

Risk management

ISSUE 26 ■ DECEMBER 2012

EDITOR'S NOTE

- 3 **Letter from the Editor**
By Pierre Tournier

RISK IDENTIFICATION

- 4 **Rethinking the Ratings-Based Approach**
By Shuyi He

- 6 **Trifurcation: Divide to Conquer Risk**
By David Ingram and Daniel Bar Yaacov

RISK RESPONSE

- 10 **Lump Sum and Risk Transfer: Why Defined Benefit Plan Sponsors Should Consider Risk Transfer as Early as 2012**
By Sean Brennan

RISK CULTURE AND DISCLOSURES

- 14 **Pension Risk Management: The Importance of Oversight**
By Susan Mangiero

- 18 **Thinking a Lot About Risk Lately, Too**
By James Ramenda



Risk management

Issue Number 26 • DECEMBER 2012

Published by the Joint Risk Management Section
Council of Canadian Institute of Actuaries,
Casualty Actuarial Society and Society of
Actuaries.

2013 SECTION LEADERSHIP

Newsletter Editors

Pierre Tournier
e: Pierre.Tournier@allianzlife.com

Officers

Stephen P. Lowe, FCAS, CERA, MAAA,
Chairperson
Vice-Chairperson, TBD
Secretary, TBD
Treasurer, TBD

Council Members

Susan Cleaver, FCAS, MAAA
Eugene Connell, FCAS, ASA, CERA, FCIA, MAAA
Louise Francis, FCAS, MAAA
Barry Franklin, FCAS, ASA, CERA, MAAA
Lloyd Milani, FSA, FCIA, MAAA
Glenn Meyers, FCAS, ASA, CERA, MAAA
Mark J. Scanlon, FSA, CERA, FIA, MAAA
Peter A. Schindler, FSA
David M. Walczak, FSA, MAAA
Stuart F. Wason, FSA, CERA, FCIA, MAAA,
HONFIA
Fei Xie, FSA, FCIA

SOA Staff

Kathryn Baker, Staff Editor
e: kbaker@soa.org

Michael Boot, Staff Partner
e: mboot@soa.org

Susan Martz, Section Specialist
e: smartz@soa.org

Julissa Sweeney, Graphic Designer
e: jsweeney@soa.org

This newsletter is free to section members.
Current issues are available on the SOA website
(www.soa.org).

To join the section, SOA members and non-
members can locate a membership form on the
Joint Risk Management Section Web page at
<http://www.soa.org/jrm>

This publication is provided for informational
and educational purposes only. The Society of
Actuaries makes no endorsement, representation
or guarantee with regard to any content, and
disclaims any liability in connection with the use
or misuse of any information provided herein.
This publication should not be construed as
professional or financial advice. Statements of fact
and opinions expressed herein are those of the
individual authors and are not necessarily those of
the Society of Actuaries.

© 2012 Society of Actuaries. All rights reserved.

JOINT RISK MANAGEMENT SECTION

Canadian Institute of Actuaries
Casualty Actuarial Society
Society of Actuaries

ARTICLES NEEDED FOR RISK MANAGEMENT

Your help and participation is needed and
welcomed. All articles will include a byline to
give you full credit for your effort. If you would
like to submit an article, please contact Pierre
Tournier, editor, at Pierre.Tournier@allianzlife.com.

The next issues of *Risk Management* will be
published:

PUBLICATION DATES

March 2013
August 2013
December 2013

SUBMISSION DEADLINES

December 3, 2012
May 1, 2013
September 2, 2013

PREFERRED FORMAT

In order to efficiently handle articles, please
use the following format when submitting
articles:

- Word document
- Article length 500-2,000 words
- Author photo (quality must be 300 DPI)
- Name, title, company, city, state and email
- One pull quote (sentence/fragment)
for every 500 words
- Times New Roman, 10-point
- Original PowerPoint or Excel files
for complex exhibits

If you must submit articles in another man-
ner, please call Kathryn Baker, 847.706.3501,
at the Society of Actuaries for help.

Please send an electronic copy of the article to:

Pierre Tournier, FSA, CERA

Allianz Life Insurance Co. of North America
e: Pierre.Tournier@allianzlife.com

Letter from the Editor

By Pierre Tournier

IN THE LAST FEW MONTHS we've seen significant loss events driven by model error. Knight Capital Group announced a loss of \$440 million over 45 minutes of trading. The error was traced back to recently installed software. Knight ultimately sold around 70 percent of its equity to survive. At JPMorgan, estimates on hedge losses range from \$2 billion to \$8 billion. While JPMorgan seems big enough to absorb this loss, it suffered public embarrassment and increased regulatory scrutiny.

As these events become more common, model risk will be more important for risk managers. Seeing these highly public events should make us think about our employers' models. Could a model error jeopardize your company? Where do these models sit, and what controls are in place? We can use the awareness of model risk to revisit our own models and push for better management if necessary.

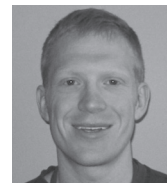
In this quarter's newsletter, we have papers covering a variety of topics. David Ingram and Daniel Bar Yaacov provide a framework to help compare different risk mitigation strategies in "Trifurcation: Divide to Conquer Risk."

Shuyi He discusses the role of credit ratings in "Rethinking the Ratings-Based Approach." This paper discusses how, within specific credit ratings, securities can have widely varying risk profiles, reducing the overall value of ratings themselves.

In "Pension Risk Management: The Importance of Oversight," Dr. Susan Mangiero lays out the risk management process from the trustee perspective. This paper is a good reminder that fiduciary duty to plan participants or policyholders is also a powerful argument for effective risk management policies.

The editorial, "Thinking a Lot About Risk Lately, Too" by James Ramenda discusses the current state of the CERA designation and the role of actuaries in nontraditional risk management positions. It's an interesting perspective on the evolution of actuarial work and puts current trends in a longer-term perspective.

Finally, "Lump Sum and Risk Transfer" by Sean Brenan is an interesting response to current market conditions for pension plans. This paper discusses how active plan design management can help sponsors manage their profiles, reducing the plan's overall risk when the opportunity presents itself. ■



Pierre Tournier, FSA, CERA, is an assistant actuary in the profitability management area at Allianz Life Insurance Co. in Minn. He can be reached at Pierre.Tournier@allianzlife.com.

Rethinking the Ratings-Based Approach

By Shuyi He

ROLE OF CREDIT RATINGS: WHY ARE THEY IMPORTANT AND WHO USES THEM?

Over the past several decades, credit ratings have played an essential role in the financial system and have been used extensively by market participants. Since they are publicly observable and easy to interpret, investors typically use them as a starting point for their investment decisions. Large institutions, such as insurance companies and pension funds, often have internal investment guidelines requiring a specific fraction of capital to be allocated to securities with certain ratings. Financial regulators also rely on ratings. For example, the Investment Company Act of 1940 requires money market funds to hold only highly rated commercial papers. Pension funds also face similar ratings-based investment restrictions. Such regulatory reliance on credit ratings is particularly true for the insurance and banking industry, in which a ratings-based approach is employed to calculate the amount of capital needed to hold in reserves.

COLLAPSE OF STRUCTURED FINANCE RATINGS IN THE CRISIS

Underpinning all these functions listed above is the assumption that credit ratings contain the same amount of information across different categories of fixed-income instruments. However, the collapse of ratings among structured products during the 2007 to 2008 financial crisis casts significant doubts on this assumption. According to Moody's, the number of structured finance tranches downgraded by Moody's skyrocketed nearly eight-fold from 885 in 2006 to 6,801 in 2007.

In relative terms, 2007 saw a spike in downgrade frequency, reaching a record high of 7.2 percent of outstanding tranches, five times higher than its level in 2006. Moreover, one-third of the downgrade actions were against triple-A-rated tranches, which were widely considered to be safe investments by investors. In contrast to the severe credit deterioration in structured securities, the ratings performance of single-name corporate bonds was fairly stable during the crisis. In 2007 and 2008, respectively, 1,411 and 1,322 corporate bonds rated by Moody's were downgraded, slightly less than the number in 2006. Taken together, these results suggest that corporate bonds rating were well-calibrated to the underlying risks in the economy, while the initial credit ratings assigned to structured products were inflated.

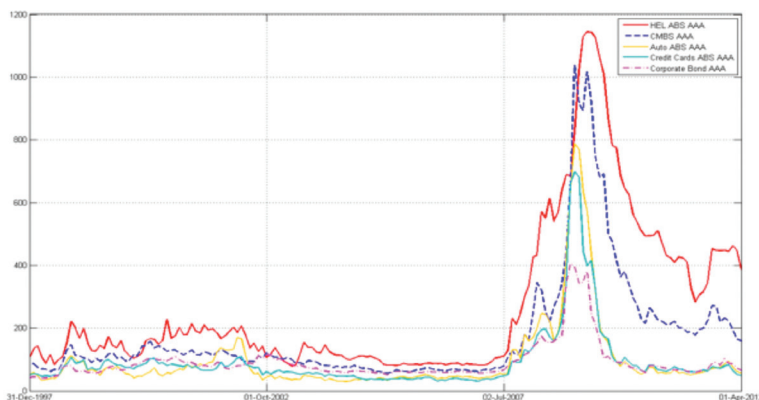
COMPARABILITY OF RATINGS

Such rating inflation among structured securities provides suggestive evidence against the comparability of credit ratings between structured finance securities and single-name corporate bonds. In other words, the same rating scale can mean very different things for structured securities than it does for traditional corporate bonds. A defining feature of structured finance activities is that a large share of securities issued (over 60 percent according to Fitch Ratings) are carved out as triple-A. Therefore, we concentrate our analysis on triple-A-rated securities. Figure 1 plots the evolution of triple-A credit spreads for home-equity loan (HEL), asset-backed securities (ABS), commercial-mortgage-backed securities (CMBS), auto-loan ABS, credit card ABS and corporate bonds. As it displays, all spreads have widened dramatically and reached record highs during the 2007 to 2008 credit crunch. However, the spread spike is more pronounced for structured products than for corporate bonds, suggesting that structured securities are more prone to economic downturns than their ratings-matched, single-name counterparts.

WHAT MAKES STRUCTURED SECURITIES DIFFERENT FROM CORPORATE BONDS?

The core discovery in the recent financial crisis is that securities produced by structured finance are fundamentally distinct investment products from single-name securities. They are actually far riskier than their ratings indicated and have little chance surviving a

FIGURE 1: BASIS POINTS: OPTION-ADJUSTED SPREADS



“ Investors should be aware of the shortcomings associated with credit ratings when employing a ratings-based approach toward pricing complex fixed-income instruments. ”

severe economic downturn. One central insight into the distinction is that the securitization process, which is common to all structured finance activities, substitutes risks that are largely diversifiable with systematic risks. The two-step procedure in the securitization process, pooling and tranching, allows for broad diversification of idiosyncratic default risks in the underlying collateral pool, leaving default risks in senior tranches written against them highly concentrated in the worst economic states. In the spirit of capital asset pricing model (CAPM), security with a risk profile highly exposed to systematic risk is expected to offer investors a higher rate of return than securities with the same expected payoffs but less correlated with the market. Given the way these structured products are manufactured, their payoffs are primarily driven by systematic risks. In contrast, the fortune of corporate bonds is more driven by firm-specific risk tied to a single company.

SYSTEMATIC RISKS

Credit ratings, however, reflect only securities' expected losses in terms of default likelihood and expected recovery value given default, and provide very limited information about their risk characteristics. As a result of their coarseness, securities with a certain credit rating can have dramatically different risk profiles, and thus can command a wide range of spreads as risk premium, depending on their exposure to systematic risks ("beta"). Such information loss in risk characteristics is critical to the understanding of the recent crisis, since many investors in fixed-income markets naively based their investments mainly on credit ratings (expected payoffs). They failed to appreciate the difference between single-name and structured securities when it comes to systematic risk exposures. Such investors in structured products are often less compensated for risks they bear. This is particularly true for investors in senior collateralized debt obligation (CDO) tranches, whose performances are highly correlated with the state of the economy as a whole after repeated pooling and tranching.

The following table summarizes systematic risk exposures of triple-A-rated auto ABS, credit card ABS and corporate bonds, estimated from an in-house model. Not surprisingly, both auto ABS and credit card ABS carry more systematic risks than single-name corporate bonds. It is interesting to note that the triple-A-rated

auto ABS and credit card ABS have been traded at comparable spreads to triple-A corporate bonds in the pre-crisis period, as displayed in Figure 1. This suggests that investors in these structured products are undercompensated for the higher systematic risk they bear.

	Auto ABS	Credit Cards ABS	Corporate Bonds
Systematic risk exposure	57%	47%	34%

CONCLUSION AND NEXT STEP

In the aftermath of the financial crisis of 2007 to 2008, the creditworthiness of credit ratings has been questioned by investors, regulators and the public. Despite their wide use in the financial services industry, they are actually insufficient for pricing and risk management of fixed income securities. We demonstrate that a ratings-based approach often leads to mispricing and underestimation of risks. The Dodd-Frank Wall Street Reform and Consumer Protection Act of 2011 directed federal regulators to remove credit ratings from their rules. In the insurance industry, the National Association of Insurance Commissioners (NAIC) also has taken steps to review its ratings-dependent rules.

Investors should be aware of the shortcomings associated with credit ratings when employing a ratings-based approach toward pricing complex fixed-income instruments. ■



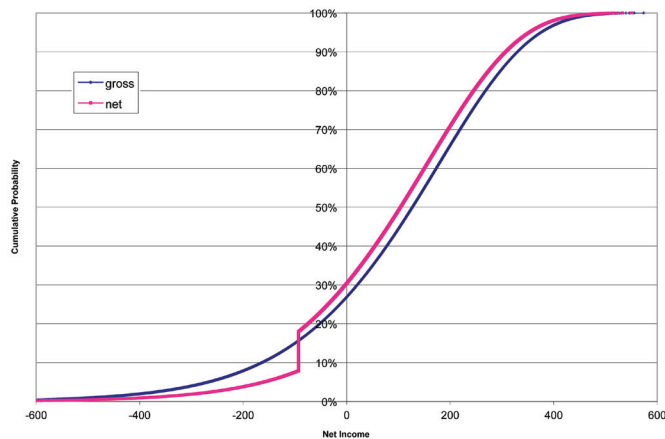
Shuyi He, FSA, CERA, MAAA, is a senior actuary in the AIG/Chartis Capital Modeling Group. He can be reached at Shuyi.He@chartisinsurance.com.

Trifurcation: Divide to Conquer Risk

By David Ingram and Daniel Bar Yaacov

AFTER MUCH TIME SPENT modeling insurer risks, everything starts to look like a logistic curve. But which logistic curve is better? How does one go about deciding whether one risk mitigation alternative is better than another?

Chart 1
UW income net vs gross



Maybe the answers are all there in the logistic curves. But which of the scenarios really matter? Most reasonable risk mitigation strategies provide benefit in some circumstances, but come at a cost that adversely affects results in other scenarios. Cost/benefit analyses may suggest a range of efficient alternatives ... some less expensive, but offering less protection; others that provide more significant protection, but at a greater cost. If such alternatives lie along the same

“efficient frontier,” how can you choose among them?

A research paper by the authors considers the view of multiple stakeholders to answer this question. **Trifurcation** is the name we’ve chosen for the resulting process, which extracts three important numbers that can easily be used to support bottom-line decision making.

DIFFERENT STAKEHOLDERS HAVE DIFFERENT PERSPECTIVES

In the context of strategic decisions, it’s important to identify the various stakeholders—and then separate the benefits and costs of alternative strategies in relation to each stakeholder. Consider reinsurance as a risk mitigation strategy: various reinsurance structures may have costs and benefits that would be perceived differently by stockholders, bondholders, policyholders, management and regulators. This isn’t a new insight—what’s new is our method of quantifying these perspectives.

The main idea is to group outcomes based on how they affect each stakeholder. We use the term **tranches** to describe these different layers of possible outcomes. In the general case, we would identify the values of particular output variables that represent crucial thresholds for each stakeholder, and then derive multiple tranches to reflect the various stakeholders’ viewpoints.

To illustrate, let’s consider a simple case—with a single primary stakeholder whose “critical threshold” value for some specific output variable has been identified. This critical value might represent a life-or-death boundary for the viability of the enterprise. (For example, insurance company management might determine that if the firm’s surplus decreases by more than X percent, they will not be able to continue writing new business.)

THIS LEADS TO A TRIFURCATION OF SCENARIOS

In this simplified case, our analysis yields a division into three tranches: a **trifurcation** of scenario sets for each possible strategy. For each risk mitigation alternative, these tranches can be found by comparing scenarios between the alternate and the current “base strategy”:

- The **Earnings** tranche identifies scenarios where the outcomes before mitigation do not breach the critical threshold. (In the insurer example given above, this tranche corresponds to scenarios where the company’s current strategy results in either a net gain or a loss smaller than the critical X percent of surplus.)
- The **Impact** tranche for each strategy consists of scenarios where this particular risk mitigation strategy provides the desired benefit: outcomes breach

Daniel Bar Yaacov is a senior Vice President at Willis Re in New York. He can be reached at Daniel.bar.yaacov@willis.com.



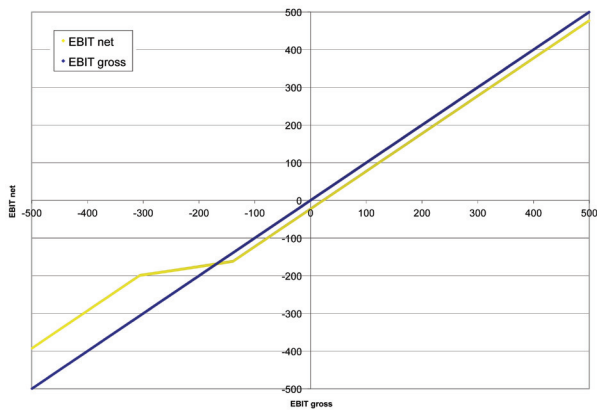
David Ingram is Executive Vice President at Willis Re in New York. He can be reached at david.ingram@willis.com.

the critical threshold before—but not after—mitigation. (For our hypothetical insurer, this means scenarios where the “base strategy” loss exceeds the critical threshold, but the alternative mitigation strategy reduces loss below the threshold.)

- The **Estate** tranche corresponds to scenarios where the mitigation strategy doesn’t provide the needed benefit. In these scenarios, the mitigation strategy (e.g., reinsurance) may still provide a benefit—but not enough to satisfy the stakeholder’s needs.

It may help to view the tranches graphically. One way to do this is to plot the base strategy against the alternative on a scatterplot (in the graphs below, the alternative strategy is an aggregate stop-loss reinsurance cover, while the base case corresponds to no reinsurance):

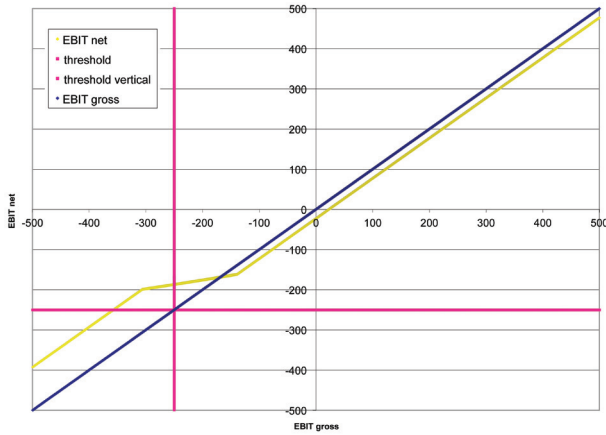
Chart 2
EBIT gross vs net



The dark line shows the “Without Reinsurance” values, which by definition are on the diagonal of this graph because the results without reinsurance do not change. The light line shows the values for the “With Reinsurance” situation, where the results are different with and without reinsurance.

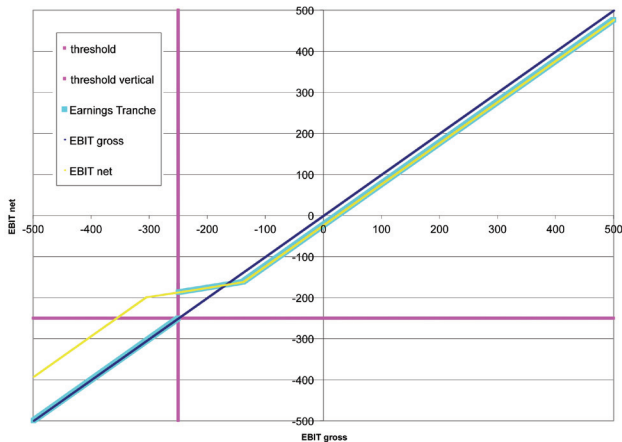
We can then add the critical threshold on each axis:

Chart 3
EBIT gross vs net



Now each tranche can also be plotted. For example, in the plot below the Earnings tranche appears in light blue:

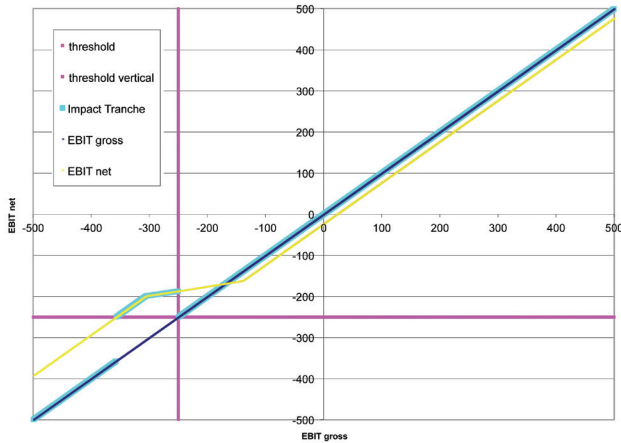
Chart 4
EBIT gross vs net- Earnings Tranche



The Earnings tranche is equal to the scenarios from the “With Reinsurance” example that fall above the threshold. While the Chart 5 on page 8 shows the Impact tranche:

CONTINUED ON **PAGE 8**

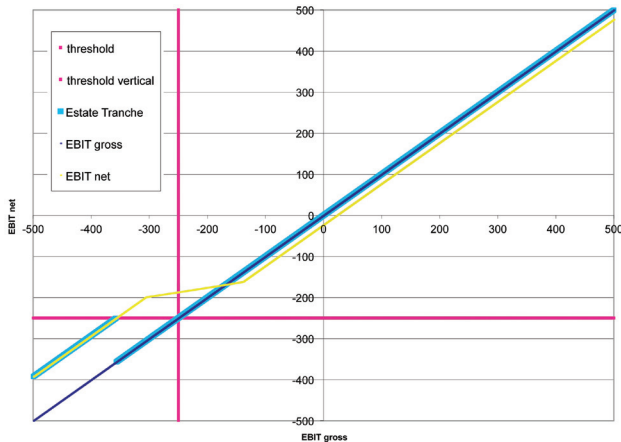
Chart 5
EBIT gross vs net- Impact Tranche



The Impact tranche is equal to the scenarios from the “With Reinsurance” example where the “Without Reinsurance” values are below the threshold, but the “With Reinsurance” values are above the threshold.

And finally the Estate tranche:

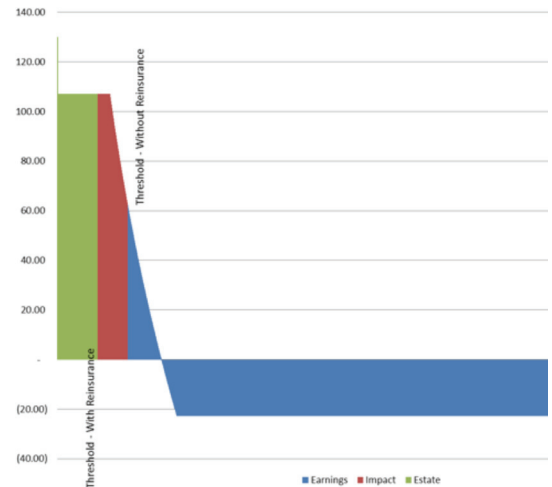
Chart 6
EBIT gross vs net- Estate Tranche



The Estate tranche is equal to the scenarios from the “With Reinsurance” example where the values are below the threshold both “With” and “Without” reinsurance.

Having obtained the trifurcation tranches, we can compare the change in the expected value of scenarios in each tranche separately, as compared to the expected value of the corresponding “base strategy” tranches for each scenario in each tranche.

Chart 7
Trifurcation of Differences



This gives us the ability to look at how the benefits, usually decreases in net losses, compare between the Impact tranche and the Estate tranche.

The graphs on page 9 compare alternative reinsurance structures in terms of “efficiency”—the relative portion of the benefit going to the Impact tranche. A fully or 100 percent effective risk mitigation would be one that has benefits that fall solely within the Impact tranche.

Example 1: Stop loss with 10% Limit ... Proportion of benefit in Impact tranche is maximized when the reinsurance attaches at 88% loss ratio (Chart 8).

Example 2: Stop loss with 20% limit is more expensive, but provides more protection. Because of the higher cost, the highest proportion of benefit to the Impact tranche is seen with an attachment point more likely to provide benefit: in this case, at an 83% loss ratio. (Chart 9).

From the primary stakeholder's point of view, the desirable strategies provide most benefit to the Impact tranche, while strategies that primarily benefit the Estate tranche could be considered inefficient. In the example above, the insurer's top management may be most focused on the Impact tranche; but profit center managers and rating agencies that value stability of results may also see benefit in reinsurance to protect the Earnings tranche. Regulators and policyholders may well desire significant protection for the Estate tranche.

THREE TRANCHES ARE JUST THE BEGINNING...

The Trifurcation approach can be used in many settings, including

- Selecting among reinsurance strategies
- Assessing mitigation alternatives
- Setting risk tolerance levels
- Designing internal reinsurance structures.

Franchise value calculations can be directly tied to the Trifurcation approach to see how different strategies play out in terms of their effect in different tranches. But in some contexts—for example, risk mitigation decisions made by a single division rather by the firm as a whole—franchise value may be a less meaningful metric, whereas the Trifurcation approach still holds.

And of course Trifurcation is just the beginning. In a more complex ERM setting, we can help you consider the crucial thresholds for more than one stakeholder, and then derive multiple tranches to reflect the various stakeholders' viewpoints.

Chart 8
Efficiency of Alternatives

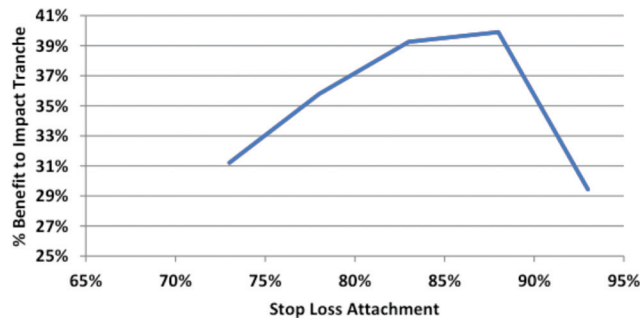
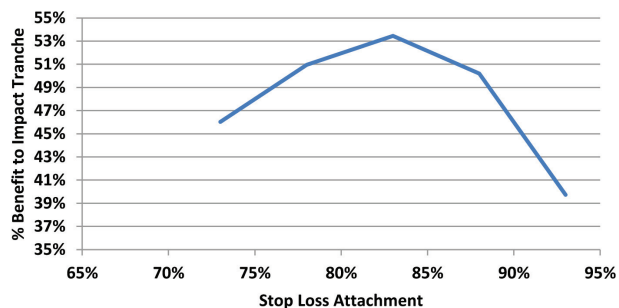


Chart 9
Efficiency of Alternatives



FURTHER READING

Trifurcation: An Approach to Analyzing the Impact of Risk Treatment Alternatives. Daniel Bar Yaacov and David Ingram, 2012. Available at <http://www.erm-symposium.org/2012/research-papers.php> and awarded “Best Paper: Practical Risk Management Applications” at the 2012 ERM Symposium sponsored by the Joint Risk Management Section of the Casualty Actuarial Society, the Society of Actuaries and the Canadian Institute of Actuaries.

Managing the Invisible: Measuring Risk, Managing Capital, Maximizing Value. William Panning, 2006; available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=913682

Sustainability of Earnings: A Framework for Quantitative Modeling of Strategy, Risk, and Value. Neil Bodoff, 2011; available at <http://www.actuarial-foundation.org/programs/actuarial/erm.shtml> ■

Lump Sum and Risk Transfer: Why Defined Benefit Plan Sponsors Should Consider Risk Transfer as Early as 2012

By Sean Brennan

MARKET CONTEXT

The past six months have illustrated that the inflationary pressures have yet to materialize into upward pressure on interest rates. Market turmoil—including uncertainty around the European debt crisis, the lackluster recovery in the U.S. followed by the downgrade of U.S. debt and the increasing duration of the Federal Reserve’s balance sheet—has kept long-maturity interest rates historically

low and suggests that there is no near-term end in sight to the low-rate environment. U.S. pension liability values for funding, accounting and annuity purchase purposes are not directly linked to Treasury rates, but are generally valued based on high investment-grade corporate bond yields.

While Treasury yields declined in the second half of 2011, the overall negative economic outlook had the effect of widening corporate spreads. The end result was an overall decline in corporate rates, although by an amount less than the decline in Treasury yields. The impact for pension plans included pension discount rates that were starkly lower at the end of the year than before the U.S. downgrade, which resulted in further erosion of funded status and increased required cash contributions for 2012 and 2013.

Of course, the decline in Treasury and corporate bond yields drove up bond values as well as pension liabilities. The most commonly used benchmarks for pen-

sion plans experienced returns during the same time ranging from 4% (Barclays Capital Aggregate Bond Benchmark) to as high as 13% (Barclays Capital Long Government/ Credit Bond Benchmark).

U.S. CORPORATE BOND MARKET VIEWS

Historically, the relationship credit yields have maintained with Treasury rates of similar maturity has been relatively consistent outside of highly volatile market downturns and recoveries. If this pattern were to continue, the prevailing view on U.S. Treasury yields would lead us to conclude that credit yields would rise to a similar degree. Recent headlines in the pension industry have reflected the commitments of several sponsors of large pension plans to acquire liability-like bond portfolios. These sponsors have indicated publicly that as their plans’ funded statuses improve, they expect to reduce their investment risk by selling equities and buying bonds.

As a result, we see two primary reasons why a more optimistic outlook for long corporate benchmarks (and hence, a pessimistic outlook for liabilities) may be appropriate than for U.S. Treasury portfolios:

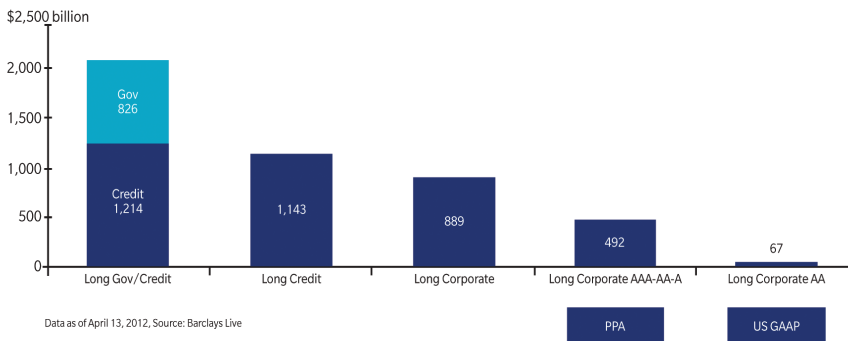
- Credit spreads are currently carrying a higher yield by 140 bps–250 bps than Treasuries, which will help avert declining values due to rising rates.
- Due to the limited issuance of long corporate debt, the trend toward de-risking for DB plan sponsors may offset, partially or completely, the inflationary pressures on corporate yields.



Sean Brennan, ASA, EA, MAAA, is a principal in Mercer’s New York office. He can be reached at Sean.Brennan@mercer.com.

Supply becomes a more acute issue as you target a progressively closer hedge to PPA and US GAAP curves

Market Value (\$ billions)



Supply becomes a more acute issue as you target a progressively closer hedge to PPA and U.S. GAAP curves

To provide some context, defined benefit plan assets for nonpublic plans totaled roughly \$2.2 trillion¹ at year-end 2010. A shift in asset allocation of only 20% of those assets from equity into fixed income would match the total amount available in the Barclays Capital Long Corporate AAA-AA-A benchmark shown at left. The increased demand in corporate bonds will make it harder for some plans and insurers to build their ideal “lowest risk” bond portfolios. That additional risk will be borne by plan sponsors either directly, if they maintain the liabilities on the balance sheet, or indirectly through increased costs for annuity purchases.

“ The ability to look back to more favorable interest rates alone may not compel plan sponsors to pay out lump sums during 2012. ”

WHY LUMP SUMS MAY PROVIDE AN ARBITRAGE OPPORTUNITY

Effective from the beginning of a plan’s 2012 plan year, corporate bond yields have been fully phased in as the basis for minimum participant lump-sum calculations under Section 417(e) of the Internal Revenue Code. For plans that do not currently allow for a lump-sum option to certain participants, many are considering amending their plan to allow TVs to take their benefit immediately as a lump sum. When the plan is amended for this purpose, plan sponsors have some flexibility in the interest-rate basis they elect to use in the calculation of lump-sum amounts at the time they amend the plan to allow for lump sums. As shown in the chart to the right, there are two elements of the lumpsum interest-rate basis plan sponsors can elect.

As mentioned earlier, the sharp decline in corporate bond yields began during August 2011. As a result, plan sponsors electing to use a five-month lookback, that is, relying on the average corporate bond yields during July 2011, will likely use higher interest rates for determining lump sums than were used to determine the accounting liability at year-end accounting disclosure. The result would see plan sponsors settling liabilities through lump-sum cashouts at amounts less than what was held on the balance sheet at year-end for these same participants, and that is also less than the economic value of the liability at today’s rates.

The ability to look back to more favorable interest rates alone may not compel plan sponsors to pay out lump sums during 2012. If a plan sponsor expects corporate bond yields to rise to a yield higher than those during July 2011, then it may be prudent to opt to do nothing. This is where the investment considerations should not be ignored. The potential arbitrage opportunity depends on which assets are liquidated in order to pay lump sums.

The typical plan sponsor holds approximately 30%–40% fixed income, and that portion of the portfolio should have had positive returns since July 2011, although it may have underperformed the mark-to-market plan liabilities. Paying lump sums out of fixed income assets now would essentially negate the liability returns during the reference period, while capitalizing the fixed income returns before rising yields could

Lookback Period		Stability Period			
Plan sponsors can choose to “look back” to discount rates up to 5 months prior to the beginning of the stability period. Once set, elections can be changed but lump sums are subject to a “better of” formula for 1 year following any change.		The stability period determines the frequency of updating lump-sum interest rates; plan sponsors can choose among monthly, quarterly and annual stability periods. Once set, elections can be changed but lump sums are subject to a “better of” formula for 1 year following any change.			
Q3	Q4	Q1	Q2	Q3	Q4

erode those losses. This is the equivalent of “selling high and buying lower.” A reasonable reaction to this approach may be to ask, “If we sell fixed income to de-risk, how is there any risk reduction?” In many cases, this will actually still result in reduced risk for plan sponsors, in addition to being a savvy investment move. Liquidating fixed income assets to pay lump sums could result in as much as a 3%–15%² reduction in the funded status volatility (measured in dollars), depending on the characteristics of the fixed income assets used. Additionally, plan sponsors will save on Pension Benefit Guaranty Corporation premiums, administrative expenses and potentially other costs.

OTHER CONSIDERATIONS

Thus far, we have only discussed investment-related reasons, but there are other reasons for plan sponsors to act immediately. The Society of Actuaries recently developed and proposed a new mortality table to be used as the standard table for U.S. actuarial valuations, which assume longer expected lifetimes for both males and females. If adopted as anticipated by the IRS, the enhanced tables could add 2%–4% to TV liabilities as early as 2014. This would increase lump-sum costs for this population or result in increased contribution requirements if lump sums are not offered, thus providing more incentive to plan sponsors to consider a cashout ahead of the change in standards.

CONCLUSION

The decision on if and when sponsors should pay lump sums, and out of what assets, involves many considerations in this discussion but which are important to

CONTINUED ON PAGE 12

take into account. These considerations include participant security, plan administration, data quality, legal issues and overall logistics of executing the lump-sum offering. The appropriateness of an investment- and risk-management strategy in the plan, both before and after lump sums are paid, requires detailed analysis and will vary by plan sponsor. However, for plan sponsors looking to reduce risk, we feel that the factors outlined above suggest that sponsors may benefit from considering risk-transfer opportunities much sooner than they may have anticipated.

About the Author

Sean Brennan is a Principal in Mercer's New York office and is a member of Mercer's Financial Strategy Group. He is responsible for strategic asset allocation/risk budgeting, asset/liability modeling, funding, accounting policy, and risk transfer diagnostics for domestic and multinational corporate clients seeking integrated financial risk management advice for their pension plans.

Recently, Sean has worked with large plans to implement dynamic de-risking strategies, including detailed

analyses of the following components: identifying and planning for target funding and risk appetite, building an investment glide path based on funded status and/or interest rate triggers while incorporating liability settlements, and selection of custom liability fixed income managers. In addition, his responsibilities include monitoring investment performance, funded status monitoring/attribution, risk budgeting monitoring for defined benefit plans and portfolio structure.

Sean holds a BA in mathematics and political science from Emory University. He is an Associate of the Society of Actuaries and an Enrolled Actuary under ERISA. He holds the Chartered Financial Analyst (CFA) designation and is a member of the CFA Institute and the New York Society of Security Analysts. ■

© 2012 Mercer LLC. All rights reserved. Reprinted with permission.

END NOTES

- ¹ Mercer estimate from publicly available information.
- ² Results above are based on Mercer's Capital Market Outlook, January 2012.



Where Cutting Edge Theory Meets State of the Art Practice

More than 400 executives, directors, and risk management experts gathered at the 2012 Enterprise Risk Management (ERM) Symposium in Washington, DC, to present the latest on ERM thinking and practices. Make sure you don't miss the next opportunity—our 2013 ERM Symposium—to learn from industry leaders about this emerging discipline and expand your ERM skills.

Highlights include:

- Top risk management experts offering their perspective on key risk issues
- Pre-Symposium seminars on ERM topics
- Networking opportunities to renew and expand your list of ERM contacts
- Exhibitors demonstrating their ERM services and knowledge
- Call for papers program showcasing new research

Visit www.ermssymposium.org to learn more about this global conference.



*The 11th Annual Premier
Global Event on ERM!*

2013 ERM Symposium
April 22-24, 2013
Swissotel Chicago
Chicago, IL



Presented by the Casualty Actuarial Society, Canadian Institute of Actuaries, Professional Risk Managers' International Association and Society of Actuaries



Colegio Nacional de Actuarios, A.C.

and with collaboration of the Asociación Mexicana de Actuarios, Colegio Nacional de Actuarios, and Enterprise Risk Management International Institute.

Pension Risk Management: The Importance of Oversight

By Susan Mangiero

PENSION OVERSIGHT HAS ALWAYS BEEN IMPORTANT, but perhaps never more so than today. More than a few public and private retirement programs are in financial trouble, the regulatory environment is rapidly changing, “breach of duty” lawsuits are on the rise and market volatility is a constant.¹

The consequences of incomplete or poor oversight are far from trivial. According to the U.S. Department of Labor, there are “approximately 730,000 private sector pension and 401(k) plans, covering 102 million individuals” subject to the fiduciary provisions of the Employee Retirement Income Security Act (“ERISA”).² In addition, there are millions of government employees and other participants who are in plans not covered by ERISA, but who

are nevertheless dependent on proper governance of their retirement monies.

Surprisingly, while there is a lot written about general investment fiduciary duties as they relate to retirement plans, there is relatively little information about pension risk control. While that is slowly changing, it is important to understand attitudes about risk management in the pension community.

RISK MANAGEMENT ATTITUDES

The term “risk management” means different things to different people. A traditional interpretation, often used, refers to the use of insurance products to protect fiduciaries against litigation-related liability. Others define risk management as the use of derivative instruments to transform cash flows or minimize market risk. A more comprehensive use of the term refers to the management of multiple risk types—such as financial, operational and legal risks—and assumes some use of derivatives. (This broader definition underlies the discussion that follows.)

Complexity—perceived or otherwise—is another factor. A fiduciary person who is uncomfortable with investment concepts is unlikely to ask tough questions about derivatives, performance metrics or risk control strategies. As a result, consultants and other advisors

may feel it is not necessary to spend time discussing the topic with pension clients.³ Moreover, there is a widely held belief that the delegation of duties to external money managers completely takes care of any further responsibilities on the part of fiduciary persons. In fact, pension plan sponsors still maintain risk monitoring responsibilities in cases where delegation is permitted.^{4,5}

Finally, there is the issue of motivation. Unless and until fiduciaries recognize the need to fully incorporate risk management as part of the investment process, it will be difficult—perhaps impossible—to get those in charge to spend the requisite time and money to identify, measure and manage risk. Plan trustees need to assess their comfort level with the status quo by asking questions such as: What risk factors currently affect portfolio value and returns? How is risk mitigated, if at all? And is the risk management strategy uniform across investment strategies and outside money managers?

Whether litigation worries, regulation or interest in implementing best practices will take fiduciaries to the next step is unclear. What is certain is that fiduciaries play a vital role in the financial health, good or bad, of a pension plan. How they carry out their duties is a question of increasing interest to beneficiaries, regulators, shareholders and taxpayers. Having a clear, logical and well-documented risk management process in place can make a big difference. This is especially true if the risk policy comports with prevailing law, reflects relevant economic characteristics of a plan, promotes discipline in the form of adequate checks and balances and offers an opportunity to improve the risk-adjusted financial performance of plan assets on behalf of beneficiaries.

GETTING STARTED

A cornerstone of the pension risk management process is a commitment on the part of senior decision-makers to make resources available. This is easier said than done. Changes to municipal plans, and the related operating budgets, frequently require approval by busy legislators who are under increasing pressure to keep taxes low. Terms and conditions of multi-employer plans are often the result of long, and sometimes difficult, labor negotiations. These plans are rarely, if ever, open to quick change.



Susan Mangiero is a managing director in the FTI Consulting Forensic and Litigation Consulting practice and is based in New York. She can be reached at susan.mangiero@fticonsulting.com.

“Paying people to take excessive risks, in anticipation of higher returns, can be fatal for a pension plan that is obligated by law to make good on its promises.”

Nevertheless, a top-level commitment to prioritize risk management and make it an integral part of the investment process is essential to success. Why? In addition to authorizing money to buy or upgrade systems, people have to be hired to make and to carry out appropriate policies and procedures. Beyond that, a commitment to risk management affects how and why people are compensated.

Paying people to take excessive risks, in anticipation of higher returns, can be fatal for a pension plan that is obligated by law to make good on its promises. The flip side is to have a structure in place that rewards people for prudent decision-making. That doesn't necessarily translate into avoiding riskier investments. It just means that promotions, bonuses and raises should be tied to allocating assets, selecting securities (if not outsourced) and making risk control decisions that satisfy the goals set forth in the pension plan's investment policy statement.⁶

Of course, establishing a risk management process doesn't happen all at once. Making a commitment to managing risk, and implementing an appropriate reward system, is just the beginning. As shown in Exhibit 1 (right), training, systems, internal controls and effective communication are other essential elements of the risk management process.

It is also worthwhile to note the fact that the activities required to set up and to implement a risk management process are rarely executed in sequence—and can be done concurrently. So it's important to ensure that you have the necessary education, personnel, strategy and systems in place before making any important decisions. For example, buying or improving a computer system makes no sense in the absence of adequate training; authorizing limits will do little good without an adequate system in place to track violations; and failure to communicate results will make it hard to support a budget to pay qualified personnel.

COMPREHENSION AND COMPUTERS

The human resources dimension is another vital part of the risk management process. That includes hiring and training qualified people, not just in trading and analysis but also in operations. The costs of making support staff more fully aware of proper procedure

*Exhibit 1:

The “Five C” Approach to Risk ManagementSM

VARIABLE	OBJECTIVE
<i>Commitment</i>	<ul style="list-style-type: none"> ■ Ensure that adequate resources are made available to support risk management activities. ■ Promote an organization-wide risk management culture that results in appropriate compensation and operational policies and procedures.
<i>Comprehension</i>	<ul style="list-style-type: none"> ■ Ensure that all relevant staff members sufficiently understand risk management basics, including the interdependence among departments, to avoid unnecessary losses. ■ Promote risk management best practices.
<i>Controls</i>	<ul style="list-style-type: none"> ■ Mitigate the adverse effects of rogue trading. ■ Stem losses before they get too large.
<i>Computers</i>	<ul style="list-style-type: none"> ■ Review risk-adjusted performance and possibly revise strategies. ■ Identify trading limit violations. ■ Improve fund governance.
<i>Communication</i>	<ul style="list-style-type: none"> ■ Ensure budgetary approval for risk management resources. ■ Instill confidence in beneficiaries and regulators that the plan is well managed.

** This is not an exhaustive list of process components.*

for processing and settling trades is tiny compared to the benefits of minimizing loss. This is especially true when reputation is taken into account, since the monetary damage associated with a single transgression seldom incorporates the lingering effect of bad publicity. A plan sponsor may lose business or incur additional costs in the form of a special audit or regulatory investigation in response to news about back-room problems, model mistakes or poor oversight. Moreover, pension trustees could be found personally liable and incur separate costs to defend themselves.

Providing tiered training to reflect differences in education and experience is also a fine idea. But regardless of seniority and function, employers need to keep one thing in mind when hiring risk management profession-

CONTINUED ON PAGE 16

Pension Risk Management ... | from Page 15

als: though quantitative skills are paramount, a facility with numbers is not enough. There is no substitute for understanding what makes markets tick and using common sense to know when something seems wrong. Additionally, the ability to anticipate adverse consequences—and investigate further, when necessary—is a hallmark of a savvy risk manager.⁷

In addition, the importance of having a good technology system in place cannot be emphasized enough. Even when a pension fund uses outside firms, trustees are unable to do their job effectively without being able to properly collect data, corroborate external numbers and monitor performance vis-à-vis already established investment goals.

Budgetary constraints, type of assets under management, number of delegate firms and existing infrastructure are just a few of the factors that will determine whether to lease, buy or internally develop a user-friendly system. Similar considerations determine the requisite functions and, by extension, the cost of a system. The ultimate shopping list will vary by the type and the size of a pension plan, as well as by how much an organization can spend and by the ability of staff to understand how to use the system.

Whatever your decision, it is wise to allow for time and money to test the system. Find out what resources are available to train staff. Ask about what money managers use the system and inquire about the underlying algorithms used to measure risk. It would be a shame to spend a lot of money on a system that is hard to use, difficult to modify and incompatible with the performance reports sent by various money management firms.

CONTROLS AND COMMUNICATION

Buying a sophisticated computer system and spending money to train staff is a waste of money unless good controls are in place. Time and time again, losses can be traced back to weak (or nonexistent) checks and balances. Internal and external controls should work together to provide an early warning that something is awry.

If a problem is not picked up at the outset, ideally there should be a mechanism in place to ensure that someone, at some point, is alerted and can take corrective action. Trustees should document internal controls and make them widely available throughout the organization. In addition, pension professionals need to ask auditors and outside money managers about how often their controls are updated and about the process they go through when a violation occurs. As stated earlier, times are changing. Pension fiduciaries are being asked to explain mishaps and neither ignorance nor benign neglect offers a legitimate excuse.

Fiduciaries have two choices. They can adopt a comprehensive risk management policy because they have to or they can choose to do so voluntarily, recognizing the benefits of being proactive and prudent. Either outcome involves communication. In the first case, foul play, once made public, generates ill will and can invite litigation or regulatory inspection. In the second case, pension leaders can let others know that their money is in good hands. Some pension sponsors provide performance numbers. Others add information about investment strategies and/or risk management initiatives. The key is to shed light on the process, not just the results, and to do so in an understandable manner.⁸

THE ROAD AHEAD

As Confucius once said, “A journey of a thousand miles begins with a single step.” If a plan has no risk management process in place, now is the time to move forward.



“No one is exempt from doing the right thing on behalf of existing and soon-to-be retirees.”

For those organizations with an established process, a review and possible revision are in order. Regardless of where fund trustees currently stand with respect to risk control, detailed documentation and justification are crucial.

What was the reasoning behind a particular part of the risk management process? How was the decision made to use derivatives or to forgo their use in lieu of an alternative approach?⁹ What is the current compensation arrangement by job function and objectives and does it reward speculation? Who has the authority to change trading limits? How are money managers hired and fired as a function of their reported risk-adjusted returns? What risk metrics are deemed appropriate and why? Process means little without comprehensive documentation that spells out answers to these and many other pertinent questions.

No one is exempt from doing the right thing on behalf of existing and soon-to-be retirees. This is true regardless of plan type.¹⁰ Even honest and well-intended players stand to lose, since fiduciary breach elsewhere has the potential to accelerate an already fast-moving trend toward increased regulation. If that occurs, plan sponsors will lose the flexibility to make important decisions on their own and will incur higher compliance costs, making it that much harder to generate cash flow and to satisfy plan obligations.

Waiting is no longer a viable option!

Susan Mangiero is a managing director in the FTI Consulting Forensic and Litigation Consulting practice and is based in New York. She provides compliance, dispute and litigation support to asset managers, institution investors and their counsel. Dr. Mangiero is a CFA charterholder, a certified Financial Risk Manager and an Accredited Investment Fiduciary Analyst. She can be reached at susan.mangiero@fticonsulting.com.

This article was originally published in the March/April 2005 issue of GARP Risk Review magazine. Reprinted with permission. ■

END NOTES

- ¹ According to the Administrative Office of the US Courts, new ERISA cases filed rose from 9,167 cases in 2000 to 11,499 cases in 2004.
- ² See the February 17, 2004, press release entitled “Labor Department Issues Guidance on Fiduciary Duties in Response to Mutual Fund Abuses.”
- ³ In June 2004, the US Department of Labor launched an education program called, “Getting It Right — Know Your Fiduciary Responsibilities,” to assist plan sponsors and other fiduciaries in discharging their duties.
- ⁴ Plan sponsors need to seek the advice of a legal professional about relevant delegation rules, including the way assignment should take place, who can be a delegated fiduciary and when delegation can occur.
- ⁵ Thomas Z. Reicher. “Pension Alert: Selecting Asset Managers,” *Journal of Financial Planning*, April 1993.
- ⁶ It makes no sense to invest without first establishing a clear, comprehensive and appropriate policy statement. It provides the roadmap to guide trustees for every aspect of the investment and related risk management processes.
- ⁷ For more information, see Susan M. Mangiero’s “Life in Financial Risk Management: Shrinking Violets Need Not Apply,” *AFP Exchange*, July/August 2003. Contact the author for a copy of the article.
- ⁸ Obtaining information about pension plan performance and investment/risk strategies is far from uniform. Plan type, and related regulation, determines reporting frequency and scope. Moreover, in some cases, it is downright difficult to get timely and detailed data. For a detailed discussion about pension fund reporting, see chapter four of *Risk Management for Pensions, Endowments, and Foundations*, by Susan M. Mangiero.
- ⁹ For further information about the role of derivatives in discharging fiduciary duties, see George Crawford’s “A Fiduciary Duty to Use Derivatives” (*Stanford Journal of Law, Business & Finance*, 1995) and Randall H. Borkus’s “A Trust Fiduciary’s Duty to Implement Capital Preservation Strategies Using Financial Derivatives Techniques” (*Real Property, Probate and Trust Journal*, 2001).
- ¹⁰ Plan type determines the exact obligations of fiduciary persons.

Thinking A Lot About Risk Lately, Too

By James Ramenda

This article was originally published in the August /September 2012 issue of The Actuary.

SOA PRESIDENT BRAD SMITH made some thought-provoking comments in a recent Letter from the President (*The Actuary*, February/March 2012 “The Nature of Risk”). In particular, as a result of his “thinking a lot about risk lately” he pointed out some potentially uncomfortable realities concerning hoped-for avenues of growth for the actuarial profession:

- A sample of very large insurance companies’ CROs shows that only about one-third were credentialed actuaries.
- To date, the CERA designation is still working toward one of its original purposes: to broaden the designation’s appeal to a meaningful number of non-actuarial professionals.
- Research indicates barriers to entry for actuaries in pursuing enterprise risk management (ERM) in nontraditional areas, including a perception that our education is not relevant to non-insurance related industries.



James Ramenda, FSA, CERA, is senior vice president, Enterprise Risk, SS&C Technologies, Inc. He can be reached at jramenda@sscinc.com.

Among the conclusions was that these facts suggest a re-examination of an idea that has enjoyed some prominence in the past decade, i.e., that actuaries can penetrate non-insurance-related ERM (the example

given being ERM for a hypothetical candy bar manufacturer—I use airlines when discussing this possibility, myself). A corollary conclusion was that growth may be more readily achieved by increasing focus on the markets we currently serve.

I’ve spent about 30 years in nontraditional work, including my current job designing and marketing risk management systems for hedge funds, so I’ve been thinking a lot about risk lately, too. Now, one might expect a “nontraditional actuary” to take issue with the foregoing conclusions. However, my experience suggests that President Smith’s points are not only well-founded, but if anything, they could be expanded to include some of the broader challenges facing our members and our brand.

More specifically, I think the prospects in new and/or non-traditional areas are in some ways a reflection of trends in the traditional insurance and pension areas and therefore must be addressed together. I believe that even well before the financial crisis, many of our members’ traditional employers had reached a very mature stage as a result of the maturing demographics of their end-customers. Top-line growth flattened out in many lines of business. Where there was high growth it was sometimes accompanied by large losses, such as occurred in early long-term care products and certain forms of variable annuities.

It’s logical that as end-customer-driven demand for our traditional employers slows, so too, does these employers’ demand for actuarial services. The good news is that the actuarial profession is not suffering the full effects of this slow-down in end-customer demand because there is currently a boom in “process-driven growth,” i.e., new opportunities arising from regulatory, governance and financial reporting processes.

While there is no substitute for strong end-customer demand, process-driven demand does have its attractions. Just consider what process-driven demand has done for the accounting profession in the form of Sarbanes-Oxley. CPAs are now an integral part of the corporate governance process. Any process that absolutely requires a professional’s signature can be very good for that profession, at least in the short term.

But process-driven demand has disadvantages as well:

- Because it brings costs and complexity to businesses, it rewards scale and consolidation, rather than development of new products and markets.
- With consolidation large companies grow larger, but fewer in number, with a net reduction in higher-level jobs industry-wide.
- Smaller entrepreneurial companies are disproportionately burdened, reducing opportunities for some of our most creative members.
- Some may view the nature of process-driven work as less intrinsically rewarding than market-driven work.

“... we must not only re-evaluate the path to growth in new areas, but also examine the growth trend in traditional areas.”

Also, while it is tempting to think of the ratcheting-up of regulatory and reporting complexity as the very embodiment of the mythical “Actuaries’ Full-Employment Act,” the ultimate outcome can be far different. Actuaries of my vintage can remember the ERISA boom that was to guarantee the careers of anyone working with private sector defined-benefit plans. In retrospect, ERISA actually foreshadowed the peak of employer willingness to offer private sector defined-benefit plans. Likewise, perhaps, there may currently be big opportunities at the outset of U.S. health care reform, but in the long term it is easy to imagine scenarios (e.g., single payer) that would greatly decrease the demand for health insurance actuaries. And while all the solvency and accounting changes on the way may create voluminous initial work for some, they may also cost others their jobs permanently by reducing the returns available to their employers.

I see a connection between demand in the traditional industry environment and President Smith’s concerns over the prospects for actuaries in new areas like broader risk management. My experience is that at least some CERAs, as well as many nontraditional actuaries, in general, have pursued those directions not because they wish to avoid traditional actuarial work, but rather because the market for such work has changed in the ways indicated above.

So I think we must not only re-evaluate the path to growth in new areas, but also examine the growth trend in traditional areas. Too often it seems to me that we have defined our growth in terms of supply, e.g., number of new fellows or exam-takers, and not by the demand for our services. In this column I’ve speculated on the trends in demand, both the level and the nature of the demand, but this is simply my own conjecture. I think we need to get a better understanding of the future demand side of the equation in both new and traditional areas in order to determine how best to protect and build our brand for our current members, as well as being realistic regarding the standards for students and helping them understand the prospects they can expect. The financial crisis punctuated an era of significant change in the business models and fortunes of many of our profession’s traditional employers. It also accel-



erated the rise of ERM and spawned new areas of process-driven demand for actuarial services, even as it further pressured end-consumer driven demand. As I agree with President Smith’s call for a re-examination of our potential new avenues for growth, I see the issues involved in this effort and the issues facing traditional areas as two sides of the same coin, both looking vastly different than most would have thought 10 years ago, both facing challenges worth a closer look. ■

JOINT RISK MANAGEMENT SECTION

Canadian Institute of Actuaries
Casualty Actuarial Society
Society of Actuaries

NONPROFIT
ORGANIZATION
U.S. POSTAGE
PAID
SAINT JOSEPH, MI
PERMIT NO. 263

475 N. Martingale Road, Suite 600
Schaumburg, Illinois 60173
p: 847.706.3500 f: 847.706.3599
w: www.soa.org

Risk management

