehensive Education Redesign that was endorsed by the Board of Governors in June. Several new elements are designed to: improve candidate's retention of material, reduce travel time (this in direct response to employer concerns), focus on subjects specific to actuarial science (also in direct response to employer concerns) and incorporate the control cycle conceptual framework in a way that will also introduce candidates to financial security systems using interactive, self paced web-based educational tools.
- Implemented new ASA requirements in May. These changes allow greater flexibility and choice to candidates, and in addition allows them to incorporate practice specific education earlier in the process.
- Utilized member and market research to frame recommendations regarding possible new credentials/certificates potentially involving broader business skills.
- Processed a record number of exam registrations with 22.3 percent increase from 2002 on the preliminary exam side; 5.3 percent increase on higher-level exams. Largest FAC ever in November 2003.
- Completed *Medicare Drug Claims Cost Study*, a project that estimated costs of various plan options for adding prescription drug coverage to Medicare. The report was the basis of a very well attended AAA/SOA Congressional Staff Briefing.
- Conducted a joint project with LIMRA and the International Foundation for Retirement Education evaluating software products designed to help individuals and practitioners analyze retirement risks and issues.
- Published *Post-Retirement Risks Analysis and Factors Affecting Retirement Mortality*. Both provide practical, valuable information to actuaries and lawmakers.
- Developed information designed to assist actuaries entering the Viatical Settlements market.
- Developed the first ever report on expenses used in life insurance products.
- Completed a comprehensive review of the literature on the *Troubled Healthcare System*.
- Reinforced research-practice link—42 percent of research projects had section involvement.
- Decreased time-to-project completion from 33 to 18 months for all projects started and completed since June of 2000.
- Actively collaborated with research partners—24 of 52 projects, or 46 percent involved collaboration.

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www.soa.org has a new look!

From dramatically improving the look and feel of the SOA Web site, to providing enhanced features and functionality, we've made a host of changes designed to improve your user experience. Some of the key features include:

Improved navigation

Looking for information specific to your area of practice? Information on seminars, publications, research projects and more that are specific to your area are just a click away.

Site-wide search

The site-wide search is another great way to find information. Available throughout the site, this tool will enable you to quickly find content from any area with the click of a button.

Quick searches

Save time by searching the membership directory and online library directly from the home page.

Improved discussion forums

Visit the new discussion forums and discover how easy and effective it is to communicate online with other users.

Online library

Find documents for all SOA publications, including Special Interest Section newsletters, *The Actuary*, *North American Actuarial Journal (NAAJ)* and others through the improved library search.

New joblink

The SOA has partnered with Monster.com, one of the most recognized names in Internet job searches, to create a career site that offers more job postings, enhanced features and career-related content.

Printer-friendly pages

Printing important documents is much easier with pages that enable users to print documents in an easy-to-read format.

We'd like to hear from you about our new look. Send your thoughts to comments@soa.org

IMPROVED! Navigation makes finding information fast and easy!

BETTER! Discussion forums with enhanced functionality!

FASTER! Access member directory & online library from the home page!

BIGGER! New joblink with more content, more jobs and more features!

**THE NEW,
FULLY
RE-DESIGNED
SOA WEB SITE
IS HERE!**

www.soa.org



Organizational results

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Advancing the profession

- Established a strong relationship with GARP (Global Association of Risk Professionals), one of the strongest risk management organizations in the world. Developed a separate track for participants at the 2004 GARP annual convention.
- Evolved Long Term Care Conference into THE industry event on the subject. It is multi-organizational in nature, and attracts numerous professions.
- Partnered with more organizations

than ever (15 up from 7 in 2002) in Continuing Education. Examples include: Enterprise Risk Management with CAS, Investment Actuary with CIA, non-actuarial organization joint partnerships with LIMRA, LOMA, ABA and ACLI, and private company joint programs.

- Presented member and market research to Council of Presidents in November. Profession wide endorsement of need for image program.
- Participated actively in IAA discussions to enact comprehensive educational guidelines globally.
- Supported significant involvement

of members and leader (Stuart Wason) in IAA Insurance Regulation Committee completion of a paper on solvency issues.

- Provided educational and technical support as well as publicity for the IAA's new Health Section.
- Experienced continued high interest by international candidates in the SOA's exam system and credentials. Non-North American candidates for Course 1 exceeded the combined number of U.S./Canadian candidates in 2003, for the first time. Beijing and Seoul were the second and third largest exam centers respectively in 2003. 📧

New risk management ...

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tools center around "prevention," with "insurable interest" and "loss sharing" being the primary devices by which casualty insurers accomplish loss control objectives. While life insurers focus on moral hazard and selection effects, casualty insurers are also concerned with morale hazard and prevention effects.

But there are types of operating risk that have gained attention lately, such as reputation risk, for which portfolio solutions are probably not efficient. Hence, much of the focus in this area is on developing robust processes to minimize the likelihood of "catastrophe" events. "Six Sigma" is the buzzword, for those familiar with that concept.

Looking to the future

Where do actuaries fit into the new risk management profession? Currently, they are not in the picture. This is regrettable for two reasons. First, actuaries bring a lot to the table, especially in the difficult area of long-term risks that is the current focus of the new risk management professionals. Second, there is an enormous amount of dynamic energy and intellectual capital in play within the risk management profession, and

actuaries can learn a lot from these talented professionals, and re-energize our own profession with new ideas, tools and techniques.

The risk managers I meet rely upon basic mathematical ideas and theories, and think deeply and creatively from first principles. They work in partnership with regulators, such as governors or economists at the Federal Reserve Board, who are also accomplished and gifted individuals. Rather than focus on complying with complex and patchwork regulatory requirements—which actuaries can get tied up in—risk managers seem to take the lead on developing the new techniques that lead to more efficient regulatory solutions.

Being a part of the bigger picture of the risk management profession might help our profession break out of its shell. The historical solution in the insurance industry for managing enterprise risk has been building a complex regulatory structure and enforcing compliance, founded on the principle of conservatism. This has been used as a substitute for quantitative measures of variability and more rigorous mathematical tech-

niques. Actuaries have approached this system somewhat passively, often focusing their energies on managing to the regulatory rules rather than managing the underlying risk.

The new risk managers are action-oriented, creating dynamic market-based strategies to address some of the same risks actuaries work with every day. Many complain of the same problems actuaries face, that the managers they advise don't understand the theory and the numbers. But they seem to have the ear and the respect of their CEOs, based upon a history of success within the two short decades this "new" profession has been in existence. Their success and dynamism can serve as a useful inspiration for actuaries, as we seek to strengthen our profession and position it for an even brighter future.

Narayan Shankar is the SOA staff fellow for life practice. He can be reached at nshankar@soa.org. 📧

Surprising results from Computer Science Section's curriculum survey

by Randall A. Kaye, ASA

In performing their work, Computer Science Section members utilize a wide variety of technical skills. Many useful "computer science"-related subjects are not covered by the SOA exams, though may be considered extremely important in the day-to-day work of actuarial staff.

The Computer Science Section membership was surveyed to help understand which topics are important for actuarial staff to have a working knowledge of, at either the "early career" or "mature career" stage. Over 250 members completed the survey.

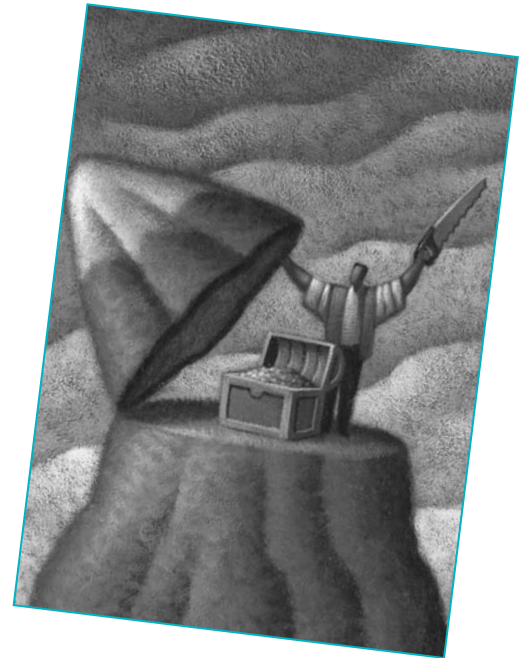
The results shown here are based on a scoring system from 0 = Unimportant to 5 = Must Have; the results were then converted to a percentage. A score of 3.5 or more is significant, since it would imply a level of importance somewhere between 1 and 2.

1. 70 percent of the respondents felt that it was 5 = Must Have.
2. 100 percent of the respondents felt that it was 3.5 = Important.

A score of 3.5 or more was achieved in the areas shown in Figure 1 below.

While the importance of system-related topics such as spreadsheets, programming languages, database concepts, documentation and project management were expected, the surprising result from this survey is that respondents felt so strongly that numerical algorithms (especially basic calculus, interpolation, extrapolation, estimation and errors) are still considered a "Must Have" in importance.

Yet the traditional actuarial skills of calculus, numerical analysis and graduation methods have been removed from the E&E syllabus over the last decade, or



if not removed, perhaps mentioned as "pre-requisites." This survey shows that the membership still judges these skills as extremely important, and the Computer Science Section Council encourages the E&E Committee

Score	Early Career
4.7	Mathematical applications, especially spreadsheets (including macros).
3.9	Documentation, such as program comments, system documentation and user documentation.
3.8	Numerical algorithms, especially basic calculus, interpolation, extrapolation, estimation and errors.
3.5	Statistical analysis, especially regression, distributions, standard deviation and Monte Carlo methods.
3.5	Database concepts, such as hierarchical and relational, queries, unions and intersections.
3.5	Programming languages, especially procedural languages (C, Fortran, Basic).

Score	Mature Career
4.0	Mathematical applications, especially spreadsheets (including macros).
3.8	Project management & planning, such as Steering Committee, Project Sponsor, Critical Path, Dependencies and Gantt Charts.
3.6	Financial Aspects of Information Systems, such as Total Cost of Ownership, Business Risk and Return on Investment.

Figure 1

continued on page 21

to consider reinstating numerical analysis and graduation on both the E&E syllabus and examinations.

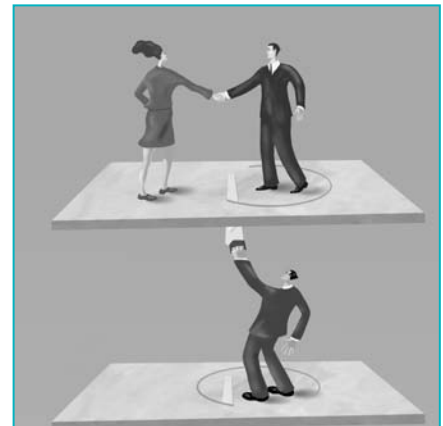
Colleges and universities are also encouraged to review these results, and interpret them as a “call to arms,” or at least a reinstatement for some of the more traditional actuarial skills.

The Computer Science Section of the SOA recommends that colleges and universities develop curricula for actuarial science programs which reflect the results of this survey and which enable college and

university students interested in pursuing an actuarial career to select appropriate courses.

Complete survey results can be found in the Computer Science Section of the SOA Web site at www.soa.org/ccm/content/areas-of-practice/special-interest-sections/computer-science/compact-newsletter/.

Randall A. Kaye is principal at arc360 in Toronto. He can be reached at RAKaye@compuserve.com



meeting notes

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Barriers to success of the profession:

1. How do we broaden our skill sets to meet the changing environments and opportunities?
2. How do we align our public image with our strengths?

Barriers to success of the SOA:

1. How to grow our membership and employment opportunities simultaneously?
2. How do we make the SOA more effective as an organization to maximize constituent value?

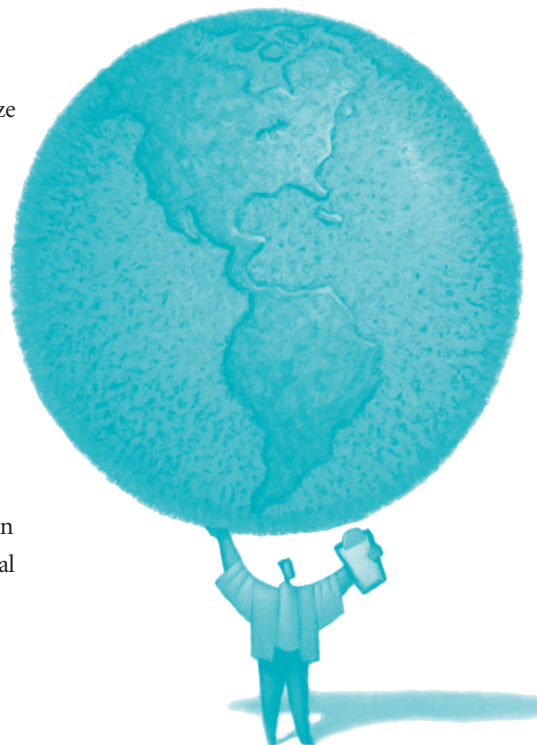
- The newly revised strategic plan, outcome statements and corresponding measurements were approved. The strategic plan is available on the SOA Web site—see Governance (Board of Governors and Organizational Documents). Board-level outcomes supported by measurements are:

- Increasing actuarial employment
- Improving stakeholder satisfaction
- Increasing the value of the credential
- Demonstrated efficiency and effectiveness
- Enhanced “actuary” brand
- More able and employable members

- More outwardly focused organization
- Increased volunteer participation
- Sufficient resources to deliver on the priority projects for the strategic plan while maintaining appropriate membership equity

Other business included:

- Approving the 2003 audited financial statements.
- Establishing a task force to oversee the consideration of a business communication skills certification program.
- Endorsing the release of the “Report of the Insurer Solvency Assessment Working Party” as an IAA publication so the report can be used as a basis in discussions on solvency framework with the IAIS and other regulatory and supervisory organizations.
- Reviewing recommendations from the Task Force on Services to Canadian Members, which called for strengthening the communication between the SOA and CIA.
- Authorizing the NonMortality Decrement Task Force to release the 2003 SOA Pension Plan Turnover Study.



Questions can be directed to Neil Parmenter at nparmenter@soa.org or Cheryl Enderlein at cenderlein@soa.org.

Covering the globe with ALM practices and techniques for insurance companies

At the heart of ERM

Over the last few years, Enterprise Risk Management (ERM), which includes an array of financial and non-financial risk measures and tools, has been the center of attention in the banking and insurance worlds. As the science of ERM has expanded, so too has the role of asset liability management (ALM) as a vital part of an overall ERM framework. Many people can recall the time when ALM meant “Asset Liability Matching.” However, the “management” of ALM now goes beyond measurement and mitigation of the risk exposure to a broad methodology whereby companies achieve their financial objectives and gain competitive advantage.

Given the rapid evolution of ALM and the different regulatory environments that surround life, P&C and pension, a lot of practitioners can find very little guidance in current literature. To address this, SOA and Nexus Generations have produced an Asset Liability Management symposium that covers ALM theory and reinforces it with case studies and in-class applications. Initially conducted in Phoenix, Arizona in December of 2003, the course was a sell-out. One-quarter of those in attendance were outside of the United States, strongly suggesting that the need for information does not know any geographical boundaries.

A worldwide tour in 2004

In 2004, the three-and-a-half-day course, “Asset Liability Management Techniques and Practices for Insurance Companies,” will be held in four different locations across the globe. Participants may also register for one full day of “ALM Essentials” immediately preceding the course. Additionally, a post-course,

“Workshop For Senior Management and ALM Practitioners,” will give senior management and ALM practitioners the opportunity to address their specific issues and areas of concern with other experts. The dates and locations for the courses are:


June 20-24, 2004
 Conrad Hilton Hotel, London, England
 July 27-31, 2004
 Westin Tokyo Hotel, Tokyo, Japan
 September 26-30, 2004
 Fairmont Chateau Frontenac, Quebec City, Canada
 December 5-9, 2004
 Hilton Tobago, Trinidad & Tobago

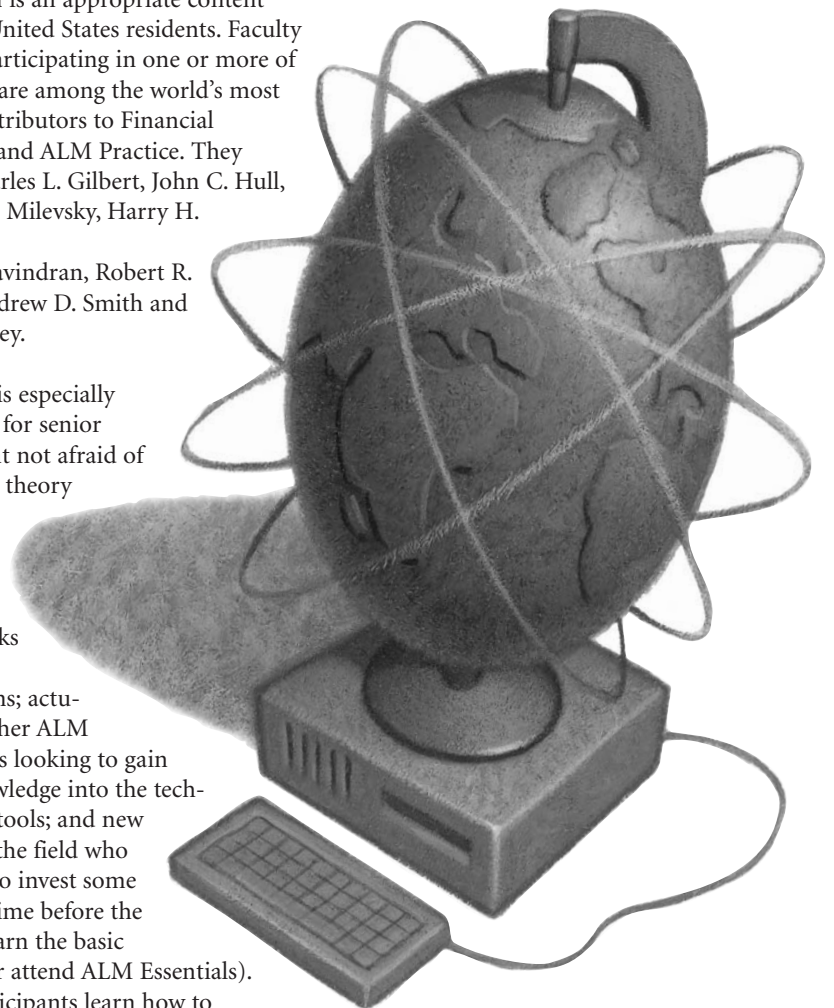
All-star faculty line-up

Each course will contain some emphasis on issues specific to the host region, but any location is an appropriate content choice for United States residents. Faculty members participating in one or more of the courses are among the world’s most notable contributors to Financial Economics and ALM Practice. They include Charles L. Gilbert, John C. Hull, Moshe Arye Milevsky, Harry H. Panjer, K. (Ravi) Ravindran, Robert R. Reitano, Andrew D. Smith and Peter D. Tilley.

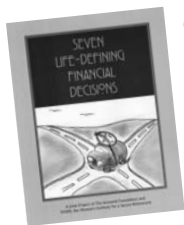
The course is especially appropriate for senior management not afraid of quantitative theory and looking to gain a firm grasp of the financial risks facing their organizations; actuaries and other ALM practitioners looking to gain deeper knowledge into the techniques and tools; and new entrants to the field who are willing to invest some additional time before the course to learn the basic concepts (or attend ALM Essentials). Course participants learn how to

implement ALM as a strategic decision-making framework and to ensure that appropriate policies and control procedures are in place. Attendees discover the limitations and pitfalls of various risk metrics and how to communicate risk exposure and make more effective decisions. Some of the more specific course objectives include formulating an ALM strategy for Universal Life, executing a dynamic hedging strategy for a variable product, and participating in a mock ALM Committee meeting.

For complete registration information and course agenda, go to <http://www.soa.org/content/ce-meetings-seminars/conference-and-symposiums/asset-liability-management/>. 



Seven Life-Defining Financial Decisions



The Actuarial Foundation partnered with the Women's Institute for a Secure Retirement (WISER) to produce a booklet as part of its

consumer education efforts. Seven Life-defining Financial Decisions discusses how decisions made throughout a lifetime—choosing a career, getting married, having children, buying a home, starting to save and invest—can have an enormous impact on your future financial security.

This 60-page guidebook is available for \$6 from the Women's Institute for a Secure Retirement by calling 202.393.5452 or visit their Web site at:

www.wiser.heinz.org. The guidebook and background paper can also be viewed or downloaded from The Actuarial Foundation's Web site at: <http://www.actuarialfoundation.org/consumer/wiser051503.htm>.

Letters

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Whatever Mr. Chong says, I know that my transcript accurately reflects the skills and knowledge I have gained in actuarial science. I have worked hard for my degree, and I take pride in it.

Matthew Till
Matthew_till@hotmail.com

Exams editorial

(To Phil Bieluch) I saw your editorial in *The Actuary* (March issue—"All I really need to know I learned on the actuarial exams"). I like your emphasis on education above and beyond that which is "forced." The ethics of a responsible actuary should spur him on to learn what he can to carry out his work truly competently. I applaud you for bringing up this issue.

David Wiener
dwiener@presidentallife.com

Variable annuities

The article by Phil Bieluch and Hubert Mueller in the March 2004 issue of *The Actuary* ("Managing the risks from variable annuities—the next phase") contains an incorrect analysis of the interest rate risk in variable annuities. They claim that an increase in interest rates can cause difficulties if not hedged.

In fact, the Rho for embedded options in variable annuities is generally negative. If interest rates go up, the value of the embedded option goes down.

Typically the minimum guarantee related embedded options in a variable annuity behave like a put option. Put options become more expensive as interest rates drop. There are two reasons for this. First, a lower interest rate environment means the expected growth rate of equities under capital market assumptions is reduced accordingly. This means there is a higher probability that the put will finish in the money. Second, lower interest rates means that the present value of payoffs will be greater.

Because interest rates impact the probability of payoff, the amount of the payoff, and the present value of the payoff puts tend to have high convexity. This is similar to the convexity in mortgages and swaptions. In variable annuities with living benefits, this convexity can be further increased by dynamic customer behavior.

These factors far outweigh the issues associated with interest rates raised by Bieluch and Mueller. A mention is also made of put futures. Futures contain no optionality, so they are not referred to in terms of calls or puts. If you want protection from a rising stock market you buy futures. If you want protection from a falling stock market, you sell (or short) futures.

Mark Evans, FSA
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Bieluch and Mueller respond

Mr. Evans offers further evidence for one of the conclusions of the article, "Matching Rho should also be considered." In the article, we focused on matching Rho with examples based upon interest rates. Mr. Evans expands the discussion to include the consideration of the correlation of interest rates to the equity markets with the further assumption that lower interest rates imply lower equity prices, a point that is best, outside the scope of this article.

Mr. Evans is correct that there are no "put futures" available. Our usage was intended for the casual reader to understand that the right to sell an index at a predetermined price was what was contemplated by the buyer of the futures.

We thank Mr. Evans for furthering the discussion of this current topic.

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