



## The Coming Movement in Life Insurance Securitization

by Ed Betteto

This article has focused on motivation and trends rather than mechanics. Those interested in details are welcomed to contact the author.

The role of capital markets in the life insurance industry has been much discussed over the past few years. Insurance securitization efforts have to-date been primarily directed at catastrophe risk attracted by the margins of this low frequency/high severity business, particularly in the upper layers. An additional motivation for this attention was a perceived lack of capital to deal with a large catastrophe, with the attendant price increase that historically followed such an event.

Attention has now turned to insurance business characterized by large pools of small relatively homogenous

(continued on page 2, column 1)

## Enterprise Risk And Capital Management

by Joan Lamm-Tennant, Ph.D.

Editor's Note: This article is reprinted with permission of General & Cologne Re "from Risk Insights" and General Re New England Asset Management.

Efficient employment of capital throughout the insurance enterprise is a dilemma that most managers consider complex, yet critical to success. Capital efficiency suggests that operational and financial opportunities collectively result in maximum expected return, subject to the enterprise's risk tolerance. ERCM is an analytical framework for determining the efficient employment of capital across the enterprise while maintaining an appropriate balance between the insurer's risk appetite and its desire to earn attractive returns for its policyholders, shareholders or club members. ERCM is built upon a foundational premise that each component of capital is related and must be considered in the context of an overall portfolio of the insurer's capital management initiatives. That is, operational and financial opportunities in essence become a "portfolio" of choices whereby the effectiveness of any one choice is dependent upon the alternative choices. For example, appropriate asset allocation is dependent upon the business mix, leverage position, dividend policy and reinsurance strategy. Likewise, the appropriate reinsurance strategy is related not only to the business mix but also to the asset allocation choice, leverage position, and dividend policy.

When allocating capital to achieve optimal financial/operational results, managers must identify the metric for evaluating success: accounting or economic. For example, some companies monitor success in terms of GAAP return on equity or growth in GAAP surplus, while other insurers consider economic measures such as shareholder-

(continued on page 5, column 1)

## LOMA Collaborates on New Reinsurance Designation

by Edward T. Burns & Jennifer W. Herrod

As reinsurance has become critical in managing the bottom line, insurance companies need educational tools to help them better understand reinsurance processes and procedures. LOMA, in conjunction with LOMA's Reinsurance Administration Professionals Committee (RAPC), has developed a unique program to fill that need.

Not only do many hands make light work, many industry specialists also enhance LOMA's ability to create high-quality materials for professional education and development. Recent collaboration between LOMA and a newly formed industry committee has functioned well to guide the development of two unique products designed to offer the whole industry a better understanding of the inner workings of reinsurance-insurance that transfers risk from one insurer to another.

The first of these products is a new StepOne text entitled *Intro to Reinsurance*, which is designed to introduce the basic concepts of reinsurance. The second product, *Reinsurance Administration*, is a full-length textbook to be used as the basis for the cornerstone course in a new associate-level program leading to the professional designation, Associate, Reinsurance Administration (ARA). Students can earn the ARA by completing six LOMA courses (see page 15). e concerns, problems, and solutions.

## The Growth of an Industry Initiative

The new reinsurance education products became possible through a concerted industry effort begun years ago by the ives representing many prominent rein-

(continued on page 13, column 1)

### In This Issue

	Page
Enterprise Risk and Capital Management by Joan Lamm-Tennant.....	1
The Coming Movement in Life Insurance Securitization by Ed Betteto.....	1
LOMA Collaborates on New Reinsurance Designation by Edward T. Burns, Jr. & Jennifer W. Herrod.....	1

## The Coming Movement in Life Insurance Securitization *continued from page 1*

risks such as life insurance. The driving force for an entry of the capital markets into the life insurance industry are somewhat different than those motivating securitization in the catastrophe market. There is no lack of capital in the industry, although some regulators may take issue with this statement. The logic behind the trend toward life insurance securitization lies in price efficiency. Given the right conditions, the capital markets can hold insurance risk more efficiently than an insurance company.

To maintain its ratings and attract customers and intermediaries an insurance company is compelled to hold certain levels of capital on its balance sheet, including the level of conservatism required by regulators in their liabilities. These capital requirements make it very difficult to earn competitive rates of return on capital for many core products.

Historically there has been less pressure on returns for the powerful mutual companies than existed for stock companies, with the argument that much of a mutual company's profit is

distributed in its policyholder dividends.

Recently mutual companies have been incented to measure themselves according to standards that can more easily be understood by the outside world. Among other factors, their boards are paying more attention to performance and rating agencies have been including earnings standards in their rating reviews.

In this environment having too much capital can be a problem rather than an advantage. Many view the demutualization movement as necessary for mutual companies to gain access to more capital to fuel acquisitions. For the survivors in the end game of the consolidation currently underway, this will indeed be the case. However demutualization will also provide a means to distribute excess capital to shareholders. Just as in other industries, shareholders will demand a return of capital that is not deployed efficiently.

Similar forces have led to alternative solutions displacing traditional products in other areas:

- Mutual funds vs. bank deposits
- Debt instruments vs. bank loans
- Self insurance vs. traditional health or commercial insurance
- Asset backed securities vs. financial institution balance sheets

### Conditions for Success

Thus far, life insurance securitization has been intellectually appealing but in practice there have been barriers that have prevented transactions from being completed.

Probably the most challenging hurdle is the creation of an industry standard for claim assumptions. The industry tables compiled by the actuarial profession are dated; historically a benchmark table that is 10 years old in an industry where underwriting standards varied only modestly with time would suffice. However there has been rapid recent development of underwriting techniques that have allowed the nimble to cherry pick risks, leaving the less nimble with a below average profit margin as insurance brokers and agents selectively place each customer with that insurance company most competitive in particular risk classes.

There is more variation in underwriting standards by company than has existed before, making claim forecasting more difficult. While the examination of historical claims experience for a particular underwriter remains a valuable tool, it takes time to assess the results of new underwriting standards even at large writers, due to low claim expectations for newly underwritten lives. Even if early select experience is credible, there remains the decision as to how much the superior selection of risk is worth as people age and as more years pass from the date of selection.

An additional issue exists in that important underwriting information is often not captured in electronic form, making mortality forecasting more difficult for existing business. If emerging experience for a particular book of business could be supported by demographic information, a bidder for the business

### REINSURANCE SECTION NEWS

Issue 45

March 1999

Published by the Reinsurance Section of  
the Society of Actuaries  
475 N. Martingale Road, Suite 800  
Schaumburg, IL 60173-2226

Phone: 847-706-3500 Fax: 847-706-3599  
World Wide Web: <http://www.soa.org>

This newsletter is free to Section members. A subscription is \$15.00 for nonmembers. Current-year issues are available from the Communications Department. Back issues of Section newsletters have been placed in the Society library. Photocopies of back issues may be requested for a nominal fee.

**Bernard Goebel**, ASA, *Reinsurance Section News* Editor  
**William R. Wellnitz**, FSA, Chairperson  
**Graham J. Bancroft**, FSA, Vice-Chair  
**Jeffrey N. Altman**, FSA, Secretary/Treasurer

**Cecilia Green**, CAE, Director of Intergrated Communications  
**Joseph B. Adduci**, DTP Coordinator

Facts and opinions contained in these pages are the responsibility of the persons who express them and should not be attributed to their employers, the Reinsurance Section, its Committees, of the Society of Actuaries. Errors in fact, if brought to our attention, will be promptly corrected.

Copyright © 1999 Society of Actuaries. All rights reserved.  
Printed in the United States of America.

could be more aggressive than would be the case without such information. There is increasing evidence of the powerful effect of certain demographic characteristics on mortality rates.

Despite these challenges, conditions are right for the development of standards that can be trusted by non-practitioners. The significant recent improvement in mortality, supported by industry studies, population mortality studies, social security mortality, medical research and by insurers own mortality studies, has provided reinsurers with the motivation to increase the rate at which they forecast mortality improvement in the bid for more business.

The challenges are not dissimilar to those posed in the early days of securitization in the mortgage market. Twenty years ago the prepayment rate of long-term mortgages by zip code was proprietary information; today this information is contained in published indices. As happened with prepayment modeling in the mortgage market, the electronic revolution will facilitate the development of more accurate forecasting of cash flows in life insurance blocks of business.

Several months ago the *National Underwriter* published an article entitled "The Coming Changes in Life Insurance Risk Management." One of the themes

---

***"If emerging experience for a particular book of business could be supported by demographic information, a bidder for the business could be more aggressive than would be the case without such information."***

---

of this article is the rapid conversion of medical records from paper to digital format in the health care industry and the use of such information in the underwriting of insurance applications. While the article was about a revolution in life insurance underwriting, the existence of demographic, medical and other underwriting information in electronic form will also facilitate a dramatic change in

how life insurance cash flows will be valued. Privacy advocates will be concerned about an insurer passing such information on to another party. Processes to ensure that no names pass hands will likely mollify them.

A second condition for success is an efficient platform to transform insurance risk into capital market instruments. An early barrier to U.S. transactions has been acceptable accounting treatments for the insurance companies. Early transactions in the catastrophe market have used Special Purpose Vehicles to conduct the transformation. In the life insurance business, the transforming entity is more likely to be a legitimate reinsurance company, albeit domiciled offshore to provide the flexibility to conduct the transformation.

A third condition for success is for the transformation to be conducted by a brand name with a track record in securitization. Investors will want comfort to participate in a new asset class; the knowledge that the transformer has a stake in being accurate with the cash flows will be important. Investors will also want to know that the business has been modeled according to standards developed in the formation of other asset classes such as mortgage securitization.

The last and perhaps most important

ingredient is high ratings for the instrument—the rating agency "seal of approval." Dependable cash flows will be critical in obtaining such ratings.

Lehman Brothers has been a pioneer in the formation of other new asset classes, notably mortgage securitization. In preparation for the coming market in insurance securitization, the firm has dedicated 500 Million USD in capital to

Lehman Re Ltd., a new reinsurer domiciled in Bermuda. Lehman Re is licensed for both property and casualty reinsurance, as well as life and annuity reinsurance. The team that has been formed to support this initiative is comprised of professionals from both the capital markets and the insurance markets. The cross-training that began several months ago is an important step in providing customers with seamless transactions rather than the sometimes awkward handoffs than can exist between different industries.

### **The Early Days**

As was the case with the creation of other asset classes, the trend towards life insurance securitization will be an evolution rather than a revolution. Observers in the industry know that mortality risk has been shifting in large volumes from insurers to reinsurers over the past few years. If reinsurers are right in their mortality forecasts and are taking advantage of their R&D focused on mortality projection, then one can view this movement as one step in the evolution of insurance risk away from the insurance company platform. Most large reinsurers possess platforms that give them some, but not all, of the advantages afforded by securitization.

Early transactions will likely focus on books of closed business with established histories of mortality and lapse rates because the supporting documentation will help build confidence in the projected cash flows. These books will also be judged by the transformers to have characteristics that strongly suggest favorable future mortality. While investors will likely only accept projections based on sound data, the transformer will attach a further value to the upside associated with the possibility that mortality may be lower than that forecasted in the securitization cash flows. This upside could be sold to institutions who want to make a leveraged play on mortality. In addition to the long secular improvement in mortality, there is the possibility of any of a number of significant medical breakthroughs that

*(continued on page 4, column 1)*

## The Coming Movement In Life Insurance Securitization *continued from page 3*

are exciting the medical community and will make big winners of anyone "long" on mortality. When insurance companies write life insurance policies, their profit is of course affected by how actual claim rates compare to projected claim rates. The upside has historically been owned by the entity holding the downside risk. In a securitization, the downside is going to be carved into pieces with some of it held by investors in a corridor above expected ( the junior tranche), some by another group of investors in a corridor above this ( the senior tranche ) with the balance being held in the "catastrophe layer" that covers the possibility that claim rates may be high enough to eliminate the principle of both the senior and junior bonds. When the cash flows have been separated in this manner, the possibility of profit stemming from actual claim rates being below forecast can be sold separately.

Lehman will use its proven abilities to tranche cash flows to direct risk to those entities most comfortable with the risk/reward profile for each tranche. This approach has created pricing efficiency in several other industries. One of the more interesting financial instruments could provide, for a lump sum consideration, the difference, if positive, of expected claims less actual claims. Entities who want to place a bet on a breakthrough of much longer lifespans will be attracted to this "upside instrument."

### The End Game

If an asset class for life insurance risk is successfully developed, what of the roles for insurers and reinsurers?

Insurance companies have already been reshaping their business as evidenced by the active merger and acquisition activity and as documented in

Reinsurers will be natural partners for those interested in participating in the evolution. Some may be highly interested in particular cash flows created by a

---

***" The challenge of being world class in a series of core competencies in order to successfully compete in all their existing businesses is likely to be met by only a few outstanding companies."***

---

numerous articles over the past few years. The challenge of being world class in a series of core competencies in order to successfully compete in all their existing businesses is likely to be met by only a few outstanding companies.

Many see their ultimate roles as one or two of 1) managing customers, 2) sourcing business, 3) administration, 4) product development/manufacturing. In the first two categories, entities such as the large retail brokerage houses that control tens of millions of customers must be seen as ultimate competitors, in which case, some areas of focus should be shed to concentrate management attention. In the last two categories there will be room for only a few large players and the niche companies. Here again, concentration on core competencies is of the essence.

There will always be room for reinsurers who are astute in forecasting mortality. I am sure that some of them are confident that transformers will not beat them at their own game. In any case the capital markets will not be suitable for some of the risk present in insurance portfolios especially in the early days.

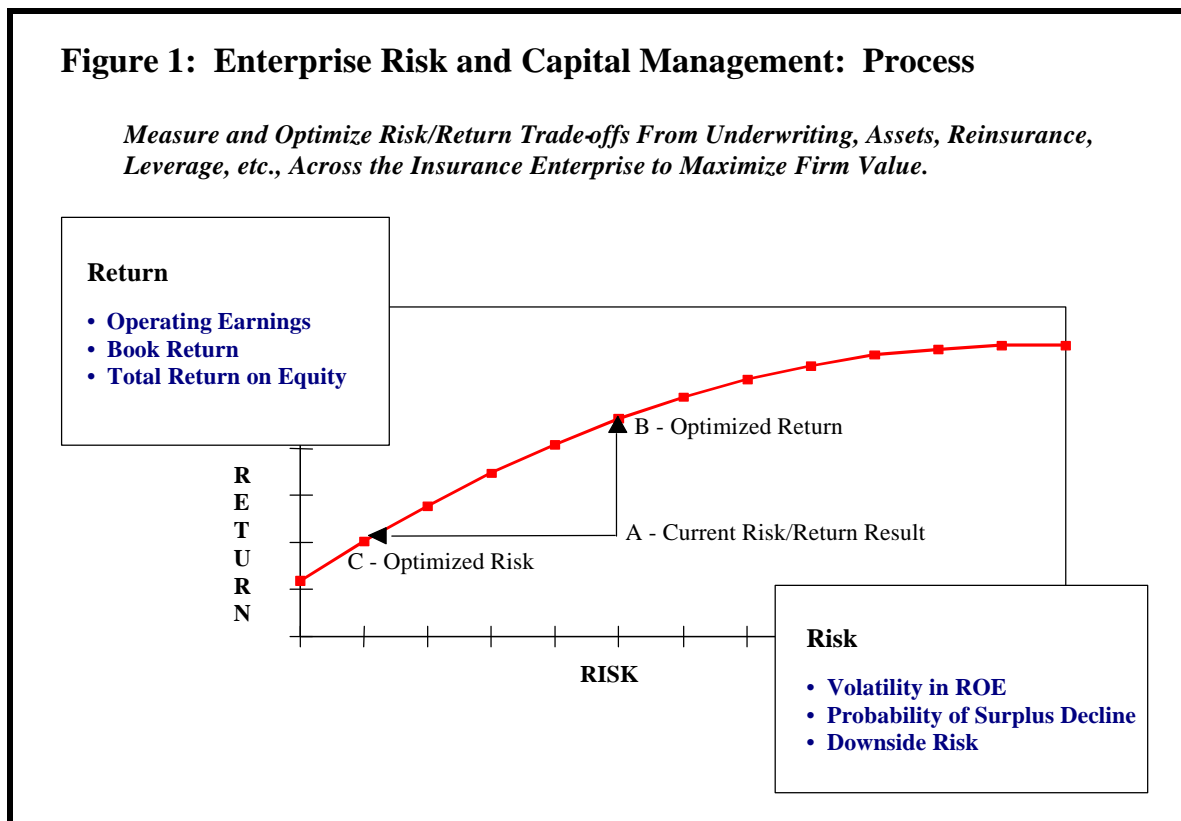
transformer like Lehman Re because of the leveraged plays on mortality available. By shedding the capital associated with the corridor of risk absorbed by the investors, reinsurers could significantly increase their return on capital.

### Conclusion

The early days of the life securitization market are going to be challenging and exciting. The path to success is anything but a six-lane highway. It's more like a rock-filled winding narrow path down a steep mountain aboard a stubborn mule. I wouldn't want to be doing anything else.

*Ed Betteto is a Senior Vice President at Lehman Re Ltd., a wholly owned subsidiary of Lehman Brothers Inc. He can be contacted: (441) 296-8451 or via email: ebetteto@lehman.com.*

**Enterprise Risk And Capital Management**  
*continued from page 1*



wealth or total rate of return. An analytical framework supporting the efficient employment of capital must be mindful of these alternative success measures and must customize the objective function when optimizing decisions to recognize the appropriate success metric. Furthermore, since decisionmakers are encumbered by regulation, rating agencies and taxation, ERCM allows for the recognition of operational and financial constraints. This ensures that the recommended decision is capable of being transacted.

**Why Manage Risk at the Enterprise Level?**

By managing risk at the enterprise level, one may take full advantage of all internal diversification opportunities. The firm achieves greater efficiencies by optimizing the total organization, as opposed to optimizing the parts. Likewise, firm value is increased through enterprise risk management for

three reasons: (1) firms can avoid costly investment decision errors such as the classic problem of underinvesting or passing up opportunities with positive net present values; (2) firms can decrease taxes; and (3) firms decrease costs associated with encountering financial distress and monitoring the conflicts between agents (shareholders, rating agencies, security analysts, policyholders, and employees).

**Enterprise Risk and Capital Management—Process**

Optimization routines not only manage financial risk but also allow for maximization of the firm's success drivers and ultimately its value within the constraints of risk tolerance and other internal/external limitations. One way of illustrating this concept is to refer to the efficient frontier as depicted in Figure 1. Although the concept may be familiar, it is not to be confused with the asset-only efficient frontier. We recognize the com-

plete enterprise and, therefore, have considered the risks associated with both sides of the balance sheet. Point A benchmarks the firm's current operational/financial decision set (product mix, asset allocation, reinsurance choice, leverage policy, dividend policy) in a risk/return paradigm. By optimizing the various operational/financial decisions while recognizing the interrelationships, efficient decision sets (illustrated as points B and C) are identified. At point B, the firm's expected measure of success is improved without increasing risk. Alternatively, at point C, enterprise risk is reduced without effecting the success measure.

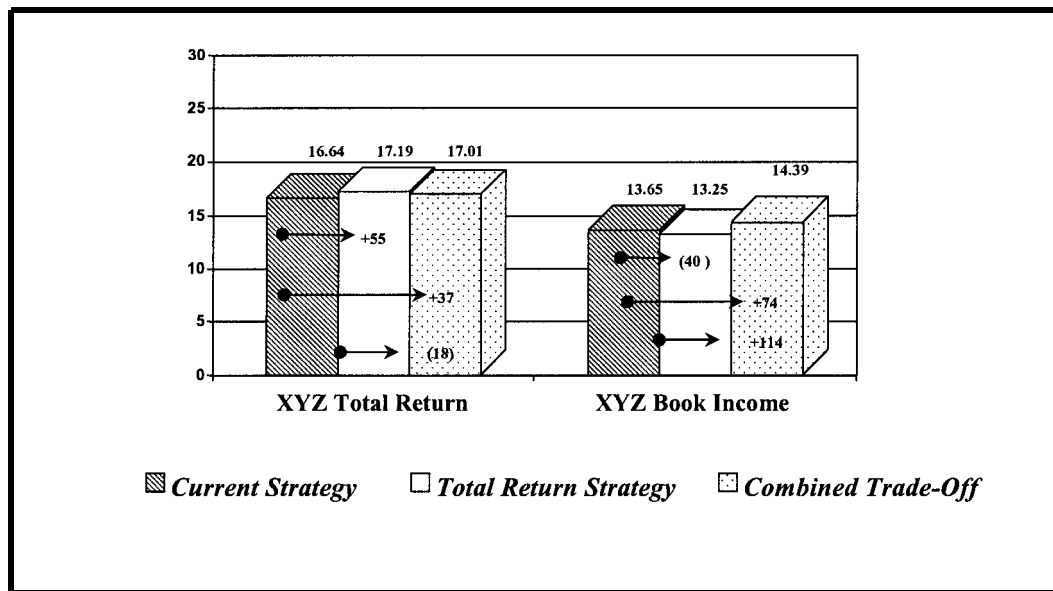
The efficient sets, underlying Points B and C, are reflective of a business process that maximizes the impact of operational and financial decisions on the enterprise's success drivers, while constraining for risk as well as other internal/external constraints. Financial economic theory becomes the foundation

*(continued on page 6, column 1)*

## Enterprise Risk And Capital Management

*continued from page 5*

**Figure 2: Managing the Divergence: Total Return vs. Book Income**



for these optimization routines, while systems and technology become the engine, allowing management to gain insights from detailed and interrelated company data.

Evaluating the effectiveness of a capital management strategy in a risk/return framework is complicated since decisionmakers tend to manage towards numerous success drivers. In addition, risk has numerous metrics. Using alternative measures of success as the objective function (aftertax total return on equity, book income, growth in premiums) and alternative measures of risk (volatility, downside risk, value at risk), managers can more fully appreciate the various risk and return profiles relative to their business. Furthermore, managers gain insights into the various conflicts such as managing towards economic value versus GAAP or statutory value. These conflicts exist because we have numerous agents in our business (rating agencies, regulatory authorities, tax, security analysts, shareholders), each with differing perceptions of return and

risk. Ultimately, decisionmakers manage the divergence between the various conflicts in their business. Identifying the conflicts, and the resulting costs attributed to these conflicts, supports the ultimate resolution.

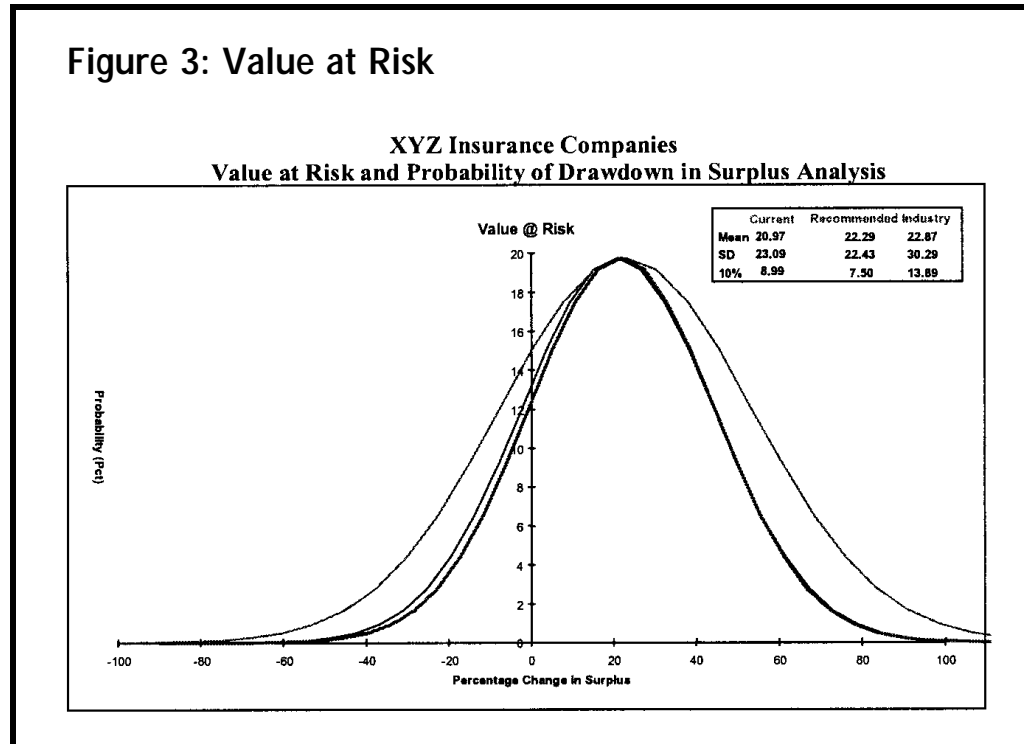
Figure 2 illustrates the tradeoffs between ERCM routines targeting optimal economic value versus optimal accounting value. Given the insurer's current set of capital decisions (business mix, asset allocation, reinsurance and leverage), the insurer's expected economic total return is 16.64% with a GAAP return on equity (book income) of 13.65%. Capital allocation choices are structured to optimize economic total return while achieving a target of 17.19% (an increase of 55 basis points relative to the current target). Nevertheless, this capital allocation choice reduces GAAP return on equity (book income) by 40 basis points. If the decisionmaker considers book income and total return as equivalent units, this would be an acceptable position. Given the attention placed on book income by

regulators, rating analysts and security analysts, a decision-maker most likely values a unit of book income more than a unit of total return. Consequently, a combined objective function targeting economic total return with a constraint on book income growth may be preferred. The capital allocation choice resulting from the combined objective function increases economic total return relative to the current strategy (although it is suboptimal relative to the total return strategy). Nevertheless the capital allocation strategy, resulting from the combined objective function, drives book income to 14.39% (an increase relative to the current decision set of 74 basis points).

Two methodologies may be employed in deriving optimal operational/financial decision sets: MeanVariance Method and Stochastic Financial Statement Method.

The MeanVariance Method employs some simplifying assumptions. One of these assumptions suggests that the distribution of asset returns and losses can

Figure 3: Value at Risk



be captured with reasonable accuracy using the mean and variance. Although this assumption can be overly restrictive, the MeanVariance Method is conceptually eloquent allowing for ease in interrelating numerous confounding variables.

When attention to accuracy is paramount, as opposed to conceptual simplicity, the Stochastic Financial Statement Method is more appropriate. The advantage of Stochastic Financial Statement Method is its ability to capture the true underlying distributions of the assets, liabilities and its ability to model assets and liabilities at detailed levels.

### Business Decisions Supported by Enterprise Risk and Capital Management

ERCM provides analytical support to the following operational and financial decisions:

1. What is the insurer's overall enterprise risk exposure measured in terms of "value at risk" or "probability of surplus decline?" How does this level of enterprise risk compare to peer companies?
2. What is the appropriate risk level and underlying optimal asset

allocation policy relative to liabilities?

3. Given that capital is limited, which insurance markets should be targeted for growth while recognizing the economic interrelationships between the lines of business mix? How should capital be allocated across lines of business?
4. Which reinsurance structure(s) is appropriate from an economic perspective versus an accounting perspective?
5. When considering merger/acquisitions, what is the economic value of the target company relative to the acquirer's portfolio of assets and liabilities?
6. Which constraints (internal and external) affect the employment of capital and what are the economic costs of these constraints?

### Value at Risk

ERCM derives a value at risk in terms of a probability of surplus decline. The distribution of potential percentage changes in surplus is derived using the Stochastic Financial Statement Method. Although alternative percentages can be derived, for the purpose of this example, value at risk is measured as the probability of a

10% surplus decline. Using a nonlinear stochastic process, the distribution of each liability and each asset is modeled capturing the expected return, variance and covariances. For each path a financial statement is derived, resulting in a change in surplus from the beginning balance sheet. This distribution of percentage change in surplus across paths becomes a measure of downside risk: the fear of loss, as opposed to the fear of uncertainty.

Figure 3 illustrates the distribution of a percentage change in surplus for the XYZ Insurance Company given its current set of operational/financial decisions, versus an optimal (recommended) set of operational/financial decisions. In addition, the industry parameters are model for comparative purposes. To derive the probability of a 10% decline or more in surplus, the area under the distribution curve and to the left of 10%, is calculated. The current operational/financial decisions result in an 8.99% chance of a 10% surplus decline. The recommended decision set reduces the value at risk to a 7.50% chance of a 10% surplus decline. For benchmarking purposes, the current and recommended decision set results in a value at risk

(continued on page 8, column 1)

**Enterprise Risk And Capital Management**  
*continued from page 7*

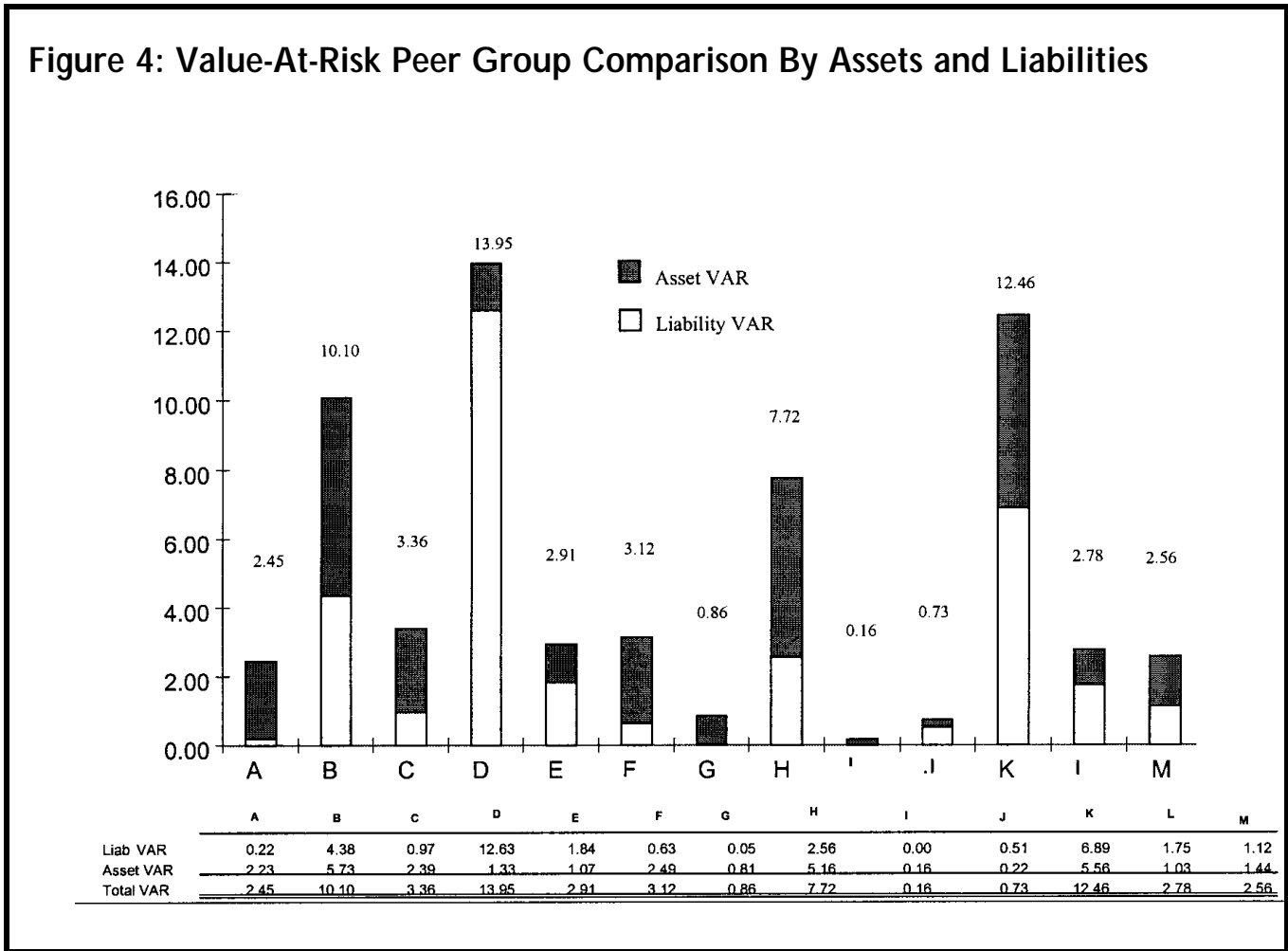


Figure 4 illustrates the value at risk (probability of a 10% or more declines in surplus) for Company A relative to individual companies specified as peer companies. Company A has a moderate value at risk relative to its peers. Furthermore, Company A's value at risk is largely driven by the risk embedded in assets as opposed to underwriting. The reverse is true for Company D.

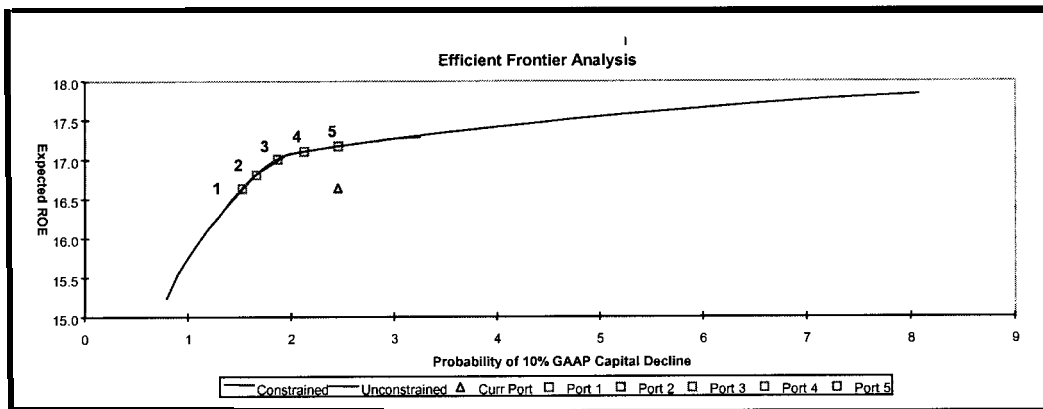
**Appropriate Level of Risk**

The prior example benchmarked the risk level but was not explicit in terms of the appropriateness of the level. One approach to delineating an appropriated level of risk is to derive the point of diminishing marginal returns. That is, the level of risk whereby incremental increases in risk result in additional expected return although at a diminish-

ing rate. At some point it becomes senseless to continue traveling up the efficient frontier. In fact, eventually the efficient frontier flattens so that incremental increases in risk taking behavior results in no additional expected return. Referencing Figure 5, reward for risk taking begins to diminish beyond Portfolio 2.



Figure 5: How Much Risk Should We Take?



	Current Portfolio	Portfolio 1	Portfolio 2	Portfolio 3	Portfolio 4	Portfolio 5
Expected Return	16.64	16.64	16.81	17.01	17.10	17.17
Std Dev of Exp Rtn	13.54	12.32	12.60	12.98	13.36	13.81
Probability of 10% Decline	2.46	1.53	1.67	1.87	2.13	2.46
Book Income	13.65	14.56	14.48	14.39	14.27	14.02
Addl Return			0.17	0.20	0.09	0.07
Addl Risk			0.14	0.20	0.26	0.33
Addl Return/Addl Risk			1.21	1.00	0.35	0.21

less than the industry. An alternative benchmark population could be companies of similar A.M. Best's ratings or companies with similar characteristics (size, line of business structure, ownership structure.)

**Capital Allocation**

Given that capital is limited, operating entities and ultimately the lines within the operating entities should be capitalized on a risk adjusted basis. That is, a line of business should be capitalized based upon the risk it adds to the enterprise, as opposed to its "stand alone" risk. Considering the expected return and risk characteristics of each line of business independently of the other lines

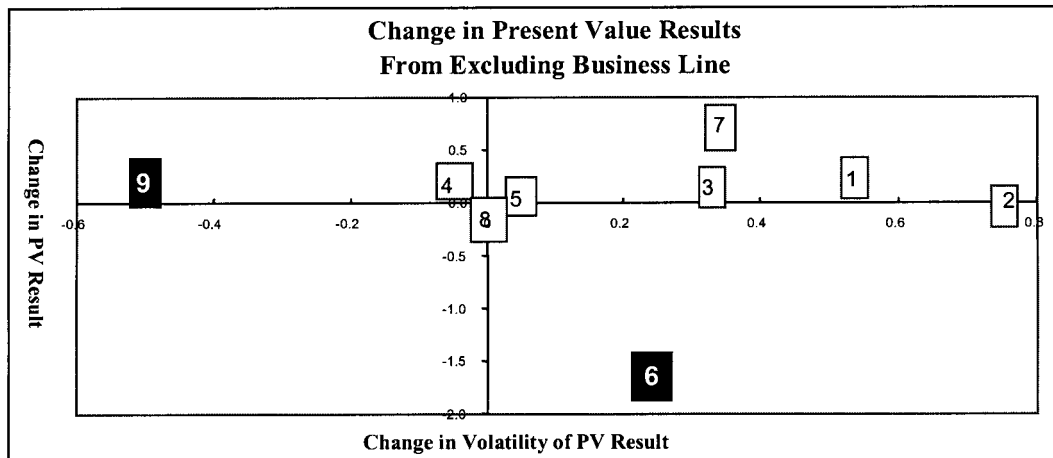
may be problematic. The riskiness of the line (and ultimately the basis for allocating capital on a risk adjusted basis) must be respecified as the risk the line carries into the portfolio of other lines of business given the alternative financial decisions such as leverage and asset allocation. Allocation of capital on a risk adjusted basis (whereby risk is specified as the "nondiversifiable" component of total risk) is contingent upon modeling enterprise risk, as well as enterprise return.

Likewise, when targeting lines for growth, the decisionmaker must consider the "relative" attractiveness of the line on an enterprise risk adjusted basis. Figure 6 illustrates the effect on the present value

of cash flows (inclusive of assets and liabilities) and on the volatility of the present value of cash flows across stochastic paths, when a line is excluded from the portfolio. For example, if line 9 is excluded from the firm's portfolio of assets and liabilities, the present value of profits is increased by 0.22 and the volatility in the present value of cash flows is decreased by 0.54. Hence line 9 would be targeted for sale or perhaps runoff. Alternatively, if line 9 is critical to allow entrance into line 6, then line 9 may be reinsured. Line 6 is quite attractive; elimination of line 6 from the portfolio would not only decrease the present value of cash flows but would also increase volatility.

**Enterprise Risk And Capital Management**  
*continued from page 9*

**Figure 6: Allocating Capital by Line of Business**



	Mean PV Result	Std Dev of PV	Change in Mean PV Result	Change in Std Dev of PV
All Lines	6.80	4.13		
1 Line 1			0.25	0.50
2 Line 2			-0.02	0.72
3 Line 3			0.16	0.30
4 Line 4			0.19	-0.09
5 Line 5			0.06	0.01
6 Line 6			-1.63	0.18
7 Line 7			0.74	0.30
8 Line 8			-0.13	-0.03
9 Line 9			0.22	-0.54

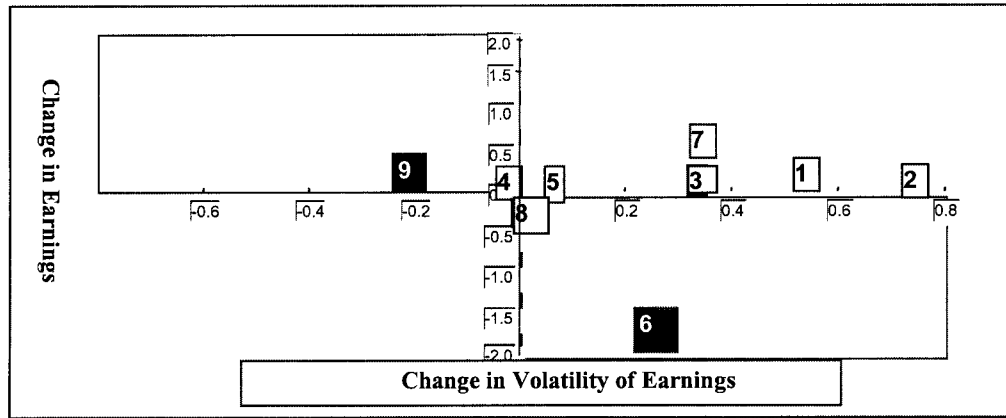
**Reinsurance Analysis**

An appropriate reinsurance structure follows from the previous analysis. For example, assume that line 9 is reinsured, the enterprise's present value of cash flows will decline as well as enterprise risk. Referencing Figure 7, economic enterprise value declines 7 units, whereas enterprise risk declines 14 units due to reinsuring line 9. Having reinsured line 9 might be well justified since the decrease

in enterprise cash flow volatility (even though this decrease may be less than that of the line) releases units of enterprise risk. These units of enterprise risk released through the reinsurance decision may be subsequently spent in the asset markets by reallocating assets to allow for additional units of interest rate risk, reinvestment rate risk or credit risk. If the reward to risk taking behavior in the asset markets is greater than the cost for laying off risk in the liability markets via

reinsurance, then the reinsurance choice is economically intuitive. In essence, the decisionmaker swaps risk units across the balance sheet so as to optimize the portfolio of risk units. The decision is indifferent where the risk units originate so long as the resulting portfolio yields maximum expected return net transaction costs. Reinsurance releases risk exposures on the liability side of the balance sheet. Similarly, an asset hedge strategy will release risk exposures on the asset

Figure 7: Integrating Reinsurance



	Mean Earnings	Std Dev of Earnings	Change in Excluding Earnings	Change in Std Dev of Earnings
No Reinsurance	6.80	4.13		
With Reinsurance	6.73	3.99		
	-0.07	-0.14		
			1 Line 1	0.25
			2 Line 2	-0.02
			3 Line 3	0.16
			4 Line 4	0.19
			5 Line 5	0.06
			6 Line 6	-1.63
			7 Line 7	0.74
			8 Line 8	-0.13
			9 Line 9	0.31

side of the balance sheet.

**Merger and Acquisition Analysis**

The economic value of an acquisition or merger may not be determined unless the interrelationships between the targeted and acquiring firms are explicitly recog-

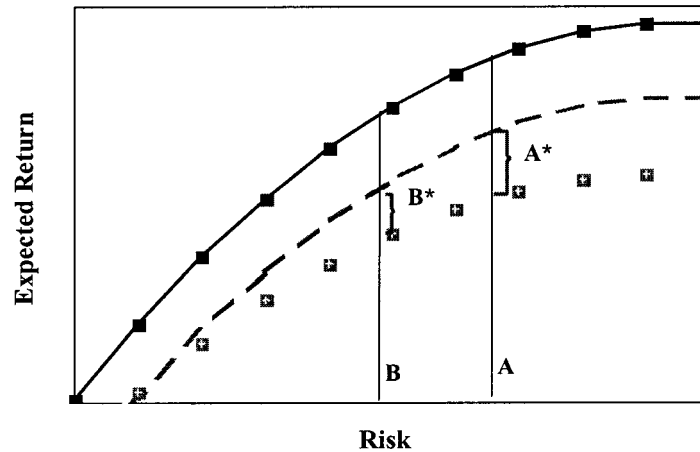
nized. Furthermore, the economic value of the acquisition or merger is dependent upon the risk propensity post acquisition. Figure 8 illustrates the enterprise efficient frontier for the acquiring firm and the targeted firm, as well as for the combined firm's efficient frontier. Note that

the economic value of the acquisition is dependent upon the post-acquisition risk tolerance. If the risk tolerance is A, then the economic value and ultimately the efficient price for the acquisition is A\*. Likewise, the efficient price is B\* if the risk tolerance is B.

## Enterprise Risk And Capital Management

*continued from page 11*

**Figure 8: Merger and Acquisition Analysis**



### Cost of Constraints

As constraints are imposed (external or internal), the new constrained efficient frontier lies inside of the unconstrained efficient frontier. Hence, the opportunity cost of the constraint becomes observable. For any level of risk tolerance some expected return will be foregone. The

may be evaluated. Some constraints appear important, yet are not binding. These constraints have little or no effect on the ultimate decision set, yet they may impose an opportunity cost.

### Summary and Conclusion

Managers of insurance companies are entrusted with capital, however, with the

laying off risk. ERCM provides a framework, supported by analytics, to assist managers when rendering optimal operational/financial decisions. These decisions may be optimized as a portfolio of choices.

*Joan Lamm-Tennant wishes to thank her colleagues—Peter Minton, Brian McKernan, Teresa McTague, Rich Olsen, Joe Wallen and Kevin Werle—in the Enterprise Risk and Capital Management Practice at General Re and General Re New England Asset Management, for their contributions to this article.*

***“ERCM provides a framework, supported by analytics, to assist managers when rendering optimal/financial decisions. These decisions may be optimized as a portfolio of choices.”***

decisionmaker may introduce the constraints sequentially, observing the cost of each constraint. Also, the effect of the constraint on the ultimate decision set

caveat that it will be used for maximizing enterprise value. Over time they face many capital management decisions that present opportunities for taking on or

## LOMA Collaborates on New Reinsurance Designation

*continued from page 1*

Reinsurance Administrator's Roundtable, a determined group of industry executives representing many prominent reinsurers and direct writers. Each year for many years, this group met informally in Toronto (in conjunction with the Canadian Reinsurance Conference) to discuss common administrative concerns, problems, and solutions. The group eventually became the LOMA Reinsurance Administration Professionals Committee (RAPC), which is working with staff in LOMA's Insurance & Financial Services Programs (in the Education Division) to develop the ARA program.

The task of convincing the Roundtable that such a partnership was in the best interests of both entities was assigned to Ed Burns, Second Vice President, Operations Management Division, LOMA. Through Burns' and Dudgeon's efforts, the partnership was formed. LOMA agreed to sponsor the group as a committee, and the Re-insurance Administration Professionals Committee (RAPC) was born.

The RAPC met for the first time in Atlanta in October 1997. The focus of the initial meetings was collaboration with managers from LOMA's Education

- Regulation and marketing of reinsurance
- Reinsurance administration procedures

*Intro to Reinsurance* was a long-needed tool in reinsurance education, according to current RAPC Chair Maureen T. Shippy, FLMI, ACS, who is Assistant Vice President and Director, Individual Life Administration at Lincoln Re. "In the past," she said, "when new people were brought into any area of reinsurance, there was no Reinsurance 101, so to speak, to help them understand processes and procedures. This text covers the basics for people who need a solid introduction to reinsurance."

According to Jane Tiu, FLMI, ACS, Life Reinsurance Administration Director at Manulife Financial, Reinsurance Division, both the growing prominence of reinsurance within companies and the lack of educational reinsurance materials spurred the RAPC toward collaboration on an introductory text. "Reinsurance used to be a really small department, but now companies are beginning to realize how important reinsurance is as a tool to manage the bottom line," she said.

---

***"...the ultimate goal of improving their companies' operations through information sharing and creative problem solving, the Roundtable members began looking for a sponsor organization to partner with them and actively manage their meetings."***

---

With the ultimate goal of improving their companies' operations through information sharing and creative problem solving, the Roundtable members began looking for a sponsor organization to partner with them and actively manage their meetings. The members were also particularly concerned about the lack of continuing/professional education programs available to the reinsurance industry. The members wanted to play a significant role in developing education materials with their partner organization.

As a result, the Roundtable members appointed a Steering Committee, chaired by Nancy Dudgeon, FLMI/M, ACS, ALHC, CLU, Vice President, Consulting Services, Information Services Division, Manulife Financial, to search for potential partners. At an industry conference in 1997, Dudgeon met with Jim Foley, Senior Vice President, Management Resources Division, LOMA (now retired). Both Foley and Dudgeon agreed to pursue the partnership between LOMA and the Roundtable.

Division to put together content outlines and delivery timetables for *Intro to Reinsurance and Reinsurance Administration*. The RAPC planned to provide guidance and industry-specific information and to review the texts for accuracy and completeness. Review panels for each text were appointed for this purpose (see page 15).

### Intro to Reinsurance

Through cooperation and collaboration between the RAPC and LOMA's Education Division, *Intro to Reinsurance* became available in January 1999 as an introductory level text in LOMA's StepOne series. *Intro to Reinsurance* uses simple language and a reader-friendly manner to describe:

- Fundamental reinsurance concepts
- Industry terminology
- Reinsurance relationships
- Facultative and automatic reinsurance
- Proportional and nonproportional reinsurance

### Reinsurance Administration

Reinsurance Administration, a more in-depth course, is currently under development and will be available in June 2000, with the first examination to be administered in Fall 2000. Authors, editors, and managers in LOMA's Education Division are working closely with a 20-member review panel formed by volunteers from the RAPC to develop detailed, accurate, and current information on:

- Reinsurance regulation
- Reinsurance staffing and information systems
- Reinsurance treaty provisions
- Retention and risk management
- Administration of new business
- Administration of in-force business
- Quality control of reinsurance administration

*(continued on page 14, column 1)*

## LOMA Collaborates on New Reinsurance Designation

*continued from page 11*

A central purpose of the text is to provide uniformity and consistency in industry terms, definitions, and processes, according to Shippy and Tiu. The textbook highlights the key goal of increasing standardization within the industry, in their view.

As Tiu notes, *Reinsurance Administration* is a tool to help students truly understand how reinsurance administration affects an entire company. "Particularly in reinsurance, there is a close interconnection with other areas," she said. "For example, what we do in administration impacts underwriting, pricing, and valuation. This text helps

Administrators' Roundtable approached LOMA, they offered us a chance to learn exactly what the industry wanted and to respond by developing appropriate products."

Dennis W. Goodwin, FLMI, ACS, HIA, Assistant Vice President, Insurance & Financial Services Programs, agrees. "One of the strengths of LOMA's products is that each text we develop is a collaborative effort between our staff and industry experts," he said. "This joint effort between the RAPC and LOMA's Education Division helps us to ensure that these texts contain relevant, accurate information presented in a manner that

---

***"This joint effort between the RAPC and LOMA's Education Division helps us to ensure that these texts contain relevant, accurate information presented in a manner that best helps students learn."***

---

students understand those interrelationships. Also, helping everyone in reinsurance and in the insurance industry in general to understand what the administration staff does and how they do it will increase the importance of reinsurance administration and enhance its professional status, as well."

LOMA management and staff feel fortunate to be working with the RAPC on the reinsurance program projects, according to Joyce Abrams Fleming, J.D., FLMI, ACS, AIAA, ALHC, HIA, MHP, Director, Insurance & Financial Services Programs. "We are very excited about the opportunity to collaborate with such an enthusiastic industry group," said Abrams. "When the Reinsurance

best helps students learn."

William H. Rabel, Ph.D., FLMI, CLU, Senior Vice President, Education Division, also credits the RAPC with helping LOMA create texts that are valuable not only to reinsurance industry employees but to employees in the wider insurance industry as well. He said, "These texts will be useful in giving employees first a general overview of reinsurance administration and then a more detailed understanding of the procedures real companies use and the reasons for those procedures. *Reinsurance Administration* is especially strong in explaining how firmly reinsurers base their administrative procedures on their treaty arrangements."

## Current and Future Plans

While *Reinsurance Administration* is under development, students interested in earning the ARA designation don't have to wait until 2000 to begin working toward the designation. All of the requirements (except *Reinsurance Administration*) are currently available through LOMA.

Meanwhile, the collaboration between LOMA and the RAPC is continuing. The RAPC and LOMA will offer a workshop at the 1999 Canadian Reinsurance Conference to describe the cooperative text development activities in more detail.

In addition, the RAPC is working with LOMA's Operations Management Division in developing a new *Life Reinsurance Service Turnaround Times Survey* to add to LOMA's family of benchmarking surveys by line of business. A subcommittee of the RAPC will be meeting with Burns this month to design the survey. Burns plans to begin collecting the data this summer and to publish survey results by year-end.

*Guest authors are Edward T. Burns, Second Vice President, Operations Management Division, and Jennifer W. Herrod, Senior Associate, Insurance and Financial Services Programs at LOMA.*

*For more information about LOMA courses or other LOMA products/services, please call 800/ASK-LOMA or visit LOMA's web site at [www.loma.org](http://www.loma.org)*

**LOMA's new associate-level professional designation, Associate, Reinsurance Administration (ARA), can be earned through the successful completion of the following courses:**

- FLMI 280: Principles of Insurance: Life, Health, and Annuities
- FLMI 290: Life and Health Insurance Company Operations
- FLMI 301: Insurance Administration
- FLMI 361: Accounting and Financial Reporting in Life and Health Insurance Companies

Any one of the following:

- FLMI 310: Legal Aspects of Life and Health Insurance-U.S.
- FLMI 315: Legal Aspects of Life and Health Insurance-Canada
- AIRC 410: Regulatory Compliance: Companies, Producers, and Operations
- AIRC 420: Regulatory Compliance: Insurance and Annuity Products
- The new course, Reinsurance Administration

**Textbook Panel Members  
Intro to Reinsurance  
Review Panel**

Margaret Barry

The Canada Life Assurance  
Company

Diane Brule, FLMI/M, ALHC  
Optimum Re Insurance Company

Thomas J. Hartlett  
Cologne Life Reinsurance Company

Vincent J. Montelione, CPA, CLU,  
ChFC, ACS  
Security Mutual Life Insurance  
Company of New York

Maria Christina Mota, FLMI, ACS,  
HIA  
Gerling Global Life Insurance  
Company

Sandy Peterson  
Allianz Life Insurance Company of  
North America

Jane Tiu, FLMI, ACS  
Manulife Financial

Ava M. Zils, FLMI  
Security-Connecticut Life Insurance  
Company

**Reinsurance Administration  
Review Panel**

Anne Adler, FLMI  
Swiss Re Life & Health

Margaret Barry  
The Canada Life Assurance Company

Suzanne L. Bathke, ACS, CPIW  
Reassurance Company of Hannover

Randall M. Benton, FLMI, ALHC  
Munich American Reassurance  
Company

Candace Bohlman  
Hartford Life Insurance Company

Diane Brule, FLMI/M, ALHC  
Optimum Re Insurance Company

Diane Currier  
The New England

Jill Dupuis, ACS  
Manulife Reinsurance

Thomas J. Hartlett  
Cologne Life Reinsurance Company

Amanda Jones  
Sun Life Assurance Company of  
Canada

Jennifer Jones-Lapointe, FLMI/M, ACS,  
ALHC, HIA  
Employers Reassurance Canada  
Management Services

Emmanuel Kintu, MBA, HIAA  
RGA Reinsurance Company

Rositta Kraml, FLMI  
Winterthur Life Re Insurance

Vincent J. Montelione, CPA, CLU,  
ChFC, ACS  
Security Mutual Life Insurance  
Company of New York

Maria Christina Mota, FLMI,  
ACS, HIA  
Gerling Global Life Insurance  
Company

Sandy Peterson  
Allianz Life Insurance Company of  
North America

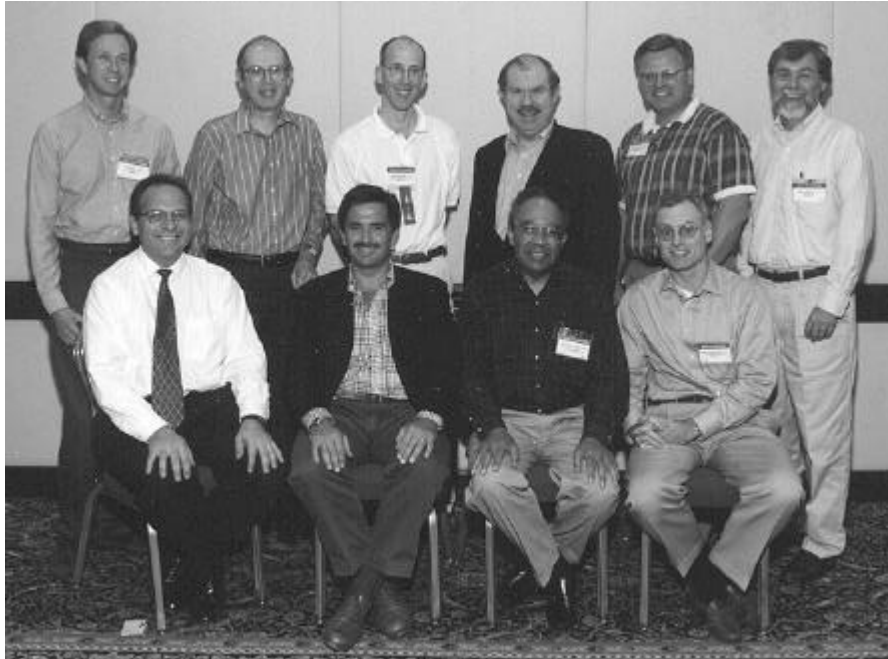
Michael R. Slater, ASA, MAAA, EA,  
FLMI  
Munich American Reassurance  
Company

Jane Tiu, FLMI, ACS  
Manulife Financial

Melanie Tullet, FLMI, ACS  
Swiss Re Life Canada

Ava M. Zils, FLMI  
Security-Connecticut Life Ins. Co.

# ***The Reinsurance Section Council Meeting in New York***



*Members of the Reinsurance Section Council gathering in New York to plan the section activities for the coming year.*

*Standing—Left to Right—James Keller, Jack Bailey, Graham Bancroft, Bob Tiessen, Bill Wellnitz (1998-99 Section Chair), Michael Lachance*

*Seated—Left to Right—Pault Nitsou (1997-98 Section Chair), Michael Pado, Michael Winn, Bryan Featherstone*



475 North Martingale Road, Suite 800  
Schaumburg, IL 60173-2226  
847/706-3500  
[www.soa.org](http://www.soa.org)