



theactuary

the newsletter of the Society of Actuaries

Principles-based regulation of variable annuities Proposals now at pivotal stage

by Max J. Rudolph, FSA, CFA, MAAA

Computers have gotten faster and actuaries have used this improved technology to develop increasingly complex product designs. Products are often designed to perform well in “normal” times, where expected value analysis is adequate, but are susceptible to low probability, high impact, events. Regulation can temporarily get out of sync with the “next generation” of products. This is nothing new. As equity markets dropped in the early years of the new millennium, the risk associated with providing various forms of performance

guarantees necessary to stay competitive increased and were recognized. In the past couple of years, several companies sold their in-force block of variable annuity policies, perhaps at a loss. Others have reduced their risk by purchasing hedges against further declines in the equity markets, with a resultant hit to the bottom line.

Much like our accounting brethren, the debate is heating up between rules-based and principles-based regulation of life insurance and annuities. Whether the product line was universal life or deferred annuities, one size fits all formula/factor driven capital and reserve requirements have lagged behind while product features raced ahead. This is a downside of rules-based regulation. Variable annuities (VA) are a good example of a product line with popular features that have moved beyond standard formulas.

Reliance on rules instead of principles resulted in writers of VAs with guaranteed benefits initially holding no statutory reserves or risk-based capital for those product features. Since these products provide a floor benefit that kicks in when the invested funds have done poorly, value has been created for the policyholder. Both reserves and capital should reflect that value. Regulation has lagged economic reality. The American Academy of Actuaries’ (AAA) recommendation

attempts to build a framework that allows company specific features and assumptions to be modeled, providing a connection to reality that factor-based results cannot hope to accomplish. With fair value accounting and Basel 2 soon to be implemented internationally by financial institutions, the time is now to address this issue.

Life insurance and annuity risk has been defined as fitting into a structure where C-1 represents asset (credit) risk, C-2 insurance risk, C-3 asset liability

mismatch risk and C-4 other business risk. For variable annuities, the interaction between liabilities and the assets backing them causes most of the risk to be categorized as C-3 ALM risk.

The Risk Based Capital C-3 Phase II project is an attempt to move toward principles-based

capital and reserve requirements, at the same time requiring transparency to regulators by creating an actuarial opinion and memorandum. Better methods are required, both to value these product lines and to set capital requirements. Recognizing this, the Life Risk Based Capital Working Group of the NAIC (LRBCWG) asked for a recommended capital standard from the American Academy of Actuaries. In response, the AAA Life Capital Adequacy Subcommittee’s C-3 Work Group, chaired by Bob Brown, FSA, MAAA, consultant



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editorial

Overruled

by Alan Parikh

“So what Jefferson was saying was, ‘Hey! You know, we left this England place because it was bogus. So if we don’t get some cool rules ourselves, pronto, we’ll just be bogus too.’”

—Jeff Spicoli, “Fast Times at
Ridgemont High”

The search for cooler rules goes on. Let’s
look at some examples of rules gone bad:

Enron’s fall revealed aggressive application of the accounting rules governing off-balance sheet debt. While crafted to comply with the letter of the rules, Enron’s “special purpose entities” concealed liabilities and risks from investors’ view. The difficulty of proving outright fraud has lent credence to the suspicion that the rules themselves are faulty. The consequence? The Sarbanes-Oxley Act, and further momentum towards “principles-based” accounting standards that the International Accounting Standards Board endorses. These would replace “bright-line” rules, and numerical tests, with clear statements of the underlying accounting principles. Key accounting decisions will fall to the judgment of the company and auditor.

Pension law in the United States is another sad tale of unintended consequences. ERISA began as a law enforcing the security of pensions that employees had purchased with hard labor. Since then, rules and regulations have grown into a staggering mass of administrative, legal, financial and fiduciary burdens, punishing every plan sponsor who ever promised an employee a pension.

The latest battle over cash balance pension plans is an example. These plans emerged in large numbers as employers redrafted their pension promises to broaden their appeal to employees of all ages. By repackaging the pension promise to be readily comparable to 401(k) plans, companies hoped to reap greater rewards for the time, cost and aggravation they incurred in offering pensions. In some cases, cost savings were also a driver.

In changing the pension promise, employers took care to comply with ERISA’s pension safeguards. Benefits earned prior to the change were scrupulously protected, including ancillary early retirement subsidies. But employers did not imagine that ERISA’s pension protections would be held to apply prospectively—to benefits not yet earned. Aggrieved employees, attorneys and pension activists sought support for the notion that once you’re in a pension plan, you own not just what you’ve earned so far, but everything you expect to earn from that plan in the future.

Failing to find any support for the prospective pension right in the thick binders of pension regulation, plaintiffs’ attorneys sought something of similar value. They just might have found it. The federal court for the Southern District of Illinois has opined that a “cash balance” pension dollar is worth much more to a twenty-year-old than to a sixty-year-old, and that the sixty-year-old is owed the difference. Cash balance opponents cheer the decision, looking for leverage to get that prospective right they’ve wanted all along. But if events continue along this course, then one day pensions won’t be a prospective right, a retrospective right or any kind of right—employers will just get rid of them—as is their right.

Sometimes, rules work in ways nobody expects. Pension law presents an object lesson in how the gradual accretion of rules can threaten the system itself.

So maybe the SEC and the FASB are moving in the right direction by endorsing “principles-based” or “objectives-based” accounting standards. True, it’s a lot easier to monitor and enforce compliance with a rule than a principle. But a principle, explicitly embedded in the rules, can be a handy reminder of the rule makers’ intent when things spin out of control.

And unlike a rule, a principle does not tell you exactly when you crossed the line—which means that you really have to watch your step. 🍷

M&A

James Stoltzfus' article on health care reform and health insurance mergers in the January issue of *The Actuary* is a good starting point for lots of discussion. Partly in response to the Clinton's plan, The Travelers and Met Life spun off their group health operations, merged them under MetraHealth, and then sold the whole thing to UnitedHealth Group. It was clear that the managements felt that smaller companies (and perhaps even the larger ones) could not survive under such draconian proposals. One interesting side note here is that no one predicted that political ineptitude and bureaucratic inertia would result in nothing happening. Twenty-twenty hindsight says this was a likely occurrence all along. But just the threat was enough to influence this merger and acquisition (M&A).

Although Mr. Stoltzfus' drivers of M&A are clear, they are not at all certain or complete. Bigger is not always better; there are lots of examples of recent acquirers that have had lots of trouble eliminating redundant systems. In the United acquisition, some duplicate systems ran in parallel for some time until a clear "winner" emerged. This had

the unintentional effect of spurring productivity gains under the threat of elimination by your internal competitor—more direct and immediate than external competition. Those gains included advancing capabilities and reducing expenses way beyond the expected improvements in economy of scale.

Another benefit of United's acquisition was the diversity of expertise that it acquired, in particular the actuarial staff. United had no internal actuarial staff prior to the acquisition. Now the words "pricing discipline" and "ahead of the pricing cycle" regularly find their way into the quarterly earnings reports. But the benefits of diversity are not certain either. Management has to recognize the potential impact and it's not always apparent.

Other macro level reform impacts can be seen in statistics—like the prescription drug component of CPI—which tends to rise and fall inversely with health reform activity. Those changes manifest themselves in this component because of the discretionary nature of pricing and a relatively minor regulatory impact. Unfor-



tunately recent declines in rx cpi are impacted by brand names going generic, like Claritin, for example. We need to have a way to remove this changing impact for this discussion, although it's quite relevant to leave it in for other purposes.

I strongly encourage other actuaries who have experienced M&A to join this discussion. ☺

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39th Actuarial Research Conference

The University of Iowa will be hosting the annual Actuarial Research Conference (ARC) August 5-7, 2004 in Iowa City. The 2004 ARC provides an opportunity for academics and practitioners from around the world to meet and discuss actuarial problems and solutions. The conference also provides a forum for discussion of general actuarial education issues, particularly as they affect universities. Presentations are welcome on all topics of interest to actuaries.

To ensure a spot on the program, participants who would like to make presentations must submit an electronic copy of their title and abstract to Elias Shiu at

elias-shiu@uiowa.edu by June 1, 2004. The deadline for early registration is July 1, 2004; the deadline for housing reservations is July 5, 2004.

Additional information regarding the conference—including the registration form—is available on the conference Web site <http://www.uiowa.edu/~confinst/production/actuarial/index.htm>. For questions on program information, please contact Jim Broffitt at the University of Iowa at *james-broffitt@uiowa.edu*. Questions regarding registration, fees or accommodations should be directed to Kelly Flinn at *kelly-flinn@uiowa.edu*. ☺

variable annuities

Principles-based regulation ... *continued from page 1*

for CIGNA Retirement & Investment Services, Inc. in Hartford, Conn., formulated an approach for setting regulatory risk-based capital requirements for variable products with guarantees. This recommendation excludes index guarantees (addressed in a separate project) and variable life insurance (likely addressed at a future time).

A similar group, the Variable Annuity Reserve Work Group, chaired by Tom Campbell, FSA, MAAA, vice president and corporate actuary for Hartford Life Insurance Co. in Simsbury, Conn., has produced a recommendation for statutory reserves. The goal of these groups is to coordinate the requirements to the largest degree possible to minimize the work of meeting both sets of requirements. While there are many similarities between requirements for capital and reserves, especially in the model building, there are enough differences to justify separate teams. Reserves are regulated by the states, while RBC requirements are set directly by the NAIC.

Thus, the two work groups direct their efforts towards different bodies. In addition, the VA reserve project had been going down the path of formulaic reserves when obstacles were encountered and regulators suggested utilizing the stochastic approach of C-3 Phase II.

This article presents the status of these developments as of mid-February 2004. The March NAIC meeting will, hopefully, answer several questions that are still outstanding. These include the planned implementation date, whether a floor reserve will be required, inclusion (or not) of in-force policies for applicability of the new reserve standard and the ultimate form of the reserve requirement (actuarial guideline, model regulation or revision to the Standard Valuation Law). By letting your thoughts be known now, there is still time to influence the process. To express

your opinion on these proposals, contact the NAIC's Mark Peavy and Dan Swanson, with a copy to Steve English at the AAA. Other NAIC initiatives are underway that are expected to follow the principles-based requirements of C-3 Phase II.

While there are many similarities between requirements for capital and reserves, especially in the model building, there are enough differences to justify separate teams.

This project takes another step down an evolutionary path that includes cash flow testing, regulation XXX and other reserve requirements that require multiple scenario testing and company specific data to support formula reserves. The work done on this project may set the groundwork for other product lines to set their reserve and capital requirements. "Best practice" pricing already utilizes a similar methodology. This work may also influence other practice areas that work with high impact, low probability events. Property insurance in areas susceptible to hurricanes and earthquakes, along with pension products invested in equities, clearly fall under this umbrella.

Although the methodology seems very complex, and it is, these products must be modeled across a variety of economic scenarios. The modeler often does not know if a given scenario comes from the tail of the distribution until after the model is run. Much is dependent on the

block of business. Because of the variety of variable annuity product designs (with more design possibilities in the future) and the number of "moving parts," attempting to develop deterministic scenarios to measure these risks was felt to be an impossible task.

Actuaries who work with annuity products may recall Phase I of this project. It uses interest rate scenarios to stress test single premium life insurance and fixed annuities, using a company's actual mix of assets and liabilities. A large set of stochastic scenarios form the universe from which a subset of stressful scenarios

is chosen. In both phases of this project, an attempt has been made to overcome the shortcomings of the factor-based approach to risk-based capital. No company's block of business is "average." Using a company's actual mix of business, and running a

broad range of scenarios, will develop a company-specific distribution of risk exposures. This aligns reserve and capital requirements with an appropriate way to manage a block of business. It also lays the foundation for holistic reserves and capital, which consider correlations between a company's assets and liabilities when calculating an appropriate total asset requirement (TAR) for a specific company.



The goal for both groups is to finalize requirements in 2004, with capital requirements possibly implemented for year-end 2004. The rest of this article will provide an overview of the recommended methodology.

General description

The approach that the work groups have recommended uses a conditional tail expectation (CTE) measure, which is described later in this article. Actuarial certification of results will be required. Modeling hedges is allowed if the insurer is following a clearly defined hedging strategy. An alternative method (AM), using factors instead of scenario analysis, will be allowed for blocks of guaranteed minimum death benefits (GMDB). Products with guaranteed living benefits must be modeled, since product features are not standardized across the industry and the potential number of combinations would be unmanageable. The goal is to provide flexibility for companies with significant blocks of VA business while generating factors that are fair for those who don't.

What products are covered?

The focus of this project has been on variable annuity products. This is due primarily to the non-diversifiable nature of equity risks when combined with death benefit and living benefit guarantees common to these products. For example, a GMDB option might guarantee a death benefit that is the higher of cash surrender value and an accumulation (or roll up) of the initial premium at 5 percent per year. Similar products, like those providing minimum death benefits to a mutual fund or group annuity type product, are also now included in the recommendation. With negative returns during 2000-2002 in most equity markets, current net amounts at risk might create a significant probability of large future benefit costs at some companies. The goal is to better recognize that risk and provide an adequate provision for it.

Scenarios

Companies are encouraged to use their own models to generate fund returns, but must calibrate model parameters using historical returns (currently 1953-2002). This will maintain comparability of scenarios between companies. While use of these models is not required, much of the scenario work has used Regime Switching Log Normal (RSLN) models. An RSLN model developed by Dr. Mary Hardy, FSA, FIA, at the University of Waterloo, is available for educational purposes on the SOA Web site under the

Some have commented that the historical results seem high relative to an individual's current expectations of long-term returns. RSLN model parameters use arithmetic mean returns. Geometric returns (reality) are lower if year-to-year results vary. As a simple example, consider returns on the S&P 500 index for 2002 (-22.09 percent) and 2003 (+28.67 percent). The arithmetic mean is 3.29 percent, but if you actually invested money over this period you would have earned the geometric average of .12 percent per year. The mathematics are

Companies are encouraged to use their own models to generate fund returns, but must calibrate model parameters using historical returns ...

Research Area of Interest. These models assume that, most of the time, equity returns follow a distribution that can be described as stable, with moderate volatility. However, in order to describe the

$(1+.0012) \times (1+.0012) = (1-.2209) \times (1+.2867)$. It is important to understand whether model parameters are presented in arithmetic or geometric form.

A file with 10,000 pre-packaged scenarios is available for download from the AAA Web site. Also available is a scenario-picking tool to select smaller subsets of representative scenarios.



reality of periodically unstable markets, a high volatility distribution with "fat tails" is needed. From period to period, the RSLN model jumps from one regime to the other using a Markov process. Two-regime versions of these models describe the major American and Canadian equity indices quite well.

CTE methodology

While the CTE measure may be new to you, most actuaries will find the concept easy to understand. The key is to think in terms of distributions of results. While a general description follows, the actuary implementing this methodology should read the AAA reports for more details. The models start with the approximate starting reserve as the amount of initial assets. For each scenario, the greatest present value of the negative cumulative gains or losses at all future calendar year-ends during the projection period is calculated for the entire book of covered business. Results for all scenarios are then sorted for use in the CTE methodology. Because you start with initial assets equal to the

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Actuaries and the dark side of the moon

by Thomas Zavist

Children take great delight seeing objects first hidden and later revealed. To a child's mind an object that cannot be seen virtually ceases to exist. As adults, we know a hidden object is still there and probably has the same shape. The moon, for example, is always round, even when a portion of it is dark. An adult who sees a crescent moon knows the whole moon is round and does not imagine an invisible irregular extension on the dark side of the moon, simply because there is no visual evidence to the contrary. Likewise, an adult knows the moon will stay round for the foreseeable future.

trageurs will do this and make out like bandits, but some model the points of the yield curve as if they could move independently of one another.

The points of the yield curve must move in lock step (except for small deviations that would be arbitrage opportunities if it were not for transaction costs). The yield curve must be smooth at all durations. It must have no corners. If it is trending downward when the data run out, the curve keeps trending downward beyond the visible portion.



Suppose you do not want to project the yield curve flat after the data run out. What do you do? Two approaches come to mind. One is to fit a formula to the existing data and use the formula to extend the yield curve to all durations. The other approach is to project the yield curve flat after it reaches a maximum, even though there may be observable data to the contrary at higher durations. (See Figure 1.)

Accountants are beginning to consider requiring employers to model the yield curve in order to justify discount rates for long-term corporate liabilities, such as pension liabilities.

Many adults act childish, however, when they model the term structure of interest rates. Some carefully plot each spot rate yield as a function of duration. They observe a rounded curve that starts at duration zero and then rises up to a maximum at about 20 years and then curves down again smoothly to about 30 years' duration, at which point they run out of data. How do they extrapolate the yield curve? They draw a straight, flat line after the data stop, which puts a corner in the yield curve. (See Figure 1.)

Accountants are beginning to consider requiring employers to model the yield curve in order to justify discount rates for long-term corporate liabilities, such as pension liabilities. The government is thinking along the same lines for pension plan current liability. These liabilities may have durations well beyond the highest duration traded as an asset. Employers are turning to actuaries for help.

Extrapolating the maximum yield

Projecting the yield curve flat after it reaches a maximum will justify the highest discount rate. Therefore, the approach will be of greatest interest to most readers. Suppose you have a pension liability with a 60-year duration, for example—a single lump sum payment 60 years from now.

Others model volatility in the yield curve as if each point of the yield curve could move independently of all the other points. Were the 20-year STRIP to have a yield 80 percent of the average yield of the 19-year and the 21-year STRIPs, an arbitrageur would short the 20-year STRIP and would balance the position by going long on the other two. Adults know arbi-

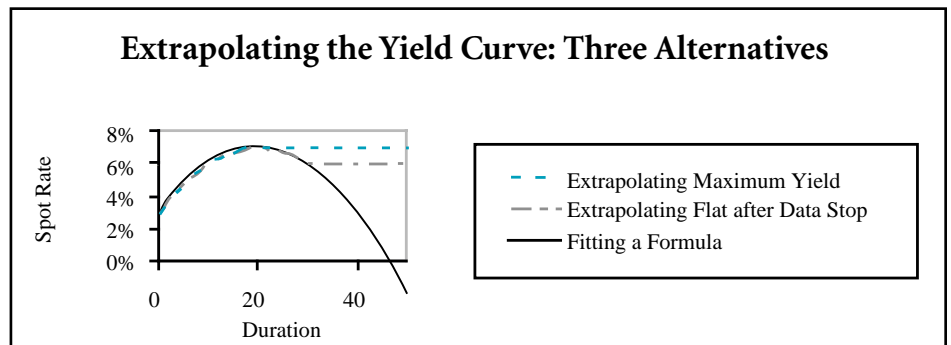


Figure 1

Suppose there is a 20-year STRIP with a yield of 7 percent and a 30-year STRIP with a yield of 6 percent. If these are your only investment choices, how would you invest a hypothetical asset to settle the liability? A prudent investor would choose the 20-year STRIP because it has a higher yield. If the yield curve looks the same in the future (and there is no guarantee) the prudent investor would reinvest at 7 percent for a second 20-year period and then a third 20-year period, earning 7 percent over the entire 60-year period. This is a justification for using a hypothetical asset with a 20-year duration to balance a liability with a 60-year duration. It might be a better investment.

Suppose the liability has a duration of 30 years instead, and there is a whole range of investment durations available, including the two illustrated above, but the 20-year STRIP has the highest yield. How do you justify buying a 20-year STRIP to balance the liability of a lump sum with a 30-year duration, when a 30-year STRIP is available at a lower yield? You say that you will sell the 20-year STRIP at some point 10-20 years from now and reinvest. If you time your reinvestment well, you hope to earn 7 percent over the entire 30-year period. Admittedly, it is a bit of hand waving, but there is some rationality to it. If you can justify a 7 percent discount rate for a 20-year liability and a 40-year liability and a 60-year liability, etc., why not use it for every duration in between? In any case, paragraph 44 of FAS 87 says “employers may also look to rates of return on high-quality fixed-income investments currently available and expected to be available” [emphasis added].ⁱ (Using the maximum spot rate at earlier durations, or the maximum forward rate, however, may be aggressive, since the beginning of the paragraph refers to benefits being settled.)

Fitting a formula to the yield curve

Although extrapolating the maximum yield may seem a stretch, the alternative is not pretty. Fitting a formula to the yield

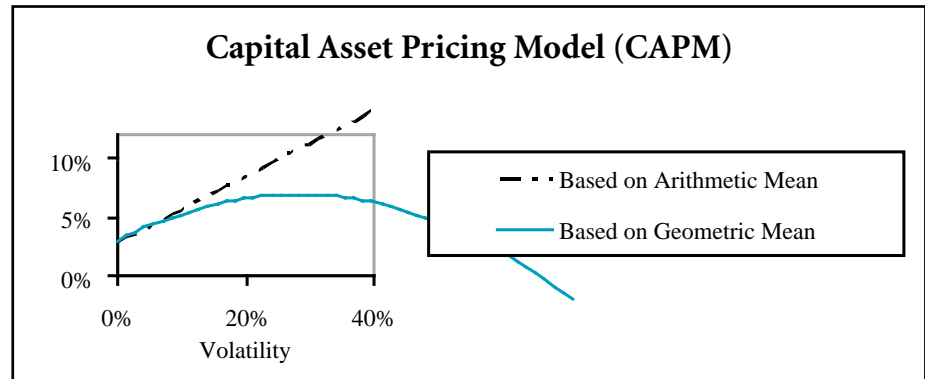


Figure 2

curve leads to a low discount rate assumption at larger durations.

To fit a formula to the yield curve, you first must recognize why a yield curve is rounded. Oddly enough, it is rounded because of the capital asset pricing model (CAPM), which requires return to be a linear function of volatility.ⁱⁱ The CAPM has to do with arithmetic mean return. Yield is a geometric mean return. If you hold a zero coupon bond from purchase to maturity, the geometric mean return will equal the yield on the bond exactly, but the arithmetic mean return will vary depending on interest rate movements between purchase and maturity.

Arithmetic mean return and geometric mean return are related, but they are not the same. The arithmetic mean return of any investment is larger than its geometric mean return by about half the square of its volatility. (This is a widely used rule of thumb, and it comes from the formula for the mean of a lognormal distribution in terms of the mean and volatility of the underlying normal distribution.) The CAPM postulates return as a linear function of volatility, but CAPM return is based on arithmetic mean return. If you subtract half the square of the volatility from the CAPM return to adjust it to a geometric mean, you change the line into a parabola, which is rounded. (See Figure 2.)

This is why the yield curve is rounded and why it has a maximum yield. Many

practitioners believe that the yield curve is rounded because of liquidity, but they may be mistaken. A popular explanation for the drop in spot rates after 20 years is that demand for long securities is strong, while the supply is weak, driving prices up and yields down. This paper, however, explains the shape of the yield curve strictly as a mathematical construct. The mathematics of the CAPM is enough to explain the rounded shape of the yield curve. The capital asset pricing model postulates no maximum return. There is no maximum CAPM return, and you can increase CAPM return indefinitely by increasing volatility, because CAPM return is based on an arithmetic mean, which you can graph as a line. By contrast, there is a maximum yield, because yield is based on a geometric mean, which you can graph as a parabola.

The yield curve is rounded like a parabola, but it is not exactly a parabola for two reasons. First, CAPM return is not exactly arithmetic mean return. It is related to arithmetic mean return by an exponential function. Second, duration is not exactly proportional to volatility. Thus, the yield curve, which is yield as a function of duration is a more complex curve than yield as a function of volatility, or CAPM return as

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Actuaries and the dark side

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a function of volatility. I will spare the reader a detailed derivation, but using one set of assumptions, the formula (see Figure 3) for the yield curve—spot rate as a function of duration—would be:

One of the assumptions leading to the formula above for the yield curve is that long-term expectations about inflation, etc., are the same as short-term expectations. If they are not the same, the yield curve may differ from the formula, and the

valued consistently with fixed income assets, you may require some liabilities to be valued in a preposterous way, e.g., using a negative discount rate, simply because for some liabilities there are no assets traded with a corresponding duration. For example, yield might be a spot rate of 3 percent for the shortest-term bills, rising to a maximum of 7 percent at a duration of 20 years and dropping to 6 percent at a duration of 30 years. If you extend the curve, you might find a yield of negative 9 percent at a duration of 60 years. How do you discount a liability with a duration of 60 years? Do you use negative 9 percent? Do you use 0 percent? Do you use 7 percent?

$$\exp \left[r - A \frac{e^{-Ku} + Ku - 1}{u} + B \frac{e^{-2Ku} + 2Ku - 1}{u} - C \left(e^{-Ku} + \frac{Ku}{2} - 1 \right) - Du^2 \right] - 1, \text{ where}$$

$$\frac{4B}{K} - \frac{C^2}{6D} \geq 0,$$

$$D \geq 0, \text{ and}$$

u denotes Macaulay duration.

Figure 3

The parameter r is a stochastic process, which causes the whole yield curve to shift up or down in parallel. The parameter A is also a stochastic process, which causes the yield curve to shift such that the high duration yields shift more than the low duration yields. The parameters r and A are related to the intercept and slope of the capital allocation line of the CAPM. If $u = 0$, then the formula collapses to $\exp[r] - 1$, which is the shortest term yield, i.e., r is the intercept of the capital allocation line. The parameters B , C , D and K are not stochastic processes. They can change smoothly over time, but they have no volatility.

The CAPM postulates a line, which is specified by two parameters. To the extent the line varies stochastically, it varies with two degrees of freedom. Likewise, the yield curve, which is based on the capital allocation line, varies stochastically with two degrees of freedom, i.e., its formula has two parameters that are stochastic processes (e.g., r and A). In other words, the points of the yield curve move in lock step. They do not move independently, and the yield curve keeps its rounded shape over time.

discrepancy will be more pronounced at lower durations.

The six parameters of the formula are not specified by theory. They must be fit to the data available. Six parameters give a very

If you require liabilities to be valued consistently with fixed income assets, you may require some liabilities to be valued in a preposterous way, e.g., using a negative discount rate ...

close fit. Often, the formula will extrapolate a yield that is negative at large durations. Although a negative yield would represent an arbitrage opportunity, there is no arbitrage opportunity to the extent no assets are traded at the large durations.

This leads to an important philosophical conundrum for accountants, as they grapple with using a yield curve to value corporate liabilities, and regulators and congressmen, as they grapple with current liability. If you require liabilities to be

Another possibility is to fit a formula that is never negative. If you constrain the yield curve to be nonnegative at all durations—even durations that are not traded—you force the parameters r , B , K and the expression $r - AK + 2BK$ to be non-negative, and you force the parameters C

and D to zero. As a result, the slope and intercept of the capital allocation line become perfectly correlated, and all bonds become perfectly correlated. This creates a tidy theory for valuing liabilities, but it does not quite fit the facts, since assets are not traded at all durations and the formula may not exactly fit the data if $C = D = 0$, etc. The shape of the yield curve at the observable durations is not consistent with what the yield curve would be if assets were traded at all durations.


Conclusion

Most readers, who want to justify as high a discount rate as possible, can use the formula for the yield curve as an indirect way to justify extrapolating the maximum yield. (See Figure 1 on page 6.) In particular, if you do not extrapolate the maximum yield, then you are forced into one of three arguably unreasonable options. Either you put a corner in the yield curve, or you extrapolate down to a negative interest rate or you have a yield curve that does not quite fit the available data. You can justify extrapolating the maximum yield by postulating reinvestment under like economic conditions.

Unlike most readers, the odd reader who wants to justify as low a discount rate as possible can use the formula directly. If a negative yield is too low, the parameters can be adjusted so yield is never negative.

Valuing liabilities at durations higher than any traded assets puts an actuary into uncharted territory. Modern theories of financial economics, such as the capital asset pricing model, can help an actuary plot a reasonable course, even on what seems like the dark side of the moon.

ⁱ Financial Accounting Standards Board of the Financial Accounting Foundation. 1985. *Statement of Financial Accounting Standards No. 87 Employers' Accounting for Pensions*. Stamford, CT: Financial Accounting Standards Board.

ⁱⁱ Bodie, Zvi, Alex Kane, and Alan J. Marcus. 1986. *Investments*. 3rd ed. Chicago: Irwin. 

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Look for your copy of the April 2004 issue of the NAAJ


The April 2004 issue of the *NAAJ* is host to many talented researchers who present articles on developing areas of interest, original research on timely issues and useful information for regulators, policymakers, practicing actuaries and health plans. There's an article of interest for everyone!

In "A Note on the Myers and Read Capital Allocation Formula," Stephen Mildenhall presents an overview of the Myers and Read result, explaining its significance to actuaries and providing a simple proof. Manuel Morales presents an approximation to the surplus process based on a Levy process with an underlying Levy measure, proportional to the generalized Pareto distribution, in his article, "On an Approximation for the Surplus Process Using Extreme Value Theory: Applications in Ruin Theory and Reinsurance Pricing." Wenge Zhu discusses two approaches that set the risk-based capital (RBC) factors and the examples illustrating the improvement of one over the other in his article, "Risk-Based Capital Factor Determination with Jump Risk." In "Optimal Investment for an Insurer to Minimize Its Probability of Ruin," authors Chi Sang Liu and Hailiang Yang, study optimal investment strategies of an investment company.

In their article, "Projecting Mortality Trends: Recent Developments in the United Kingdom and the United States," Carlos Wong-Fupuy and Steven Haberman develop a comprehensive review of the sustained reduction in mortality rates and its systematic underestimation which has attracted the attention of researchers in recent years.

Harry Sutton, Roger Feldman and Bryan Dowd review the movement among multiple health plan options between 1994 and 1998, for Minnesota state employees whose work site was located in the Minneapolis/St. Paul metropolitan area, in their article, "Research Note Disruption of a Managed Competition Environment by Low-Ball Premium Bids: The Minnesota State Employees Group Insurance Program." Robert Brown and Uma Suresh provide further research on future health care costs, the impact wide use of advance directives might have on these costs and the differentiation between the two in their article, "Further Analysis of Future Canadian Healthcare Costs."

Gary Venter's contribution is a selection from the 2003 Bowles Symposium. In his article, "Capital Allocation Survey with Commentary," a number of methods of allocating capital to business unit are discussed.

The *NAAJ* editorial staff encourages readers to pick up their copy of the April 2004 issue and discover the exceptional research. Those interested in submitting a discussion for publication consideration in a future issue should contact Kimberly J. Wargin, editorial assistant, at kwargin@soa.org. Abstracts of these articles are available on the *NAAJ* Web page at http://www.soa.org/bookstore/naaj04_04.html. For copies of an article in its entirety, contact Kimberly at the above e-mail address. 

Russia's pensions reform loses time

by Rachel Stott

Editor's note: Over the last several years, Russia has had to grapple with public pension reform, facing issues that they share with us in North America, as well as unique problems related to their transition to a market economy.

The Russian government has just passed a ruling delaying the implementation of the latest part of its ambitious pension reforms. The issue? Less than two million of the 40 million required benefit statements had been produced by the deadline. The only real surprise is that the government had been insisting, as recently as the previous month, that things would run to schedule. This was despite the latest World Bank economic report prepared for the Russian government, which highlighted concerns about sustainability and the capacity of Russia's financial markets and social security administrative systems.

Progress has, however, been made. The majority of the framework legislation is now in place, although many of the details are still to be flushed out. This article discusses the background to the reforms and why they were needed, the fundamental changes that are happening and the changes that are still needed if the reforms are to succeed.

Traditional pension provision

The Russian Federation, with a population of some 145 million people, spans 10 time zones covering 89 member states, each with its own legislature and budget. Each state has its own industry, climate and culture. Yet, despite this diversity, pension provision has been the same for all, with normal retirement ages of 60 for men and 55 for women, and a target pension of 75 percent of earnings. A full pension is payable after 20 or 25 years of service, which can include periods of higher

education, military service and maternity leave.

Under the communist regime, it was illegal to be unemployed. Pensions delivered post-retirement living standards matching those pre-retirement. Post-communist Russia in the early to mid-1990s tried the sink-or-swim approach to transition to a free market economy. It hit a rock in 1998 with the government debt payment default. The resulting hyperinflation led, in many cases, to a total loss of savings and the population's mistrust of both state and private financial institutions. This is stalling the growth of Russia's economy, as there is currently very little private investment. Income (in roubles) is routinely converted to dollars and stored under the bed rather than in banks. Russia is in fact the world's second-largest dollar economy.



The Russian Federation, with a population of some 145 million people, spans 10 time zones covering 89 member states, each with its own legislature and budget.

Hyperinflation caused a swift and dramatic erosion in the purchasing power of pensions. Many pensioners suddenly found themselves with incomes below subsistence levels. New laws were introduced in 1998 to try to address this, but without much success. The majority of Russian pensioners live at or below subsistence levels, with the state pension amounting to around \$20 per month.

A new system

Government projections showed that the system inherited in the 1990s was rapidly becoming unaffordable. Either social taxes would have to climb to 60-70 percent of

pay, or benefits would be cut to levels that would put the majority of pensioners below the poverty line.

The government therefore wanted to encourage a move away from total reliance on state benefit provision. Legislation passed in late 2001 introduced major reforms to the state pension system effective from 1 January 2002, including a funded element. The government is in the process of legislating for the involvement of the private sector. Table 1 on page 11 shows the components of pension provision under the reforms. Those shown shaded in teal are the state elements; those

in white are the elements provided by employers.

As in the previous system, the Pension Fund of Russia is at the centre of formal

The government is aiming to introduce legislation making it mandatory for employers in certain industries to fund early retirement pensions.

provision for old age and, for now, remains responsible for the administration and payment of all pensions under the reformed system. Pensions are financed through the unified social tax, a payroll tax levied on employers and collected by the tax office. Of the total 35.6 percent social tax rate, 28 percent is used for pension purposes. Of this, 14 percent is allocated to finance the basic pension and other social pensions on a pay-as-you go basis, and 14 percent finances the notional (also pay-as-you go) and funded elements.

The government is aiming to introduce legislation making it mandatory for employers in certain industries to fund early retirement pensions. It is currently envisaged that this funding will be done in a way similar to that of the funded state defined contribution pension. Currently more than 20 percent of employees (including public sector workers, workers in hazardous and arduous conditions, and

workers in the far north) have at least some right to early retirement, the cost of which is met by the Pension Fund of Russia via the unified social tax. However, this is a contentious issue that is unlikely

to be addressed before the Duma elections later this year.

Finally, the government wants to encourage non-state provision by creating opportunities for the long-term tax-efficient reward of employees, and encouraging employees and employers to make further provision for retirement. In the longer term this is envisaged in two ways:

- **Voluntary provision**

There are currently fewer than 250 non-state pension funds in Russia, many of which are not operational. A handful of these, mostly associated with the industrial conglomerates (such as Lukoil and Gazprom), offer defined benefit pensions.

- **The state-funded element**

It is hoped that eventually employees will choose to invest the funded element of the state pension with private investment managers and/or non-state pension funds.

Investment and regulation

Russia employs Europe's biggest workforce and is the home to Europe's largest army of pensioners. Hence the reformed pension system will command substantial financial flows: the first quarter contributions deposited on individual pension accounts totalled circa \$250 million. It is estimated that the accounts will accumulate more than \$1 billion within a year, and then a further \$1 billion to \$3 billion

Russian pension reform—update

This article was first published in November 2003. Since then, the Russian pension reform has been a changing scene. It is now known that only 2 percent of employees elected to transfer their state pension fund to a private investment manager. The Government had been hoping for 5-10 percent.

Part of the problem is miscommunication—coupled with misunderstanding—of the options. Two other factors that come into play are continued mistrust of the private sector and employee apathy—at the moment, the individual amounts that have been contributed are very small. It has been said that the Government has not been proactive enough in helping the 55 private asset managers authorized to take pension fund money to raise awareness of the opt-out.

New legislation is being prepared, but there are wider political machinations in Moscow that may still mean that the reform is not as successful as its supporters had originally hoped.

annually in the future, without taking into account the investment return on the pension assets.

These funds are all currently invested with the Pension Fund of Russia. Fifty-five investment managers have just received approval to manage these funds. The race is on to attract employees—who can choose from these managers—and their funds. This is the part of the timetable that has slipped: originally the funds had to be transferred from the pension fund before 31 December 2003. In theory, this

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The government's plan for pension provision
Voluntary occupational pension
Mandatory occupational pension (early retirement provision for those in specified industries)
Funded defined contribution pension
National defined contribution pension
Basic pension

Table 1

The long and winding road ... highlights of the Society of Actuaries Vancouver Financial Economics Symposium

by Jon Exley

Editor's note: It is our continuous goal to present a wide variety of viewpoints in The Actuary. This article, "The long and winding road ..." offers a view of the conference in Vancouver through the eyes of a UK actuary.

The North American Society of Actuaries reflected the growing debate on financial economics inside our profession with an entire session on the subject at its Vancouver spring meeting, held in late June. The session was aptly titled, "The great controversy" (subtitled 'Current pension actuarial practice in the light of financial economics').

It was suggested that if the accountants had regrets about the current state of pensions accounting, they were nothing to do with the parts taken from financial economics!

The seminar was, in part, prompted by the provocative paper "Reinventing pension actuarial science" published earlier this year by Jeremy Gold and Larry Bader in the Society's *Pension Forum*. The arguments in this paper may be familiar to UK actuaries. It advanced the proposition that, when viewed from the perspective of modern (post-1950) corporate finance, the conventional actuarial wisdom of the 1980s and 1990s has a number of serious flaws and the paper argued instead for a framework paying more regard to market values.

Contributions from the United Kingdom

The session received presentations by speakers from around the globe, including

a large UK contingent (Tim Gordon, Stuart Jarvis, David McCarthy, Jon Palin and Cliff Speed) that contributed over a fifth of the papers discussed. Indeed, this prompted a recurring, if rather unusual, comparison between the UK actuaries and the Beatles (the North Americans claimed not only to have given us rock and roll but also to have invented financial economics, which we were now simply playing back to them).

Aside from the contributions from the UK, the sessions included a powerful endorsement of modern market-based pensions accounting by Mark Ruloff, who likened the move towards market

accounting as an unstoppable train. He argued that the accountants had applied the "wisdom of Solomon" in establishing the current U.S. pensions accounting framework, and simply taken half of the accounting standard from financial economists (regarding discount rates) and the other half from actuaries (regarding the complex smoothing and amortisation rules). It was suggested that if the accountants had regrets about the current state of pensions accounting, they were nothing to do with the parts taken from financial economics!

The U.S. experience

Edward Burrows, an elder of the U.S. actuarial profession who has lived through the development of the complicated ERISA rules, gave a particularly



enlightened contribution that illustrated the common ground between very traditional (or "classical") actuarial theory and modern financial economics. He argued that the reason for the existence of the complex rules and indeed, the Pensions Benefits Guarantee Corporation (PBG), would disappear if funds were required simply to maintain 100 percent solvency on an old-fashioned wind-up basis. This is a lesson that perhaps the UK government could learn as it dwells on complicated premium structures for the Pension Protection Fund, and grapples with the difficulties of enforcing buy-out shortfall pension debts on subsidiary companies within existing UK and international company law. A lunchtime talk by Steven Kandarian, executive director of PBGC, also appeared to be broadly supportive of these financial economic principles, while remaining diplomatic as far as the political aspects were concerned.

While making it quite clear that her views were personal and not necessarily those of the "Fed", Julia Coronado delivered some thought-provoking results of research undertaken at the Federal Reserve Board suggesting that opaque actuarial accounting may have been partly responsible for

Your input is needed! Research project to study regulations that restrict actuarial job opportunities

Are you aware of regulations that hamper your ability to apply your actuarial skills in new areas? Certain legislation has been perceived to exclude or restrain actuaries from working in certain areas in which actuarial skills are applicable. The Task Force on the Personal Actuary has received complaints from actuaries indicating that some legislation may restrict their employment options. We need your input to investigate such claims.


This research project has been initiated to study regulations that restrict actuarial job opportunities. The ultimate goal is to help actuaries compete in new fields, incorporating unconventional uses of actuarial work. The Committee on Finance Research is funding this initial research project, which includes a limited legal review to try and determine the scope of this problem.

Please send information about legislation that may unnecessarily restrict actuarial work—be specific as possible regarding details. Actual copies of sections of legislation or regulations including references would help us proceed quickly with a legal study.

We need actuaries' opinions regarding harmful legislation to help the timeliness and effectiveness of our study. If such legislation actually does serve to narrow actuarial opportunities, we will estimate the scope and potential cost of a more extensive legislative review. If the limited project determines that an extensive legal review is warranted, funding options will be explored. Your input will help us determine "key terminology" that will help us conduct more extensive legislative searches if warranted.

With the help of legal consultants, The Finance Practice Area Advancement Committee will spearhead a review of the legislation and/or regulations that are referred to us. Other SOA committees, task forces and/or section councils will be consulted as necessary, depending on the nature of any legislation or regulation that may be harmful or restrictive to actuaries.

Please send information on legislation and/or regulations to:

Finance Practice Area Advancement Committee
c/o Teresa Winer, FSA, MAAA
Chair, Task Force on the Personal Actuary; fax 404.816.1806
Mailing address: 342 King Road NW, Atlanta, GA 30342. 

Symposium highlights

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creating a bubble in equity prices. The financial economist Zvi Bodie, as ever, gave an entertaining presentation of the fact that equities do not become less risky over longer time horizons. Of course the application of the market value paradigm to defined benefit pension funds is relevant whether or not this risk reduction applies, but his comprehensive demolition of such a major pillar of received actuarial investment wisdom was another highlight.

Arguments against financial economics

The main speaker advancing arguments against financial economics and in favour of smoothing market values was Eric Kleiber. He likened financial economists to communists, and advanced a framework familiar to UK actuaries, where


professional judgment as to the "value" of a financial contract is of more relevance than the rigid market valuation doctrine.

From a UK perspective, the debate in Vancouver seemed rather subdued. Possibly there was a silent majority in the audience totally bemused by the financial economics argument, but I don't think so. Certainly, talking to delegates, there are many issues in common with the UK concerning acceptance of the theory. However, one theme which many delegates returned to was that North American actuarial science had never completely forsaken market valuation principles, and therefore the ideas were far less foreign to them than was the case in the UK. Furthermore, several delegates also noted that the North Americans had

never adopted (and had always been puzzled by) the dividend discount model as a means of arriving at off-market asset and liability valuations. Whether the symposium encourages them to reinvent (or perhaps rediscover or reinvigorate) their actuarial theory in the light of financial economics remains to be seen.

All conference papers are available at http://www.soa.org/sections/pension_financial_econ.html.

Jon Exley is a senior consultant with Mercer Investment Consulting

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How to be a superstar in your own company

by Aimee Kaye

Will 2004 be filled with downsizing, consolidations, mergers and acquisitions? What can you do to insure having a position in your own company during times like these? How can you stand out among your peers, insure you get that promotion or the job you want in your own company? Here are some important strategies to help you differentiate yourself from your peers, and insure your own marketability and advancement within your own company.

One way to set yourself apart is to become more productive by not only adding value to your company's bottom line, but also by adding value to your community of co-workers as well. This will insure your marketability and mobility within your own organization.

Think about your fellow employees right now ... who are the superstars, the young rising stars and the more seasoned actuaries? They are not necessarily brighter than

Being more productive doesn't necessarily mean more hours of work; it means getting more out of the hours you work.

you. They do not have extra brainpower. They just work differently than the average actuary and use work strategies that lead to higher productivity. Increasing your own productivity can make the difference between getting a promotion, being stuck in a dead end job or having no job at all.

Achieving lower productivity is not because you are necessarily less capable. It may be because you were never taught the work strategies that lead to higher productivity. Being more productive

doesn't necessarily mean more hours of work; it means getting more out of the hours you work. We are looking for ways to become more productive while still being able to spend quality time outside of work with family, friends or on hobbies. Superstars often work fewer hours than average performers because they get so much critical work done in less time. How do they do it?

Mastering "star performer" skills and work strategies is simply a matter of learning these techniques and practicing. But first, you have to be aware of what they are, so let us discuss them now.

The first, and most important technique, is taking the initiative. Taking initiative is very powerful, yet also easily misunderstood. Average performers, who account for 60 to 80 percent of the work force, view taking initiative as going beyond their job description, learning something extra so that they are seen as very smart technically or getting stuck doing some-

one else's work or taking on work not part of your job description. Average performers are cynical and see this as "kissing up" to the boss or colleagues.

Star performers also seek out responsibility above and beyond their expected job description. The difference, however, is that their extra efforts are for the benefit of their company and co-workers, and not self-serving. True initiative, as practiced by star performers, always ends up benefiting someone else: co-workers, the department or the entire company. While



it is true that exemplary performance does indeed benefit the star, the primary emphasis is always on the greater group, and not on individual recognition.

An initiative must also be implemented. Star performers stick tenaciously to an idea or project and follow it through to its successful completion. Don't just send your boss a memo about your great idea and think that you are taking the initiative. That falls short. Too often average performers assume their responsibility ends with presenting the idea and it is the boss' responsibility to make it happen. Implementation is the acid test of any initiative, but doesn't necessarily mean that every initiative you undertake will be successful. No one expects that. However, nothing will happen unless you try. And while trying can be hard at times, it is often what people expect.

Another important element of taking initiative involves the risk in choosing the right initiatives to undertake. To minimize these risks, make sure you take the following steps:

1. Do your current assignments well. Your first obligation is to do your assigned job. Avoid over-committing.

2. Make sure the initiative has some payoff for someone other than yourself—if there is nothing in it for someone other than yourself, do not call it an initiative.
3. Initiatives that can be related to the bottom line in terms of increased profitability or decreased costs are generally more significant than, for example, improving the company's food service.

In becoming adept at taking initiatives, one learns quickly that efforts don't need to be brilliant to have impact. Taking the first step and then finding a solution will most assuredly increase your value within your company.

The second important skill exhibited by star performers is the ability to increase productivity through networking.

Average performers think that building a communications grapevine insures that they are "in the loop" on the latest office gossip and that socializing with other people in their field and executive recruiters can help in future job hunting. While this may be true, here networking is referred to as a tool to increase your value within your own company.

Star performers know that in this age of knowledge-intensive jobs, without a good network supporting them, they are on their own. They also know that to be on their own in this mind-boggling universe of technical knowledge is to be lost, and working in a vacuum.

What percentage of knowledge is stored in your own mind? Can you quantify how much information you need to know to perform your job? In the 80s, most technical people would have said 75 percent of knowledge is stored in their brain. Today that figure has dropped 20 points or more.

Knowledge-based networks are one way that star performers overcome their deficiencies. Networks are high-speed infrastructures upon which knowledge is sent and received by those who need it. Without these networks, professionals cannot do their jobs properly. Star producers proactively develop dependable pathways to knowledgeable experts who can assist them with critical business tasks. When called upon, these "experts" share their knowledge with those who

In becoming adept at taking initiatives, one learns quickly that efforts don't need to be brilliant to have impact.

need it. The goal is to minimize the knowledge deficiencies that are inherent in every brain-powered job.

Another facet of the economy contributing to knowledge deficiencies is downsizing. Those who survive in companies that have undergone significant cuts in their workforce are expected to do more with less manpower. They assimilate jobs that were once the full-time responsibility of others. Sometimes the increased workload is juggled by teams of workers. Even those downsized from one workplace are expected to work longer hours with a heavier workload in their next job.

Let's look at the benefits of networking from another angle. When given an assignment which is beyond the scope of your experience, you have two choices:

1. The do-it-yourself approach. Get up to speed by taking a quick study course and cramming the information you need to get the job done yourself.
2. Work your network, gather the best ideas from your network and combine that information with your own knowledge base to get the job done.

The first option is frequently the path of choice for average performers, but it is the worst option for maximizing productivity, even though it follows the educational patterns ingrained in us from our school years. By working an established network, you can close your knowledge deficit quickly, which clearly beats out the "do-it-yourself" option in both effectiveness and efficiency.

Take the time to develop a network of experts. Remember, the worst time to build a network is when you already need the network to work for you. Star performers try and get their networks in place before they need them. Star performers want to assimilate these sought-after experts into their networks and will be proactive in offering to help to them long before they need to be on the receiving end. They build bridges to these experts in advance and use their network to get the job done effectively and efficiently.

Self-management skills are the next area of concentration. Have you noticed that star performers enjoy what they are doing? Star performers have used their self-management skills to put themselves into work that they enjoy and that complements their personalities. The result is that their careers are more satisfying. Long term, star self-managers exhibit a sense of meaning, accomplishment and contribution. They get the job done, and they do it well.

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Where's the change? Update from Strategic Planning

by Mike Kaster, FSA, MAAA, MBA

What does it take to change a profession? Recently the Society of Actuaries' Strategic Planning Committee (SPC) has been exploring this question in depth. One thing is certain—change never comes easy, especially for a profession filled with individuals who are, for the most part, risk averters. To make a change in your own personal career is difficult enough as it is. In my own career, I have made several changes. None of them was easy to make, but in the end each one helped me take another step forward.

This is similar to where we find our profession. Our traditional roles and our traditional industries are not growing as in the past. The life industry continues to experience consolidation, resulting in fewer and fewer actuarial roles. The health industry is facing considerable cost pressures, which has left actuaries searching for new ways to add value to the system's stakeholders. The pension field is in its own crisis, with the future of the defined benefit plan in serious question. Not only are traditional opportunities within these markets declining, roles in risk management and investments within traditional firms are being infiltrated by other professionals, including those obtaining credentials from the Global Association of Risk Professionals (GARP) and the Professional Risk Management International Association (PRMIA). In

short, we, as a profession, can no longer rely exclusively on traditional roles and markets for employment opportunities. This has been the conclusion of the SPC.

So, if our profession and the skills we bring to the table are to remain vibrant, it is essential that we explore new arenas for possible application of the actuarial skill set. The leadership of the SOA has deter-

So, if our profession and the skills we bring to the table are to remain vibrant, it is essential that we explore new arenas for possible application of the actuarial skill set.

mined that we should support growth of the profession into new industries and fields. This will help us to continue to remain vibrant, relevant, and for our skills to be desired. Our credentials have value where they are known; our task is to get other fields and industries to discover this value and seek the credential.

For many years now, the profession has debated the merits of expansion into "wider fields"—

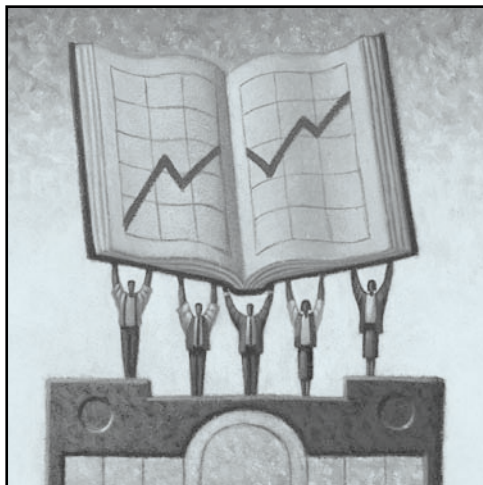
those areas perceived to be new ground for actuaries. A special section of the SOA was formed several years ago with the express purpose of helping actuaries as they individually pursue growth into new areas. The Actuary of the Future section

has a "Career Pioneer" program that showcases those groundbreaking actuaries who "boldly go where no actuary has gone before." These pioneers are true risk takers, and the SOA is greatly benefiting from their insights. We all need to learn from these pioneers.

In its ongoing effort to maintain the long-term growth and vitality of the profession,

the Society of Actuaries has spent the last several years scanning the horizon to explore new arenas for the application of the actuarial skill set. The major challenge was deciding where to start. After completing in depth research into areas of growth, the SPC recommended to the Board of Governors that the best opportunity with the most potential impact to the profession would be to expand into the broader financial services (BFS) industry, which includes the mutual fund companies, asset management firms, commercial and investment banking firms and other financial services firms. There are many reasons why this was chosen, not the least of which was the fact that there is significant consolidation occurring between the BFS market and our traditional insurance markets.

The banking and investment management area of practice is the fastest growing area for the profession. The number of members working for banks and investment advisory firms since 1990 has experienced an annual compound growth rate of over 15 percent. If this rate of



growth continues, this industry segment of our membership will have nearly 1,500 members by the year 2015.


Expansion into new markets will benefit all actuaries, not just those who work in the new areas. A broader and more diverse profession means that all members will have more opportunities for learning and growth. There is also a perception that the broader financial services markets are a bit more cutting-edge and exciting than our traditional fields, which will help us attract more of the “best and brightest” into the profession. Our profession’s image needs to evolve to being a “desired” profession for the best and brightest. When this occurs we will have a more valued credential to employers, thus

improving the value of the FSA/ASA to all members.

The challenge that lies ahead is to position the actuarial profession for success in the BFS markets. There are several steps needed to accomplish this. One of the first steps is to help potential employers recognize the value of actuarial credentials. We need employers to see us like they see MBAs—as versatile, well-rounded professionals. When they read FSA or ASA on our resumes, we want employers to recognize us as risk management professionals who are skilled at providing expert advice and relevant solutions for a wide variety of financial and business problems. And as we are able to successfully move into the BFS market, which offers us with one (albeit tremendous) opportunity, the SPC

recognizes that this market represents the first of several that can provide us with growth prospects. Other nontraditional opportunities can and will also be explored relative to other areas of practice, including the health and pension fields.

At this point, the SPC is working to create a market development plan to expand the profession into the BFS market. This is supported by the Board, and is based on the research conducted over the last couple of years. For further information on the research, the Strategic Plan, and the direction of the profession, visit the SOA Web site at www.soa.org.

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Russia’s pensions reform

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will now happen in early 2004. Conspiracy stories of the Pension Fund of Russia’s intent to hold on to funds for as long as possible abound.

For those who do not elect a specific investment vehicle, a default asset manager has been selected with a strategy to invest in a prudent fashion.

For those who do not elect a specific investment vehicle, a default asset manager has been selected with a strategy to invest in a prudent fashion. Prime Minister Kasyanov stepped in in March 2003 to appoint Vneshekonombank—or VEB—the government’s foreign debt agent. Critics have commented on the possible conflict of interest, as VEB will presumably invest the pension money in government bonds.

The framework legislation contains provision for limits on investment strategies,

including asset classes and investment in international markets (only allowed via index-tracker funds). Regulation of many of the financial markets is still required.

Much of the outstanding legislation concerns the investment of funded pensions. Regulatory control, corporate governance, administration and annuity-markets still need to be addressed.


Where next?

Another area of legislation still required is the conversion of accounts to pension. Russia does not have an annuity market, so no open-market option exists. The legislation provides for the government to specify a life expectancy with which the Pension Fund of Russia will calculate the

annual pension. The government is currently investigating its options.

And, say it quietly, will retirement age be on the agenda after the elections?

Rachel Stott is an actuary in PricewaterhouseCoopers’ human resource services; in 2002, she was based in Moscow for six months on a Tacis-funded project to assist the Russian Ministry of Economic Development and Trade on aspects of the reform of the Russian pension system.

Reprint permission granted by the author Rachel Stott. The article first appeared in the November 2003 issue of the UK’s magazine, The Actuary. 

In memory of Jack Moorhead



E.J. (Jack) Moorhead
FSA, MAAA, AIA

E.J. (Jack) Moorhead, FSA '38, MAAA '65, AIA '71, passed away on February 21, 2004. He was 94. Moorhead was born in Winnipeg, Canada on January 23, 1910, and graduated from the University of Liverpool.

He began his actuarial career at Great-West Life in 1929. He was with a predecessor of the Life Insurance Marketing and Research Association (LIMRA) from 1945-48. Following this, his career included working for United States Life in New York City, New England Mutual Life and Integon in Winston-Salem, North Carolina in 1972.

After his retirement from Integon, he participated in public interest activities, including advisory work for the U.S. Senate Subcommittee on Antitrust and Monopoly and two studies of the financial problems of the Social Security system. Moorhead also was involved in devising ways to compare attractiveness of life insurance policies, magazine editing and speaking to various groups about insurance and social security.

He served as SOA president (1969-70) and as president of the American

Academy of Actuaries (1973-74). He also served the SOA as chair of the Committee on Memorials as well as the Committee on Papers, and as editor of *The Actuary*.

truly loved the actuarial profession and all the people in it. He will be missed by many."

—Edward F. Cowman, FSA, MAAA, FCA

We are fortunate to work in a profession with a lot of heroes—for me, Jack was, and is, the number one hero. He exemplified the virtues of the actuarial profession.

He wrote, "Our Yesterdays: the History of the Actuarial Profession in North America, 1809-1979," published by the Society as part of the profession's centennial celebration in 1989. His dedication reads, "To actuaries of all lands who have struggled mightily to create and maintain a profession worthy of public trust."

"We are fortunate to work in a profession with a lot of heroes—for me, Jack was, and is, the number one hero. He exemplified the virtues of the actuarial profession. He had an astounding intellect and a principled approach to any endeavor he undertook. I am truly honored to have known this wonderful man."

—Dwight K. Bartlett III, FSA, MAAA, FCA,
SOA past president, 1983-84

Moorhead published several papers, discussions and book reviews in the *Transactions*. Most recently, he served as a member of The Continuing Care Retirement Community Experience Task Force, which was formed to provide an oversight function for the Continuing Care Retirement Community Experience Project funded by the National Institute on Aging.

He was married to the late Iris Moorhead. He is survived by Patricia (daughter) and Richard MacKinnon; Anthony (son) and Donna Moorhead; Sheila (daughter) and the late Terence Kelley; four grandchildren, four step grandchildren and one great grandchild. A memorial service was held in Hanover, N.H.

"I got to know Jack when he was working on 'Our Yesterdays' ... he asked me to prepare the index. Through our association, he became a mentor and a good friend. He was a true gentleman, a stickler for detail and a professional in every sense of the word. He

The family has requested that donations be made to The Actuarial Foundation. Visit the Foundation's Web site at <http://www.actuarialfoundation.org/donor/memory.htm>. Or send donations to The Actuarial Foundation, 475 North Martingale Road, Suite 600 Schaumburg, IL 60173-2226. Those with questions about the donation procedure should call the foundation office at 847.706.3535.

Condolence cards may be sent to Moorhead's daughter, Sheila Kelley, at 3376 Turtleback Road, Gainesville, GA 30506.

Principles-based regulation ...

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approximate starting reserve, you start with 0. This effectively floors the result for each scenario at 0. You can't reduce the approximate starting reserve based on testing.

It helps to consider an example. Take a distribution of 100 scenarios where the results range from -3 to 96 when placed in ascending order. Negative numbers mean that additional assets are required. (Think of it as a series from 1 to 100 with each scenario result being 4 less than the corresponding scenario number, or $y=x-4$.) Let's assume the tail we are interested in is the worst 10 percent; in this case, the worst 10 scenarios. This defines CTE 90. Since the individual scenario results are capped at zero, the worst 10 results are -3, -2, -1, 0,0,0,0,0,0,0. The CTE 90 result is the average of all these results, or -0.6 (-6/10). You would hold 0.6 units beyond the approximate starting reserve of the tested liabilities to calculate TAR.

Total Asset Requirement (TAR)

The recommended TAR uses 90 CTE, with reserves set at 65 CTE. RBC is determined from TAR by subtracting the resulting statutory reserve plus an adjustment for tax reserves in excess of the cash value and for the admitted statutory deferred tax asset. The calculated reserve defines the capital requirement as the residual (thus a higher reserve results in an offsetting lower capital amount).

The recommendation combines these results with the common stock component, C-1cs, of the RBC covariance formula, when the various parts of the RBC requirement are consolidated. (The formula assumes that C-2 risk and combined C-1 and C-3 risk are independent and uncorrelated. The covariance formula quantifies diversification benefits between these risks.)

Alternative Method

The Alternative Method allows companies with death benefit guarantees (i.e., not living benefit guarantees) the option of applying factors to those contracts rather than running stochastic projections. Four sets of factors are being produced—combinations of two different mortality bases and two types of calculations (reserves and TAR). Geoff Hancock, FSA, FCIA, of Mercer Oliver Wyman, has led the work for this effort. Three components will need to be developed for each

A standard scenario would help regulators with auditing, but could mean an entirely distinct calculation from the one used for scenario testing.

contract, with the sum added to the cash surrender value to determine the TAR or statutory reserve. The first two components are generated with company specific information: one amortizes the unamortized surrender charges, using dynamic lapse rates based on how much the contract is "in-the-money," and the other provides for fixed expenses less fixed revenues (e.g., per policy expenses and per policy charges). The third component provides for the cost of the guaranteed minimum death benefits, less net available spread-based charges. It has 80,640 variations based on combinations of the following attributes: six product designs (return of premium, two rollups, a one-year ratchet, the higher of a one-year ratchet and a rollup and an enhanced death benefit), two GMDB partial withdrawal provisions (proportional and dollar for dollar), eight asset classes, eight attained ages, five contract durations, seven "in-the-money" levels (measured as the ratio of account value to guaranteed value) and three margin levels (all asset based product charges and mutual fund allowances, if any). The AAA is providing

the pre-calculated factors and software to perform the necessary interpolations.

The factors are applied one policy at a time, or seriatim, with no diversification benefits between policies. The *simplicity* of applying factors, rather than performing stochastic modeling, will likely result in larger reserves and TAR. In an aggregated model, where policies with offsetting risks are allowed to interact (effectively acting as one big policy), the projected risks offset each other in part since the CTE

measure is applied to the array of largest present value of future cumulative aggregated loss for each of the scenarios.

Remaining issues

The NAIC continues to discuss whether to use a floor for reserves or TAR, and what level of conservatism the floor would assume. One proposal incorporates a predefined standard scenario and would floor the statutory reserve for each contract on a seriatim basis, offsetting some of the benefits of risk reducing product designs. A floor that is too high might also discourage quality modeling. It might, however, help align the reserves with the requirements of the tax code and facilitate the allocation of the reserves to the contract level. A standard scenario would help regulators with auditing, but could mean an entirely distinct calculation from the one used for scenario testing. Other issues include possible year-to-year volatility of the results, initial implementation and how to implement using data based on business in-force

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how to be a superstar

How to be a superstar

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The key to self-management is:

1. Know yourself well.
2. Know the kind of work you do best and identify the type of work you enjoy.
3. Take control of your career path by developing a plan to connect yourself to the work you enjoy most with a job that increases productivity for your company.

Seeing the “big picture” is another idea which delineates average performer from stars. The big picture involves thinking outside the box, looking at a situation from other perspectives and being creative.

Average performers have a one-dimensional perspective of seeing work from their own point of view and making sure that their point of view is the one that

gets the most attention, protection and connection.

Star performers know it is the multi-dimensional perspective that allows them to see a project or problem in the larger context, whether they are customers, competitors, co-workers or bosses.

Maintaining a broad perspective enables stars to evaluate the relative importance of various viewpoints so that they can improve on the product or develop better solutions to problems.

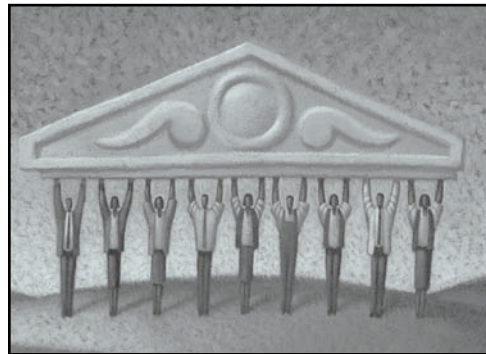
Perspective is a key work attitude. Whereas initiative speaks volumes about your motivation, self-management and ability to get the job done, perspective goes a long way in establishing your repu-

tation for brainpower. Acquire the ability to recognize emerging patterns, to think creatively outside the box, to exercise expert judgment and to identify the changing games with their changing rules and you have acquired the essential

perspective keys to gain entry to the ranks of the star performer.

This next work characteristic, being an exemplary follower, is one of the most challenging for star performers. Not only because it is

difficult to master, but because it is so hard to accept. We have been taught at a young age that being a leader is something to aspire to, and being a follower is something that we settle for. Average performers are always surprised that star producers, whom many people label as leaders, also are adept at following others.



Principles-based regulation ...

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prior to year-end. This attempts to move resources away from the busy annual statement preparation season. Quarterly reporting is another implementation issue yet to be dealt with.


Since the proposed method allows companies to use their own models and incorporate more precise descriptions of product features and their own prudent best estimate assumptions, while providing a general framework, it defines a principles-based structure. An actuary would no longer be able to say that their product does not fit neatly within a previously developed rule. This method also reduces regulatory arbitrage. In theory,

this will align reserves and capital with best practice pricing. This project is evolutionary in nature. There is no going back.

Still time to comment

The December 2003 report from each of the work groups is available on the Academy Web site at http://www.actuary.org/pdf/life/c3_dec03.pdf for capital and at http://www.actuary.org/pdf/life/varwg_1203.pdf for reserves. There are still opportunities to comment on these principle-based concepts. If your company writes these products and you have knowledge of your company's product,

please take the time to determine the implications of these recommendations and, if an important point has been missed, tell someone! Write a comment letter, either pro or con. This is a key time for the actuarial profession and your input is needed.

Max J. Rudolph, FSA, CFA, MAAA, is a vice president and actuary with Mutual of Omaha Insurance Company in Omaha, Nebraska. He can be reached at Max.Rudolph@MutualofOmaha.com. 

“Follower-ship” is the work skill that guides your interactions with others who are your leaders. It focuses on all the relationships you have with people who have organizational power and authority over you. “Follower-ship” is also different from teamwork, which is about co-worker rela-

The degree of one’s success has less to do with the power of the job title, and is related more to the power of expertise, credible reputation, influence and persuasive abilities.

tionships—the horizontal, and not the vertical top-down relationships associated with leadership.

“Follower-ship” means being actively engaged in helping the organization succeed while exercising independent, critical judgment of goals, tasks, potential problems and methods. Star followers have the ability to work cooperatively with a leader to accomplish the organization’s goals, even in the presence of personality and/or workplace differences. Sometimes, you get further along in your career if you are seen as a sharp, dynamic, independent thinking follower who works along with co-workers, rather than someone who competes with them to be the leader.

Team leadership is also a very important work skill associated with star performers. It is practiced among peers, most often in teams. The degree of one’s success has less to do with the power of the job title, and is related more to the power of expertise, credible reputation, influence and persua-

sive abilities. The skills needed here require leaders without egos, and leaders who work quietly and unceremoniously side by side with their co-workers. In this role, they do not need direct supervisory authority. Colleagues voluntarily cooperate with these team leaders because they trust them and believe that if they work together, important things will get done to the betterment of the organization.

Team leadership changes all the time. Star producers realize that being productive team members, as well as team leaders is essential for increased productivity.

Average performers think organizational savvy is the talent for brown nosing and schmoozing in the workplace to help them get noticed by the right people,

which additionally requires obsessive devotion to office politics, another corporate dead end.

Star producers know organizational savvy to be a strategy that enables them to navigate the competing interests within an organization and to promote cooperation, address conflicts and get things done. This often involves expertise in managing individual or group dynamics, knowing when to avoid conflicts and when to meet them head on, and knowing how to make allies out of potential enemies.

These comparisons between the stars and average workers will hopefully give you some insight and strategies to increase your value in your own company. Good luck.

Aimee Kaye is the president of Actuarial Careers, Inc. Her firm is exclusively dedicated to the placement and advancement of chief actuaries, FSAs, ASAs and pre-ASAs. She can be reached by telephone at 914.285.5100 or by e-mail at AimeeKaye@actuarialcareers.com.

Reference: Kelly, Robert E. How To Be A Star At Work. New York: Times Books, 1998. ®

Reprint permission courtesy of The Stepping Stone, the newsletter of the Management & Personal Development Section of the SOA, March 2003 issue. ☺

Long-Term Care Insurance Persistency Experience

Jointly sponsored by the SOA and LIMRA International, the Long-Term Care Insurance (LTCI) Persistency Study examines both voluntary lapse and total termination activity for calendar years 2000 and 2001. Overall, the results indicate that LTCI persistency continues to improve; however, the current improvement has come from the individual lines of business rather than the group lines. For all policy years combined, the overall lapse rate was 4.2 percent for individual plans and 8.9 percent for group plans.

Detailed reports are available both at the SOA’s Web site (www.soa.org) and from LIMRA Online (www.limra.com). For more information about LIMRA’s persistency research program, contact Marianne Purushotham at 860.285.7794 or mpurushotham@limra.com. ☺

Finance

The SOA's Committee on Finance Research has signed a contract with Teresa Winer, chair, Task Force on the Personal Actuary, to identify and review possible existing legislation that restricts actuaries from working in certain areas in which actuarial skills are applicable. The goal of the first phase of the project is to gather relevant legislation and/or regulations that limits actuarial work and with the help of legal consultants to conduct a legal review of up to 10 citations that may be harmful to actuaries. Based on the initial results, a determination will be made as to if a more extensive study is warranted.

For more information on the research, or to learn how you can submit information on legislation and/or regulations, please contact Steve Siegel, SOA research actuary, at 847.706.3578 or ssiegel@soa.org. For additional details, read "You input is needed! Research project to study regulations that restrict actuarial job opportunities," on page 13.

Seeking Research Proposals for "Financial Statement Disclosure Practices of Life Insurance Companies"

Recognizing the inconsistent methods and metrics life insurance companies employ to measure and characterize performance and the diverse type of financial information that is made available to the public, the Financial Reporting Section is sponsoring new research that analyzes the financial statement disclosure practices of life insurance companies. Among the questions to be addressed in the research include:

- What are the financial statement disclosure practices of life insurance companies?
- To what extent is actuarial analysis included in the disclosure practices?
- What metrics are used by life insurance companies and to what

extent are these metrics standardized within the life insurance industry?

- How do life insurers disclose asset-liability management and other risk management initiatives?

For more information about the project and to submit a research proposal for funding consideration, please see the Request for Proposal, "Financial Statement Disclosure Practices of Life Insurance Companies" available on the SOA Web site at <http://www.soa.org/sections/finrep.html>. Proposals must be received by May 17, 2004.

Health Section

Claim Analytics has concluded a case study of how data mining techniques can be used to build a model to predict the likelihood of recovery for group long-term disability insurance claimants. The research, in part, sponsored by the Society of Actuaries Health Section, utilized CART (classification and regression trees), neural networks and genetic algorithms to create a scoring model predicting likelihood of recovery. Practitioners who wish to learn more about data mining techniques and how they may be applied to disability claims management should find this report to be a valuable tool.

The complete report and results of the case study can be found on the SOA Web site at http://www.soa.org/Research/data_mining.html.

If you have any questions or would like more information, please contact Steven Siegel, SOA research actuary at 847.706.3578 or ssiegel@soa.org.

Retirement Systems Experience Studies

The Society of Actuaries' Group Annuity Experience Committee has completed their 1999-2000 Report, which presents the 1999 and 2000 calendar year experience of retired individuals in the United States who are covered under group pension contracts. This report can be

found on the SOA Web site www.soa.org under Research.

If you have any questions, contact Jack Luff, SOA experience studies actuary, at 847.706.3571 or jluff@soa.org.

Ph.D. Grants Competition


The Ph.D. grants program was instituted to encourage graduate students to complete research in topics related to actuarial science and to pursue an academic career in North America upon completion of their degree program. The CAS/SOA Ph.D. Grants Task Force congratulates the following recipients and is pleased to make the second payment on their grant for the 2003–2004 academic year.

Initial grant recipients are:

- Patrice Gaillardetz of the University of Toronto for "Equity-Linked Annuities and Insurances."
- Shuanming Li of Concordia University for "On Experience Rating, Inflation and Interest in Risk Models."
- Bonne-Jeanne MacDonald of Heriot-Watt University for "Risks Inherent in Defined Contribution Pension Plans."

Renewal grant recipients are:

- Alain Desgagne of Université de Montreal for "Location-Scale Parameter Inference with P-Credence."
- Jerome Pansera of the University of Iowa for "Local Risk-Minimizing Hedging Strategies in Life Insurance."
- Min-Ming Wen of the University of Connecticut for "Pricing of Insurance Risks and Estimating the Cost of Insurance Company Equity with the Rubenstein-Leland Model."

Copies of the completed theses can be obtained by contacting the SOA library at 847.706.3575. 


John Culver Woody Scholarships

The Actuarial Foundation, through its AERF Committee, will award up to four \$2,000 (U.S.) Woody Scholarships to undergraduate students who will have senior standing during the 2004-2005 academic year.

Applicants for the John Culver Woody Scholarship are required to have completed at least one actuarial exam, rank in the top

quartile of their class and must be nominated by a professor at their school.

The deadline for applications is Friday, June 25, 2004.

Applications and information are available on The Actuarial Foundation's Web site at www.actuarialfoundation.org. 

We need your ideas ... for papers relating to the application of financial economics to pension actuarial practice

The Joint Academy/Society of Actuaries Task Force on Financial Economics and the Actuarial Model is seeking ideas for research topics that can be developed into papers.

The task force previously sponsored the Vancouver Symposium on the financial economics model in June 2003. The symposium featured 24 papers covering basic research into the application of financial economics to pension actuarial science. In late 2003/early 2004, the task force sponsored a series of webcasts outlining the basic implications of financial economics for pension actuarial practice. The webcasts focused on funding, accounting and investments. The task force is ready to move to the next step in the process, but your input is needed!

Financial economics makes several observations with respect to pension funding, investments, accounting and plan design:

- Full funding on a wind-up basis at all times best serves shareholders and employees when no guaranty entity exists.
- When society establishes a mutual insurance program (e.g., the PBGC) to guaranty promises made by all plan sponsors, full wind-up funding by each plan sponsor is optimal—anything less leads to costly moral hazard.
- Investment in bonds that match wind-up liabilities maximizes shareholder value—risks are reduced, tax gains are induced, managers concentrate on business instead of running pension “mutual funds.”
- Accounting should be based on fair values that do not anticipate returns on risky assets or future non-contractual wage increases. There should be no amortization and deferral.
- Plan designs should serve to enhance the value of the employment relationship for both shareholders and employees.

We've heard from many actuaries and consultants who have found merit in the observations of financial economics with respect to pensions. We've heard from actuaries who've introduced these concepts to clients, but don't know where to go after the initial introduction. We've also heard from actuaries who work with legislatures, regulatory agencies and accounting bodies and who wish to integrate financial economic thinking into their communications with these bodies. Evidently, a great deal more work is needed for pension actuaries to comprehend fully this financial economic perspective and to integrate it into their own thinking.

What research would you like to see us pursue? We've seen many theoretical papers, but few that have applied these principles to historical or stochastically simulated data. What issues would you like to more fully understand? Are there topics that have been addressed, but more explanation is needed? What questions are your clients and others asking about financial economics that you simply cannot answer?

Here's your opportunity to submit an idea for a research paper. Please note that suggesting an idea does not commit you to writing the paper. The task force will collect and review the ideas, with an eye toward building the outline for a spring 2005 symposium.

If you have an idea you'd like us to pursue, please send it to Emily Kessler, SOA staff fellow supporting the research of the task force, at ekessler@soa.org, or call her at 847.706.3530. There is no deadline for submitting ideas—it's an ongoing process. So if you have an idea today, or six months from now, send it to us. We appreciate your help with this very important venture. 