

On August 9, 2011, SCOR SE, a global reinsurer with offices in more than 31 countries, acquired substantially all of the life reinsurance business, operations and staff of Transamerica Reinsurance, the life reinsurance division of the AEGON companies. The business of Transamerica Reinsurance will now be conducted through the SCOR Global Life companies, and Transamerica Reinsurance is no longer affiliated with the AEGON companies.

While articles, treaties and some historic materials may continue to bear the name Transamerica, AEGON is no longer producing new reinsurance business

# The Messenger

Transamerica Reinsurance Risk Management Newsletter

## New Options in Reserve Financing

In recent years, a few large life insurers and reinsurers have successfully turned to the capital markets for collateral financing for redundant XXX reserves. The resulting securitizations – both non-recourse and the more prevalent private placement transactions – have drawn much attention to the converging life insurance and capital markets. These deals also highlight the benefits available to companies that have the ability to tap into the resources of the capital markets.

While the current financial environment is having a significant pricing impact on reserve financing deals, it likely will not alter the inevitable course toward conversion. Life insurers large and small will have to learn how to take advantage of a new way of doing business – whether that means developing financing solutions on their own, or alternatively, working with a reinsurance partner.

Transamerica Reinsurance/AEGON has closed seven capital markets transactions since 2004 – both recourse (private placement) and non-recourse structures – totaling \$7.9 billion in collateral financing. These funding structures have been and continue to be an essential component of the coinsurance programs we offer our clients. Furthermore, the experience we have gained in executing these structures enables us to develop “next generation” reinsurance solutions that extend the benefits of new financing programs to companies that may not be able to develop and execute them on their own.

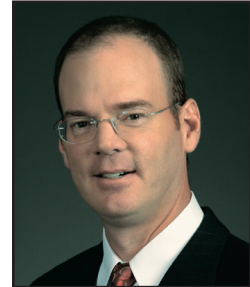
We now offer a Term Notes Program that leverages our expertise in both mortality risk management and capital markets financing. This combination of expertise positions us to deliver advantages over programs offered by investment banks or commercial banks. Our program compares highly favorably to other reserve financing options, most notably in tax efficiencies, lower capital levels for funding the structure and faster release of dividends from the captive company. In addition to (or because of) these benefits, our Term Notes Program also provides clients with:

- Scalable mortality protection
- Lower start up costs
- Lower execution risk
- Operational leverage
- Revenue and earnings growth
- Better return on investment

### Next Generation Reinsurance

Life insurers have used coinsurance for some time now to address XXX reserve financing requirements, and coinsurance continues to be a viable solution for many

*Continued next page*



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## New Options in Reserve Financing (cont)

*Editor's note: See the latest issue of The Forecaster for an interview with Scott Avitabile, Partner at Dewey & Leboeuf, LLP. Scott has worked on several securitization.*

companies. However, the need for new reinsurance solutions intensifies as companies hold more of the mortality risk and look to maximize top line growth and product profitability. Our new Term Notes Program unlocks value not available to clients in a traditional coinsurance transaction.

**The tax reserve advantage:** Everyone is familiar with the humpback reserve graph that compares statutory and economic reserves as a way to illustrate redundancy. The tax reserve associated with XXX business follows the steep statutory reserve line. Yet tax reserves do not come into play in today's coinsurance arrangements, which utilize offshore reinsurance facilities. The new reserve financing programs, which utilize onshore captive facilities, feature tax efficiencies that can positively impact product performance.

**Less trapped capital:** A captive facility that funds the reserve credit trust is an essential component of all recent reserve financing solutions. The amount of capital that an insurer needs to place in the captive is the single biggest determinant of return on investment. Because of our distinct expertise in evaluating and quantifying mortality risk, our program requires lower levels of capital than programs involving either investment banks or commercial banks. This means our clients have less capital trapped in the structure – capital that can be put to use elsewhere.

**Lower execution risk:** Ease of execution is another key benefit of the Term Notes Program. Transamerica Reinsurance purchases the notes, facilitates program execution and performs many of the analytical prerequisites utilizing internal expertise without the need for third parties. This significantly reduces the number of parties involved in the transaction, leading to lower execution risk and lower upfront costs.

**Lower funding minimums:** Scale is the biggest reason that many companies cannot participate in structured reserve financing deals. For example, a non-recourse securitization typically requires a minimum funding need of \$500 million; a recourse transaction with a commercial bank needs a minimum of \$250 million. By comparison, our Term Notes Program is viable for companies with funding needs as low as \$50 million. That's because the system remains open to new blocks of business. As a reinsurer with vast expertise in mortality risk management, we are comfortable aggregating smaller blocks and, in doing so, making the benefits of new reserve financing programs available to many more companies.

**Early dividend release:** Another advantage of our program is the release of dividends as early as year two of the deal, versus year seven or eight as is standard from investment or commercial bank programs. The early release of dividends reflects our ability to evaluate and quantify mortality risk and thereby ensure the quality of the business housed in the structure.

The new reserve financing programs are complicated and difficult to execute. They demand an exceptional combination of skills, resources, innovative thinking and risk management discipline. But in order to remain competitive and achieve profit goals, companies must have the means to access these programs.

At Transamerica Reinsurance we see the convergence of life insurance and capital markets as an opportunity to strengthen client partnerships with high value solutions. We have made a significant capital investment – both financial and intellectual – in meeting the needs of our clients, and we look forward to sharing the details of our new reserve financing program. ■

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### The Messenger

Transamerica Reinsurance Risk Management Newsletter

The Messenger is produced by the Marketing Communications department of Transamerica Reinsurance. Matthew Hughes and Christian Kendrick are the editors. If you have questions or would like to be added to or removed from the mailing list for The Messenger, please send your inquiries with name, company name and mailing address to Matthew.Hughes@Transamerica.com or Christian.Kendrick@Transamerica.com

# Preparing for Principles-Based Capital

As our industry moves towards a principles-based approach to valuation, many life insurers have focused on its potential effect on reserves. However, work is currently under way to apply similar principles to required capital, with similar expected results. But whereas plans for principles-based reserves will initially apply to new business only, proposals for principles-based capital (PBC) are currently targeting both new and inforce business.

As with principles-based regulations for reserves, PBC recommendations are still works in progress. However, information currently available points to several implications that life insurers will need to address.

## Background

The American Academy of Actuaries originally directed the Life Capital Work Group (LCWG) to evaluate the interest-rate and market risk (C3) component of the current RBC framework in the context of a principles-based approach. Their work is part of the C3 Phase 3 project. The focus eventually expanded to include a portion of C1 (asset market and credit) risks. The LCWG is currently targeting C3P3 implementation for year-end 2009.

Efforts on PBC mirror general efforts of the Life Reserve Work Group to establish rules for principles-based reserves. Current RBC rules are formula-driven, but it is expected that the principles-based approach will incorporate a stochastic-based methodology, which will include updated modeling assumptions as they emerge and become credible.

## NAIC RBC and Volatility

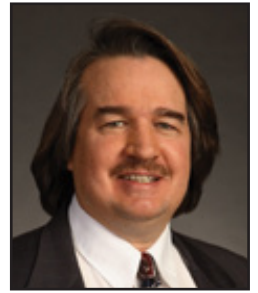
Changes in RBC have been, and will most likely continue to be, applied by line of business (i.e., life, annuities, etc.) regardless of issue era. Therefore, it is reasonable to expect shifts in RBC when converting from a formulaic to a principles-based NAIC capital requirement.

Once PBC requirements are implemented, larger swings in required capital may occur from year to year. This is due to the inherent stochastic modeling volatility, which is compounded by frequently updated modeling assumptions. And, unlike principles-based reserving that affects only prospective new business, volatility in capital requirements may affect all inforce business for the given line.

## Current Pricing Considerations

Business issued today is priced based on well defined capital requirements. But required capital for today's new business will change as PBC is implemented. Therefore, PBC may present a "current" pricing risk. If changes in underlying modeling assumptions and stochastic variances result in increased capital requirements not factored into current pricing, then today's new business could be underpriced. Consider also that unforeseen increases in policy lapsation may result in elevated mortality rates on the remaining business, further increasing per-unit capital requirements above original pricing assumptions.

As details emerge on the direction for PBC, we look forward to working with our clients on evolving implications and how we can work together to ensure continued success. ■



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# Credibility Analysis for Mortality Experience Studies, Part 1



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The bane of pricing actuaries is their desire for more and more data in a preferred risk environment that is designed to produce fewer and fewer deaths. Previous mortality experience can be a reliable indicator of the future performance as long as one understands the potential variability in these future results. To that end, I would like to discuss the theory that actuaries often use to analyze the credibility of their mortality studies.

## Mortality as a Binomial Process

Consider a random experiment, the outcome of which can be classified in only one of two mutually exclusive ways. Since we are applying this theory to mortality, we will use the morbidly descriptive titles “dead” or “alive.” We have the following conditions:

- Assume that we have  $n$  independent trials and we count the number of deaths over some time period. For a mortality study, each trial represents a risk with the probability of either dying or living during a specified time period, which is typically one calendar year.
- Let the probability of dying =  $q$ , and the probability of living =  $p$ . Note that  $q + p = 1$ .
- Let the random variables  $X_1, X_2, X_3, \dots, X_n$  be mutually exclusive stochastic (i.e., random) events where  $X_i$  equals 1 if death occurred and 0 if no death occurred.

If the above conditions are met, then the random variable  $Y$ , which we set equal to the sum of the  $X$ 's, has what statisticians call a binomial distribution. Because of the way we assigned values to the  $X$ 's,  $Y$  equals the number of deaths that occur among our  $n$  risks. In mathematical terms, the probability that our random variable  $Y$  equals a specific value  $y$  can be written as:

$$\Pr(Y = y) = (\text{"}n \text{ choose } y\text{"}) * q^y * p^{(n-y)}$$

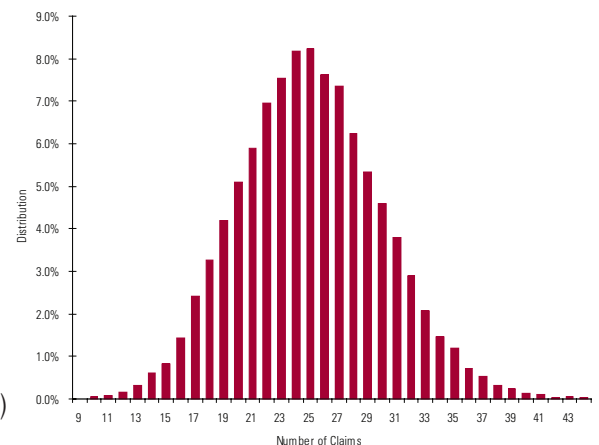
Plainly speaking, this means: take all the possible ways you can choose  $y$  risks out of a group of  $n$  risks and multiply that by the probabilities that (i) all of the  $y$  risks die and (ii) all of the remaining  $(n-y)$  live. The number of claims is binomially distributed with a mean value of  $(n * q)$ . More importantly, the binomial has an easily calculated variance of  $(n * q * p)$ . The standard deviation, which is the square root of the variance, is a measure of the inherent variability of the outcome of our mortality “experiment” and provides the basis for discussions on credibility.

## An Example

Before we go any further, a sample experiment may help demonstrate these concepts. Consider the following parameters:

- 20,000 risks ( $n$ )
- Probability of death is 0.00125 ( $q$ )
- Probability of living is 0.99875 ( $p$ )
- The theoretical mean of the distribution is 25 ( $n * q$ )
- The theoretical standard deviation of the distribution is 5 (square root of  $[n * p * q]$ )

Chart 1 shows the results of 10,000



independent experiments on these 20,000 risks by graphing the resulting claim count distribution.

With 10,000 experiments, our sample statistics should closely match theoretical values. In fact, the mean number of claims from our 10,000 experiments is 25.02 and the standard deviation is 4.96, which tie to the theoretical mean 25 and standard deviation of 5.

If you would like more information, you may contact the author at David. Wylde@Transamerica.com or

### Standard Deviation as a Measure of Credibility

We can create a “credibility measure” to help understand the variability of these results by taking the ratio of the standard deviation over the mean. A highly credible experiment would be where the range of outcomes as a percentage of the mean is very low. In other words, the distribution of the number of deaths is tightly packed around the sample mean. For our current example, the number of deaths as a percentage of the mean varies quite a bit.

Approximately 70 percent of our results are inside plus or minus 20 percent (i.e., inside the range of 20 to 30 claims).

Thus, if I were to predict the number of deaths in a given random sample within a range of plus or minus 20 percent, I would be wrong 30 percent of the time.

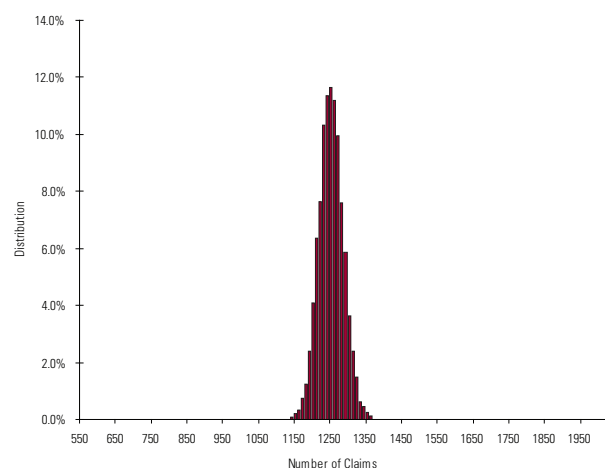
Our credibility measure is mathematically equivalent to the square root of ( $p / \# \text{ deaths}$ ), which can be simplified further to ( $1 / \text{square root of } \# \text{ deaths}$ ) because  $p$  for mortality studies is typically close to 1. Chart 2 shows our credibility measure for different size experiments using the same probability of death as our current example.

So, if the number of risks in our experiment was 1,000,000 and I were to make an advance guess of the results of one particular random sample within a range of only plus or minus 2.8 percent of the mean, I would be wrong 30 percent of the time. However, a better way to describe this might be to say that my guess within a range of plus or minus 20 percent of the mean would be correct more than 99.99999 percent of the time. Thus, as the number of deaths increases, I can be more confident in my prediction of the results of any one particular random sample. Chart 3 graphically demonstrates this statement.

**Chart 2 - Credibility Measure for Various Size Experiments**

	Values of n					
	5,000	10,000	20,000	50,000	100,000	1,000,000
Mean	6	13	25	63	125	1,250
Standard Deviation	2	4	5	8	11	35
Credibility Measure	40.0%	28.3%	20.0%	12.6%	8.9%	2.8%

**Chart 3 - Distribution of Number of Claims from 10,000 Experiments**



### Relationship to Mortality Studies

This article has explained some of the basic tools that actuaries use to project variability around predicted mortality. Simply stated, a mortality study is nothing more than the result of one random sample from a large universe of possible outcomes. The actuary’s job is to describe how well that one sample represents the universe and to what degree that sample’s results can be used to predict future outcomes. In Part 2 of this series I will build upon these fundamental concepts by discussing what exactly is meant by the term “fully credible” when applied to mortality studies. ■

# Best Practices for an Underwriting System



**By Andrea Moody,**  
**FLMI, FALU, AIRC, ACS**  
*Director, Underwriting Standards*

The right underwriting system seamlessly integrated into the new business process can enhance a company’s bottom line from increased accuracy to tighter oversight to stronger reinsurance relationships and potentially better reinsurance pricing. Transamerica Reinsurance has collaborated with clients to develop such systems from the ground up as well as acting as a consultant to assist in improving existing systems. It’s a win for the client, the reinsurer and the profit margin.

Changes in the underwriting environment place greater demands on staff and management. Treaties are tighter than ever. Staff members are working from home and contractors are floating in and out of the landscape, all while reinsurers are knocking on your door. A state-of-the-art underwriting system, including a rules engine, is a must in today’s life insurance environment. What’s more, underwriting systems aren’t just for assessing risks. The newest and best underwriting systems can actually aid in the management process.

**Let the system do the grunt work.** Unlike earlier attempts to automate impairment underwriting, today’s engines are designed to automate preferred class underwriting (including internal stretch criteria). With the right teleinterview system, answers to questions and details can be transmitted as data directly into the underwriting rules engine and affirmative answers can be captured along with detailed drill-down responses. With electronic feeds to third party vendors, lab results and vitals are automatically sent and run against the company-specific underwriting rules. As a result, underwriting professionals can concentrate on the most critical aspects of a risk by reviewing a single screen that summarizes medical information which falls outside of the company’s underwriting guidelines. Processing time is reduced, placement rates are increased and at the same time accuracy is improved.

**Two systems in one.** An underwriting system doesn’t have to be limited to making risk assessment decisions. It can be just as effective as an underwriting management tool. A good system will make note when the underwriter approves a case outside of certain guidelines and can track system overrides. Managers can look for patterns in underwriter behavior and training opportunities with the use of a few well-designed reports (see Figures 1 and 2). And

For more information on optimizing investments in underwriting technology, click on the webinar “Managing Mortality and Improving Profitability” on our website, [www.TransamericaReinsurance.com](http://www.TransamericaReinsurance.com).

## Underwriting Auditor Summary

UW 3/3/2008

Filter On	
Case From	3/1/2008
Case To	3/3/2008
Underwriter	01
Company	01
Auditor	01

Assigned UW	Cases Approved	Cases Audited	Score=0	Score=1	Score=2	Score=3	Score=4	Score=5	Score=6
UW - Galt, Brian, Entitas	188	96	91	2	0	0	0	1	0
UW - Givens, Emily	111	12	12	0	0	0	0	0	0
UW - Gueller, Faria	166	96	95	1	0	0	0	0	0
UW - Gullone, Kelly	179	97	96	1	0	0	0	0	0
UW - Givens, Hillary	125	19	18	1	0	0	0	0	0
UW - Givens, Jerry	129	19	18	1	0	0	0	1	0
UW - Jones, Bridget	161	97	97	0	0	0	0	0	0
UW - Dukes, Denise	172	60	57	2	0	0	0	1	0
UW - Foyens, Sandra	91	11	11	0	0	0	0	0	0
UW - Givens, Barbara	57	16	11	2	0	0	0	1	0

all of this can be done monthly, weekly, even daily. Such capabilities go a long way toward managing a company’s overall risk assessment practices because it essentially evaluates every case the underwriters touch.

**A host of side benefits.** A well integrated underwriting system can provide much needed reassurance to new staff members and temporary contractors. Using “error message” capability, the system can prevent underwriters from approving cases over their authority or require second signatures for underwriting exceptions. Another bonus is the portable nature of these systems using web-based technology. With the rise in work-from-home models, companies that don’t offer a portable system may find it hard to attract viable candidates and possibly keep the experienced underwriters they already have. Last but not least is the added benefit to the reinsurance relationship. Such systems can help a company adhere to treaty parameters such as retention, autobind and jumbo limits. In addition, a company can provide real-time oversight information during reinsurance negotiations – such transparency could even aid in better reinsurance mortality pricing. Transamerica Reinsurance has underwriting programs in place with clients that allow us to provide audits in real-time, decreasing the need for onsite audits.

A decade ago, complaints against automation usually revolved around one thing: money.

Case Number	Applicant/Type	Applicant/Line	Final Action By	System Recommendation	Final Action	Case Completion
17021274	CAF	FFC44-24	LNW-Clark, Jerry	SHT Surety Non-Indicia	SHT Surety Non-Indicia (Rural)	None
1992294	MC-TR	SA-PS-04	LNW-Quindi, Jerry	SHT Surety Non-Indicia	SHT Surety Non-Indicia	Same
1922128	BCB	MCPT	LNW-Po-sing, David	SHT Surety Non-Indicia	PPH Final Plus Non-Indicia	Same
2012111	DAUC-04	HINS	LNW-Cytilled, Entery	PPH Final Plus Non-Indicia	PPH Final Plus Non-Indicia	Same
1922112	JE-MS	CO-MSY	LNW-Su-sant, Kurtis	PNT Final Non-Indicia	PNT Final Non-Indicia	Same
1622024	TE-04	CEL-04-04	LNW-Clason, Hilary	SHT Surety Non-Indicia	PNT Final Non-Indicia	Same
1772224	BC-04	BC-04	LNW-Jones, Blake	SHT Surety Non-Indicia	PNT Final Non-Indicia	Same
1822222	EA-04-04	HU-04-04	LNW-Cullum, Tony	PT Premium Indicia	PT Premium Indicia	Same
1922111	FF-04-04	FF-04-04	LNW-Cytilled, Entery	SHT Surety Non-Indicia	SHT Surety Non-Indicia (Rural)	None
1911104	MC-TR	SA-PS-04	LNW-Po-sing, David	PT Premium Indicia	ST Surety Non-Indicia	None
1722176	TR-TR	QML-04	LNW-Quindi, Jerry	SHT Surety Non-Indicia	SHT Surety Non-Indicia	Same

The systems were expensive to purchase, and the time and costs involved in integrating and tailoring the systems to a specific company’s underwriting practice just could not be outweighed by the benefits that such systems bring to an underwriting shop. Today, systems are more reasonably priced and integration has been made simpler through many systems’ language compatibilities, such as XML. Today there are few justifications for any company not to seek greater automation in their underwriting. ■

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## Quest Examines the Older-Age Market

Quest 2008 meeting series is focusing on issues surrounding the older-age market for life insurance and have already been held in Cincinnati and Minneapolis. Future meetings will be held in Des Moines, New York, Boston and Hartford later this year. For more information on Quest, visit us at [www.TransamericaReinsurance.com/Quest.aspx](http://www.TransamericaReinsurance.com/Quest.aspx). ■

## Online Special Report: Underwriting Trends for Older Age Applicants



By **Kenneth Conners**  
**CLU, FALU, FLMI**  
Vice President and Chief  
Underwriting Officer

Transamerica Reinsurance has published a report on underwriting trends for older age applicants. Key takeaways from the report include:

- **Traditional medical underwriting is not as effective at assessing older age risk, especially preferred.** Medical underwriting loses some of its protective value in underwriting older age applicants. In some cases, values can be reset to new levels, but in other cases certain tests may provide little if any value.
- **Insurers are seeking ways to improve underwriting seniors.** Some companies are asking questions to determine frailty. Other companies are investigating the protective value offered through cognitive and functional testing. And companies are incorporating different lab tests to gain further insight into a senior's risk profile.
- **Financial underwriting has taken on greater importance.** Life settlements and stranger-owned life insurance (STOLI) have increased the importance for underwriters to understand a senior's motivation for seeking coverage late in life. In an effort to control for STOLI, life insurers are modifying their application questions, altering product designs, and working with state governments to regulate insurance and settlement sales.

For a copy of the full report, visit the Spotlight section of our website at [www.TransamericaReinsurance.com](http://www.TransamericaReinsurance.com). ■



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