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Product Matters!

SOCIETY OF ACTUARIES

PRODUCT DEVELOPMENT SECTION

Stochastic Modeling is on the Rise

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By David Wylde and Mike Failor

Product Matters!

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To join the section, SOA members and non-members can locate a membership form on the Product Development web page at www.soa.org/product-development.

Chairperson's Corner

By Jeremy Bill

The life insurance industry is currently in the midst of a period of significant change. It seems like change is occurring in virtually every part of our business: from the way that we attract new customers, to the way that those customers are underwritten, and even how we calculate the reserves once policies are issued.

Through all of this change, the Product Development Section continues to provide value to our members through the work we are doing. As I've seen firsthand over the last three years, there are numerous volunteers who work throughout the year to help support our members during this season of change.

While I certainly can't list all of the accomplishments of the Product Development Section, I do want to highlight a few significant areas of change and the tools we are providing to our members to help navigate this change.

REGULATORY CHANGES

A number of regulatory items will change our work in the coming years. One of the biggest changes most certainly will be the move from a formulaic approach to calculating life insurance reserves to a principle-based approach. The effective date for principle-based reserves (PBR) is Jan. 1, 2017, which marks the start of a three-year transition period for moving to PBR. This change also involves a move from the 2001 CSO mortality table to the 2017 CSO mortality table over the same time period.

The Product Development Section has provided a number of items to assist its members as they navigate this move to PBR. In the July 2016 issue of *Product Matters!*, we included articles related to assumption documentation, VM-20 and 2017 CSO. We also help to fund research projects that dig even deeper into topics related to PBR. For example, we have sponsored a research project titled, "Impact of VM-20 on Life Insurance Product Development," which provides insight into how companies will incorporate PBR into pricing. The results were presented at the Valuation Actuary Symposium and the Society of Actuaries (SOA) Annual Meeting & Exhibit and will be included in a webcast in December.

CHANGES TO UNDERWRITING

Another significant area of change is in the area of underwriting. The tools that we are using to evaluate risk continue to evolve and will likely look much different in the coming years.

For the last four years, the Product Development Section has sponsored a specific meeting devoted to this topic. I was able to attend the Underwriting Issues & Innovations Seminar this past August in Chicago, and I found it to be a great meeting to hear the latest developments related to underwriting and to connect with others from a variety of other disciplines (underwriters, doctors, geneticists, etc.). Planning is already underway for the 2017 seminar, so I would encourage you to attend this seminar next summer.

The Product Development Section also supports research that is related to developments in the area of underwriting. We have partnered with other sections to fund a research project titled "Genetic Testing, Family History and Mortality." We feel this type of research will be extremely important to product development actuaries as underwriting continues to evolve.

PREDICTIVE ANALYTICS

One emerging area of work for actuaries relates to predictive analytics and predictive modeling. Earlier this year, the SOA announced a revision to the curriculum for candidates pursuing any of the SOA designations that include a significant emphasis on predictive analytics. In making this announcement, then SOA President Craig Reynolds stated, "The SOA believes it is essential that all aspiring actuaries gain critical new analytics skills as part of their basic 'tool kit' for being an actuary."[1]

In addition to the broader emphasis on this topic from the SOA, the Product Development Section has also provided tools to help our members gain confidence in this area. In August 2016, we helped sponsor a webcast on "Practical Considerations for Basic Predictive Modeling." We are also sponsoring research on "Use of Predictive Analytics." As you can see, our focus has been on providing practical ways that product development actuaries can use predictive analytics in the "real world."

As my time on the Product Development Section Council comes to a close, I am confident that the section will continue to look for ways to provide value to our members. If you have any ideas for how we can do that better, please feel free to reach out to one of the members of the section council listed on the inside cover of this newsletter.

I've appreciated the opportunity to lead the section over the last 12 months, and I look forward to seeing the great things the section will do for our members in the years to come. ■

ENDNOTES

[1] Email from Craig Reynolds on 7/5/2016 titled "Plain Talk—Curriculum Review."

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Stochastic Modeling is on the Rise

By David Wylde and Mike Failor

Stochastic modeling is on the rise in the life insurance industry due to a coalescence of regulations on the horizon and an increasing demand for stochastic analysis in many internal modeling exercises. While regulatory developments across the globe certainly have played a part in this increased interest, there are plenty of other reasons why stochastic modeling proficiency is growing among both actuarial modelers and those who interpret stochastic results.

This topic continues to garner attention as the industry increasingly relies upon stochastic models to value its business, design its products, and manage its portfolios. It appears that stochastic models gradually are becoming the industry norm for internal metrics since deterministic models often cannot adequately quantify the risk profile of the industry's increasingly complex business.

STOCHASTIC MODELING PROLIFERATION

As with many other industry trends, regulatory considerations will play a pivotal role in the increasing interest in stochastic modeling. Regulatory bodies in both the European Union (EU) and the United States continue to propose new stochastic modeling requirements, joining efforts from other nations worldwide.

Figure 1
Uses of Internal Stochastic Models

Tail risk analysis
Hedging strategies
Product pricing and design
Business mix optimization
Risk-adjusted merger and acquisition (M&A) pricing
Evaluation of reinsurance programs
Risk structure optimization
Calculation of diversification effects
Corporate strategy development
Risk-adjusted performance measurements and targets
Management compensation strategy
Satisfying parent company requirements

The benefits of incorporating stochastic modeling enterprisewide expand well beyond simply preparing for possible regulatory changes. Though we mention a dozen in this list, we easily could have included many more.

The EU is internally aligning its capital requirements under Solvency II, and the National Association of Insurance Commissioners (NAIC) has introduced VM-20 to address life insurance statutory reserve requirements. Each approach permits the use of internal stochastic models. VM-20 calls for stochastic modeling of economic risks, but does not require stochastic modeling of mortality risk (however, a company may elect to do so). Each of these regulations, when fully implemented, will significantly expand the use and importance of stochastic models.

Leaving aside these looming regulatory changes, however, companies are discovering stochastic models' value to an organization's cash flow projections and risk management activities. Insurers are expanding their use of internal stochastic models as available tools and computing power make this modeling more feasible. Companies are implementing stochastic models not only to determine economic capital, but also to use in product development areas. In reinsurance units, nonproportional reinsurance programs such as stop-loss and catastrophic coverages may necessitate stochastic modeling for both pricing and valuation.

NEED FOR CONTINUED RESEARCH

Given these and other reasons for the ongoing proliferation of stochastic models, the life insurance industry still has room to expand its stochastic modeling knowledge and techniques. While the stochastic modeling of market and credit risks is fairly well established, stochastic modeling of mortality is not as fully developed. In fact, most published research regarding stochastic mortality modeling either has been across general population segments where there are no underwriting selection effects, or has been conducted on longevity risks covering pensioners or annuitants.

Both of these approaches pose challenges. Research on general populations, pensioners and annuitants does not carry over well to the stochastic modeling requirements of fully underwritten life insurance. These insured populations have distinctly different mortality characteristics that require partitioning by product, underwriting class, distribution channel, policy issue year and policy duration. Similar to deterministic modeling, such partitioning should consider the level of credibility within the partitioned segments when determining stochastic distribution metrics such as means and variances. Adjoining segments may need to be combined when segmented credibility is low.

Another consideration that affects fully underwritten portfolios is policyholder lapsation. For example, lapse rates are typically very high at the end of level period for term life insurance products. These rates are difficult to model because they depend upon a number of factors, most of which are highly dependent upon post-level period premium increases and the insured's health status. This is typically not a concern when stochastically modeling general population segments or annuitants.

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A good introductory resource addressing stochastic mortality for underwritten life portfolios is a document produced by Ernst & Young LLP titled, "Stochastic Analysis of Long-Term Multiple-Decrement Contracts," published by the Society of Actuaries in 2008. This report evaluates stochastic modeling of life insurance nonmarket risks (i.e., mortality and lapse). It lays out the primary issues and describes potential modeling solutions. However, it also recognizes the need for an increased understanding of the sensitivities associated with stochastic mortality model design. Suggested areas of research are selection of stochastic variable probability distributions, stochastic variable correlations, and other relatively uncharted terrain for fully underwritten life insurance.

The benefits of stochastic modeling cannot be overstated. We have touched on only a few of these benefits, but certainly could have extended the discussion into various areas of pricing, valuation and stakeholder interest.

Last but not least, ratings agencies have been increasingly supportive of the improved risk management metrics derived from stochastic modeling, making it even more vital that companies continue to develop their internal stochastic models to keep pace with what is rapidly becoming an industrywide best practice.

MONTE CARLO SIMULATION

Having set the stage as to the "whys" of stochastic modeling let's discuss some of the "hows," presenting a practical example of designing a stochastic model of death benefits on fully underwritten life insurance.

Stochastic models typically incorporate Monte Carlo simulation to reflect complex stochastic variable interactions in which alternative analytic approaches would be either unworkable or untenable at best. For the illustrative projection discussed in this article, we developed a Monte Carlo simulation model to stochastically project 30 years of annual claims on a large, fully underwritten, term life insurance portfolio. The implemented modeling process can be described in the following four high-level steps:

1. Input variable analysis and specification
2. Random sampling of input stochastic variables
3. Computation of death benefit projections
4. Aggregation and analysis of results

INPUT VARIABLE SPECIFICATION

We define input variables as either stochastic or deterministic. Deterministic variables are assigned a predetermined fixed value or may be the result of a fixed nonrandom formula. Stochastic input variables are assigned statistical distributions and may correlate with other stochastic variables.

In our model, we defined three stochastic input variables: base mortality rate, mortality improvement rate and catastrophic mortality rate. We also defined one deterministic variable: policy lapse rate.

DETERMINISTIC POLICY LAPSE RATE VARIABLE

We could have modeled policy lapse rates stochastically based upon some real-world model of policyholder behavior. However, determining appropriate statistical distributions and correlations for our particular project proved to be difficult: The policyholder's decision to lapse term insurance is typically not driven by external fluctuating forces such as interest rates or stock market indices, but by other less tractable criteria. We chose instead to use predetermined best estimate lapse rates in the Monte Carlo simulation to lapse individual policies randomly.[1]

STOCHASTIC BASE MORTALITY VARIABLE

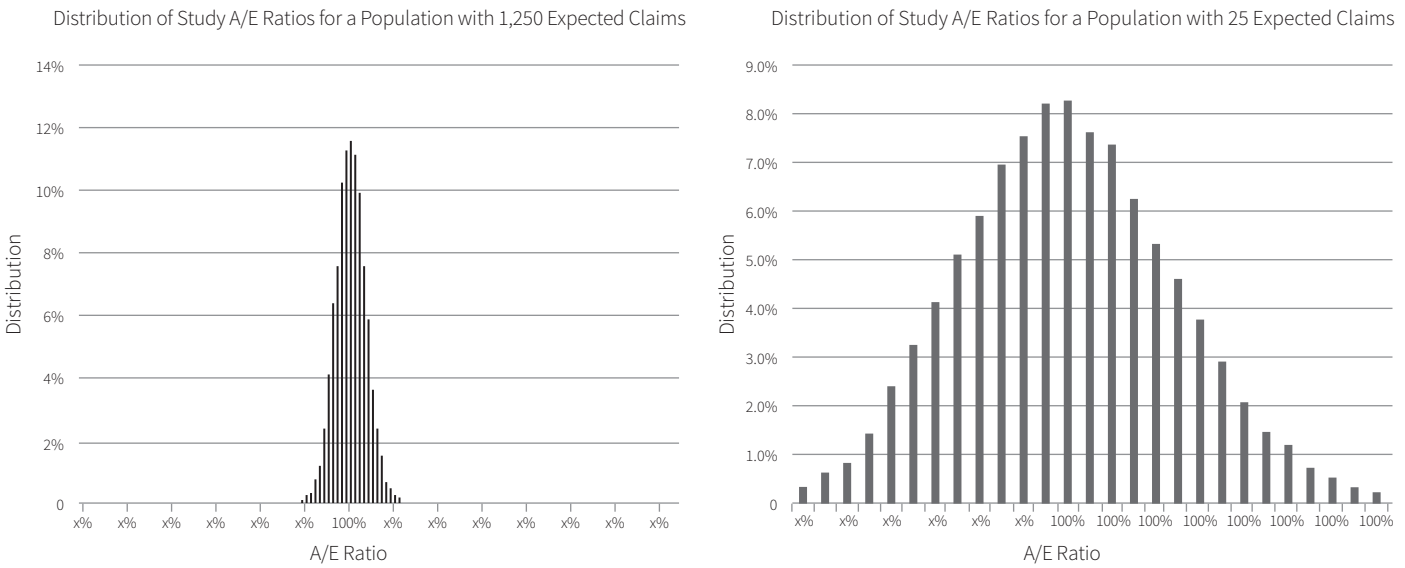
This stochastic variable reflects the uncertainty in determining an underlying best estimate mortality assumption for our portfolio. For this exercise, we referenced a recent mortality experience study for the portfolio. We can think of a mortality study as one random sample from the portfolio's "true" mortality. Just as with any random sample, uncertainty exists as to whether the sample is a good representation of the population (Figure 2). The left chart in Figure 2 shows the range of actual-to-expected (A/E) ratios that an experience study might produce for a portfolio where we expect only 25 claims. The right chart shows the range for a portfolio with 1,250 expected claims. The uncertainty about a particular study's credible representation of the population is a function of the expected claim count, and decreases as the count increases.

We can model this uncertainty stochastically. With mortality as a binomial process, the experience study's overall mortality is our mean assumption and $1 / \sqrt{(\#\text{claims})}$ is an approximation to its standard deviation. Then, for a given stochastic iteration, we used the normal approximation to the binomial to randomly select a base mortality assumption for that iteration).[2]

STOCHASTIC MORTALITY IMPROVEMENT RATE VARIABLE

In our model, mortality improves as we project our portfolio into the future. However, just as with base mortality, uncertainty surrounds the rate at which this improvement will occur. We calculated long-term mean improvement rates, along with corresponding standard deviations, based upon an analysis of U.S. population mortality. We reviewed historical trends over the past 20–30 years to select appropriate periods for the analysis (3). A significant and seemingly permanent change in the pattern of mortality occurred around 1982, so we used data from only 1982 to 2007 in our analysis. For this period, we determined that trended mortality had an annualized mean improvement rate of 0.8 percent with a standard deviation of approximately 0.4 percent.

Figure 2
Distribution of Experience Study A/E Ratios



The uncertainty surrounding a particular study's credibility in representing the population is a function of the expected claim count. The lower the count (left), the greater the uncertainty.

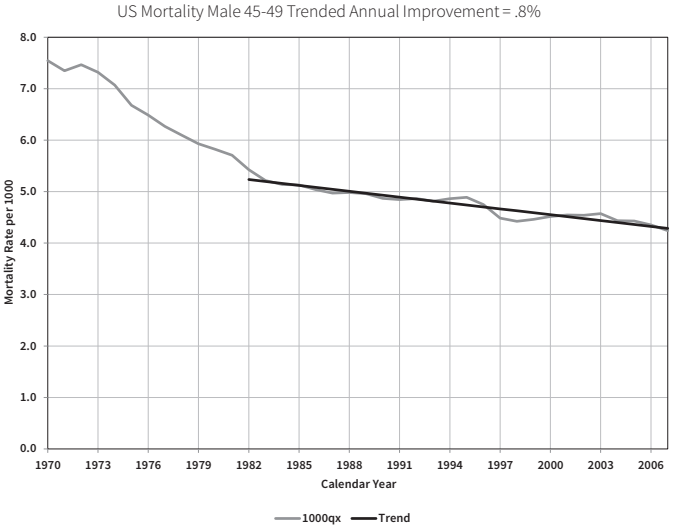
Mortality improvement rates vary significantly by attained age, so we created a vector of improvement assumptions by age group. Recognizing that mortality improvement is correlated among age groups, we also determined a correlation matrix reflecting historical correlations in improvement rates.

Using the U.S. population data, we determined that a normal distribution best represented the fluctuation of improvement rates around the long-term mean. Given the mean and standard deviation parameters, we stochastically generated 10,000 mortality improvement rate scenarios by attained-age group across the projection horizon. We then randomly selected a single scenario from these 10,000 scenarios for application in a single stochastic projection iteration of the portfolio.

STOCHASTIC CATASTROPHIC MORTALITY VARIABLE

Unlike the property/casualty sector, we are concerned only about catastrophes that result in significant loss of life. Natural disasters were less impactful than pandemics and other disasters, which have the potential for loss of life in far greater numbers. Our model includes a stochastic variable representing additional lives lost in a given calendar year from three types of disasters: pandemics, earthquakes and terrorist attacks. From third-party data sources, we developed frequency and severity distributions for each of these three types of disasters and randomly sampled these distributions for each projection year (Figure 4).

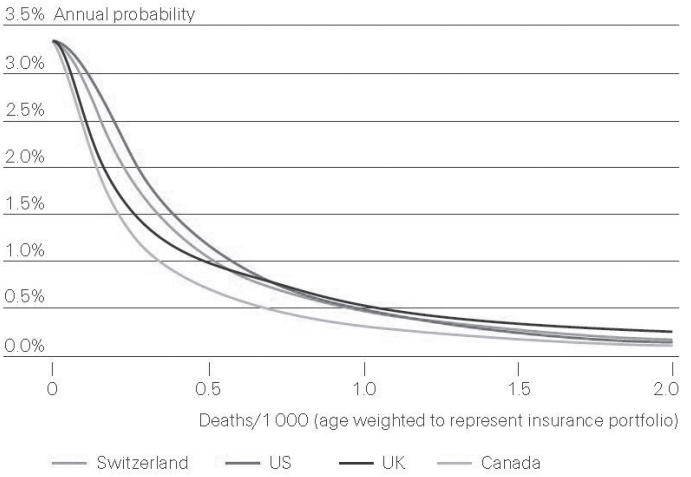
Figure 3
U.S. Population Mortality Improvement, Male 45-49



Mortality among males age 45-49 improved noticeably 1970-1982, but since has flattened out.

For each projection year, we randomly sampled the additional catastrophic mortality rate that was then added to the base mortality of each individual life. Having identified our approach and variables, we can now apply the stochastic process and analyze results.

Figure 4
Frequency and Severity of Pandemics



The graph shows the annual probability that an influenza pandemic will cause mortality greater than the X-axis values shown. (*Influenza pandemics: Time for a reality check?* Swiss Re, March 2007.)

DEATH BENEFIT COMPUTATION VIA BERNOULLI PROCESSING

In our model, we use a Bernoulli process to randomly decrement (via death or lapse) each life in the portfolio. To achieve this, we first stochastically generate base mortality rates, mortality improvement factors and catastrophic mortality rates. These stochastically generated rates we then combine into a composite set of projection year mortality rates for each insured life. Along with the deterministic lapse rates, these stochastically generated composite mortality rates are applied using a Bernoulli process.

A simplified explanation of our Bernoulli policy decrement process begins by sampling a uniformly distributed random variable for each insured life. These sampled random variables are then compared against the previously determined composite mortality rates for a given projection year as described in the following "if-then" process:

- If the random variable is less than the composite mortality rate, then a death results in the given projection year.
- Otherwise, the life survives and we generate a second uniformly distributed random variable. If this sampled value is less than the deterministic lapse rate, then a policy lapse occurs in the given projection year.
- Otherwise, the policy remains in force and continues into the next projection year where we repeat the process.

ANALYSIS OF MODEL RESULTS

After the model generates an adequate number of iterations—typically 10,000 or more depending on the portfolio size and modeling objective—we then validate and analyze model results. One of the first steps is to validate the output against other modeling sources and conduct a high-level evaluation of results given the model's input assumptions. After the model has passed these initial validations, we then conduct sensitivity analyses to further validate the model and to better understand how changes in input assumptions affect model results. Once the model is satisfactorily validated, we can then evaluate various value at risk (VaRs), and conditional tail expectation (CTE) measures.

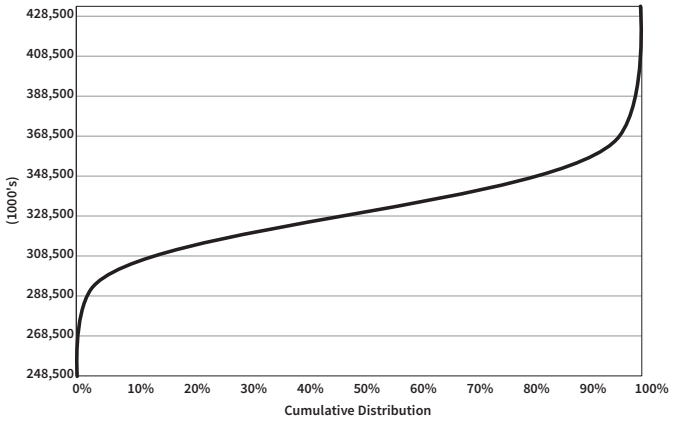
Model validation and sensitivity analysis. Some stochastic model validation criteria can be obtained from corresponding deterministic modeling results. For example, the average stochastic results of a given stochastic variable can often be validated against the corresponding best estimate result of a deterministic model. If the stochastic mean differs from the deterministic best estimate, this may raise a red flag. If the model is newly constructed, we should activate stochastic variables individually to assess their impact as they flow through the model. When considering the effect of catastrophes in our stochastic model, the resulting overall mean mortality rate should increase by the summed products of the respective frequencies and severities of each catastrophe variable. Numerous additional validation exercises can also be a part of the modeling process, including validation of interim calculations.

Once we have determined that the model is producing results in line with the input assumptions and other validation criteria, further sensitivity testing of model parameters can add value to the current project and enhance understanding of the model for future uses.

Cumulative distribution of results. Once we constructed our model we ran 10,000 simulations. Each simulation produced a net present value (NPV) of death benefits that we collectively ordered from lowest to highest. We graphed these ordered y-axis values with corresponding x-axis values set equal to the ordered rank divided by 10,000, producing values from 0 to 100 percent as shown in Figure 5. We then used the resulting cumulative distribution of NPV of death benefits to evaluate suitable measures for this variable.

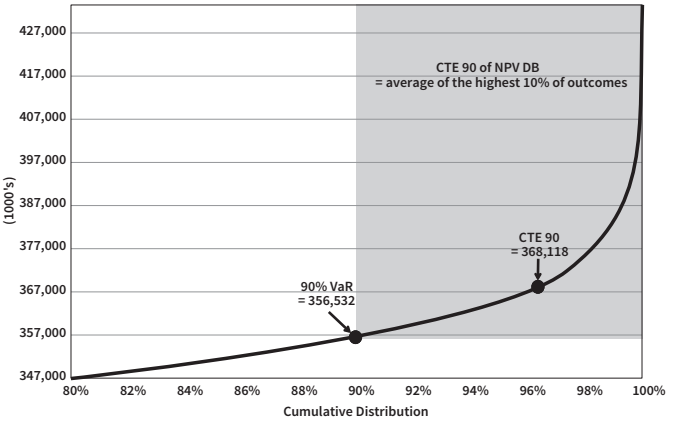
VaR and CTE. Two well-utilized measures obtained from stochastically generated cumulative distributions are the VaR and CTE. Each of these measures has its own strengths and weaknesses, but both can be easily ascertained once a modeler has produced an adequate number of stochastic iterations.

Figure 5
Distribution of NPV of Death Benefits



The 10,000 stochastic simulations yielded a fairly smooth cumulative distribution of net present value of death benefits.

Figure 6
Tail Distribution of NPV of Death Benefits



For clarification of the two measures, the above graph shows the CTE and VaR each evaluated at $\alpha = 90$.

VaR is specified with a confidence level α (typically α is selected $\geq 95\%$) and is the point on the cumulative distribution curve at $x = \alpha$. Generally, α-VaR is defined as the loss amount that will not be exceeded with probability α. For example, maintaining capital at a 99.5% VaR on next year's projected cash flows should sustain all but a 1-in-200-year scenario, or a 0.5 percent risk of insolvency. Note that some call this particular scenario tail a 1-in-200-year *event*; however, the tail may contain the culmination of different compounded *events* in the Monte Carlo process. VaR is typically measured over short time periods—for example, Solvency II incorporates a 99.5% VaR over a one-year period.

While VaR is a useful measure, we often want to know more about potential tail losses. For example, what is the expected size of a tail loss? The answer to this question is CTE α, which measures the expected loss given that the loss falls within the $(1- \alpha)$ quantile tail. For example, CTE 90 is the average of the worst 10 percent of modeled outcomes—which is easily calculated from the cumulative distribution.

Figure 6 shows the tail of our cumulative distribution of NPV of death benefits, along with illustrative CTE 90 and 90% VaR points on the curve. The plotted values in the blue shaded area each equally contribute to the CTE 90 calculation of $368 million in NPV of death benefits. In contrast, the 90% VaR of $357 million is the point in which only 10 percent of simulated NPVs exceed.

CTE measures may be more sensitive to severe low-frequency loss scenarios, whereas VaR measures may stop short of recognizing such rare loss events. However, even though the CTE may include extreme losses, their impact upon the CTE measure may be significantly tempered by the remaining tail. Furthermore, any comparison between CTE and VaR measures, and their sensitivities to rare events, will invariably depend on their respective quantiles (i.e., CTE 90 vs. 99.5% VaR).

CONCLUSION

Whether due to external requirements (i.e., principle-based approach (PBA), Solvency II) or internal needs, the importance of stochastic modeling is growing in the life insurance industry. Models should be built using an approach that will result in the most realistic simulation, incorporating the critical variables that affect the solvency of a block of business.

The basic model we described is only one of many possible designs that actuaries could use to stochastically model mortality and lapsation. While we did not touch on the increasing availability of stochastic modeling software, we covered some fundamental aspects that can be modeled independently of commercial applications. More importantly, our intention was to share a high-level illustration of some basic modeling components and how they can be assembled into a practical solution. ■

ENDNOTES

1 See "Lapse Rates in a Principles-Based World," *The Messenger*, June 2007.

2 "Credibility Analysis for Mortality Experience Studies—Part 1," *The Messenger,* March 2008

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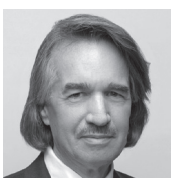

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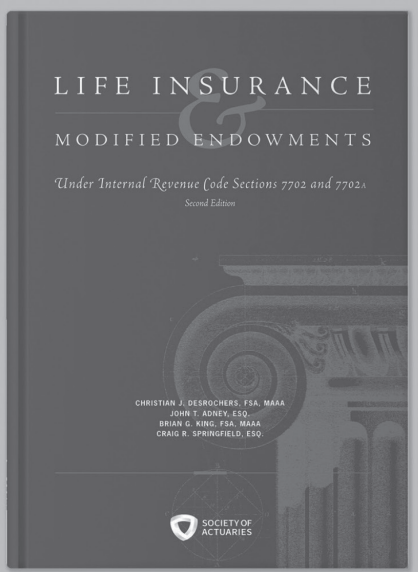

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Drivers of the UL/IUL Market: Regulatory Changes, Living Benefits and Low Interest Rates

By Susan J. Saip

Universal life (UL) products continue to be an important part of the individual life insurance market, despite the slight decline recently in the total life insurance market share (based on annualized premium). Over the past several years, sales of indexed UL (IUL) generally and of UL/IUL products with living benefit riders have driven total UL/IUL sales growth. The UL/IUL market share (measured by annualized premium) of total individual life sales was 37 percent[1] as of March 31, 2016. The IUL share of UL annualized premium had grown to 56 percent of total UL/IUL sales in the first quarter of 2016.[2]

Milliman's ninth annual survey of leading UL/IUL insurers revealed industry information relative to the issues and challenges of these products. For purposes of the survey, sales were defined as the sum of recurring premiums plus 10 percent of single premiums. The scope of the Milliman survey included UL with secondary guarantees (ULSG), cash accumulation UL (AccumUL), current assumption UL (CAUL), and the IUL counterparts of these products. The definition of these product types is shown below.

UL/IUL with secondary guarantees. A UL/IUL product designed specifically for the death benefit guarantee market that features long-term no-lapse guarantees (guaranteed to last until at least age 90) either through a rider or as a part of the base policy.

Cash accumulation UL/IUL. A UL/IUL product designed specifically for the accumulation-oriented market where cash accumulation and efficient distribution are the primary concerns of the buyer. Within this category are products that allow for high-early-cash-value accumulation, typically through the election of an accelerated cash value rider.

Current assumption UL/IUL. A UL/IUL product designed to offer the lowest-cost death benefit coverage without death benefit guarantees. Within this category are products sometimes referred to as "dollar-solve" or "term alternative."

A new high of 35 carriers submitted responses to t he survey relative to their UL/IUL products. The key findings of the survey are summarized in this article.

UL SALES

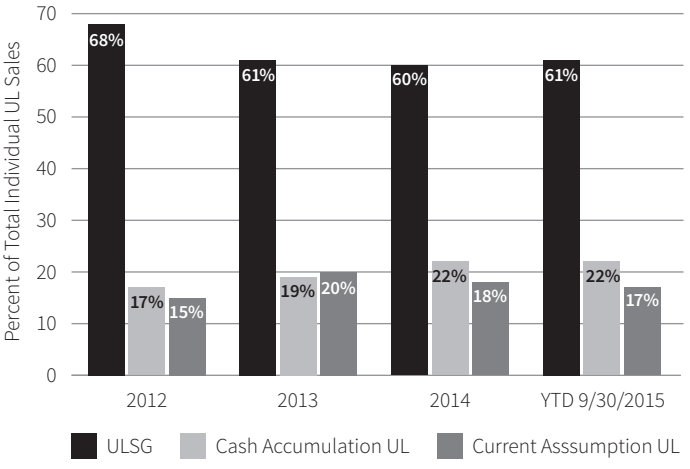
The mix of UL sales (excluding IUL sales) reported by survey participants for calendar years 2012 through 2014, and for 2015 as of Sept. 30, 2015 (YTD 9/30/15), is shown in Figure 1. Individual company UL sales results were varied, but 11 participants reported at least a 10 percent shift from or to any one UL product when looking at the YTD 9/30/15 product mix relative to that of 2012. Five of the 11 participants reported movement to CAUL products, two to AccumUL products only, another two to both AccumUL and CAUL products, and the remaining two to ULSG products. Four participants discontinued sales of ULSG products; one discontinued AccumUL products; and another discontinued CAUL products. Two participants began selling AccumUL products.

New to the survey was the reporting of sales by 7702 option and death benefit option for calendar year 2014 and YTD 9/30/15. For both periods, about 70 percent of total individual UL sales used the cash value accumulation test (CVAT) and about 30 percent used the guideline premium test (GPT). Virtually all ULSG sales were with death benefit option A for both CVAT and GPT designs. AccumUL had the highest percentage of sales for death benefit option B, for both CVAT and GPT policies. However, this allocation was higher for GPT designs versus CVAT designs, measured both by premiums and face amount.

INDEXED UL SALES

For survey participants, IUL sales during YTD 9/30/15 accounted for 51 percent of total UL/IUL sales combined during YTD 9/30/15, increasing from 37 percent in 2012. AccumIUL sales increased from 71 percent to 81 percent of

Figure 1
UL Product Mix by Year



total cash accumulation UL/IUL sales. IULSG and CAIUL sales, as a percent of total combined sales, decreased over this period. IUL products continue to be an attractive option in the recent low interest rate environment due to policyholders' interest in the upside potential and downside protection offered by these products.

Similar to responses in the past, overall survey statistics suggest that companies plan to focus more on cash accumulation IUL and current assumption IUL products and less on ULSG. The graph in Figure 2 illustrates the IUL product mix and the significance of AccumIUL products within the IUL market.

LIVING BENEFIT RIDER SALES

In recent years, triggers for accelerated death benefits (ADBs) on individual life insurance policies have been expanded from terminal illness to chronic illness and long-term care (LTC). Under chronic illness riders, payment of the death benefit may be accelerated if the insured has a chronic illness condition. Requirements to trigger the benefit typically utilize a combination of activities of daily living (ADLs) and cognitive impairment, or permanent nursing home confinement. For LTC accelerated benefit riders, payment of the death benefit is accelerated if the insured has a chronic illness condition (i.e., ADLs or cognitive impairment) triggering LTC.

Three common approaches are used for the payment of chronic illness ADBs. Under the discounted death benefit approach, the insurer pays the owner a discounted percentage of the face amount reduction, with the face amount reduction occurring at the same time as the accelerated benefit payment. This approach avoids the need for charges up front or other premium requirements for the rider, because the insurer covers its costs of early payment of the death benefit via a discount factor. Eight of the 15 participants that reported UL/IUL sales with chronic illness riders provided a discounted death benefit as an accelerated benefit.

Another three participants reported their chronic illness riders used a lien against the death benefit to provide the accelerated benefit, and two survey participants used a dollar-for-dollar death benefit reduction approach. The final two participants used both the lien approach and dollar-for-dollar death benefit reduction approach. Under the lien approach, the payment of ADBs is considered a lien or offset against the death benefit. Access to the cash value (CV) is restricted to any excess of the CV over the sum of the lien and any other outstanding policy loans. Future premiums/charges for the coverage are unaffected, and the gross policy values continue to grow as if the lien didn't exist. In most cases there are lien interest charges that are assessed under this design.

Under the dollar-for-dollar approach, there is a dollar-for-dollar reduction in the specified amount or face amount and a pro rata reduction in the CV based on the percentage of the specified amount or face amount that was accelerated. This approach always requires an explicit charge.

During the first nine months of 2015 sales of policies with chronic illness riders as a percent of total sales were 23 percent for UL products and 41 percent for IUL products, at or near peak levels. A greater share of chronic illness riders was seen on an IUL chassis since more new IUL products have been developed recently, and many of these included a chronic illness rider. YTD 9/30/15 sales with chronic illness riders as a percent of

Figure 2
IUL Product Mix by Year

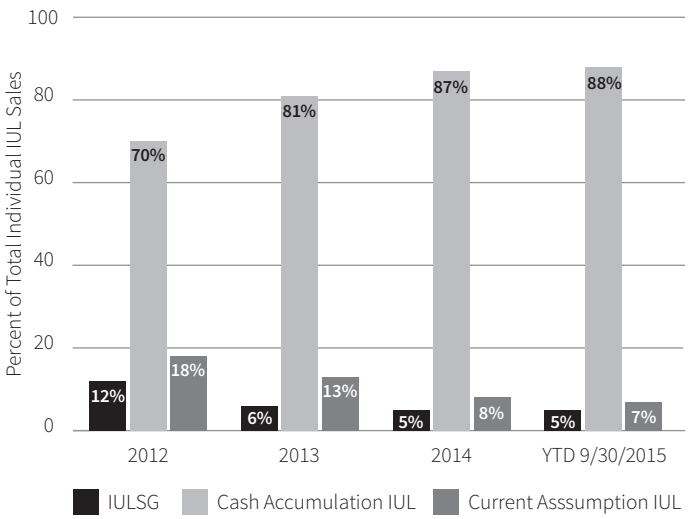


Figure 3
Chronic Illness Rider Sales as a Percentage of Total Sales

Ytd 9/30/15 UL Sales With Chronic Illness Riders As A Percent Of Total UL Sales (Weighted By Premium)			
Total Individual UL	ULSG	Cash Accumulation UL	Current Assumption UL
23%	24%	33%	9%
Ytd 9/30/15 IUL Sales With Chronic Illness Riders As A Percent Of Total IUL Sales (Weighted By Premium)			
Total Individual IUL	IULSG	Cash Accumulation IUL	Current Assumption IUL
41%	28%	41%	51%

total sales for UL and IUL products separately by product type are shown in the table in Figure 3.

Recently attention has been drawn to LTC needs due to the high cost of medical care and the aging population. An alternative solution to stand-alone LTC policies for LTC needs is the use of LTC riders attached to life policies, particularly UL/IUL policies (linked benefits). In the last three to four years there has been a shift away from single premium business to limited pay business. Thus, sales results by first-year premium are somewhat misleading. Despite this shift, during YTD 9/30/15, sales of policies with LTC riders as a percent of total sales were 19 percent for UL products and 9 percent for IUL products, both at peak levels. Figure 4 shows sales of LTC riders as a percent of total sales reported by survey participants for UL and IUL products separately by product type.

Few companies in the UL/IUL market offered both chronic illness riders and LTC riders; only three of the survey participants offered both chronic illness and LTC accelerated benefit riders. Nearly 83 percent of survey respondents expect to market either an LTC or a chronic illness rider within the next 24 months.

PROFIT MEASURES

Consistent with past survey responses, an after-tax, after-capital statutory return on investment/internal rate of return (ROI/IRR) was the predominant profit measure reported by survey participants. The median ROI/IRR was 10 percent for all UL products and IULSG, and was 12 percent for AccumIUL and CAIUL.

Actual results relative to profit goals were reported by survey respondents for 2014 and YTD 9/30/15. In 2014, 68 percent of ULSG participants reported they fell short of profit goals. For the remaining UL/IUL products, 69 percent of participants were at least meeting their profit goals. For YTD 9/30/15, 61 percent were short of their profit goals for ULSG, and 73 percent of participants were at least meeting their profit goals for all other UL/IUL products. The chart in Figure 5 shows the percentage of survey participants reporting they fell short of, met, or exceeded their profit goals by UL product type. Low interest earnings and expenses continued to be the top two reasons given for failure to meet profit goals.

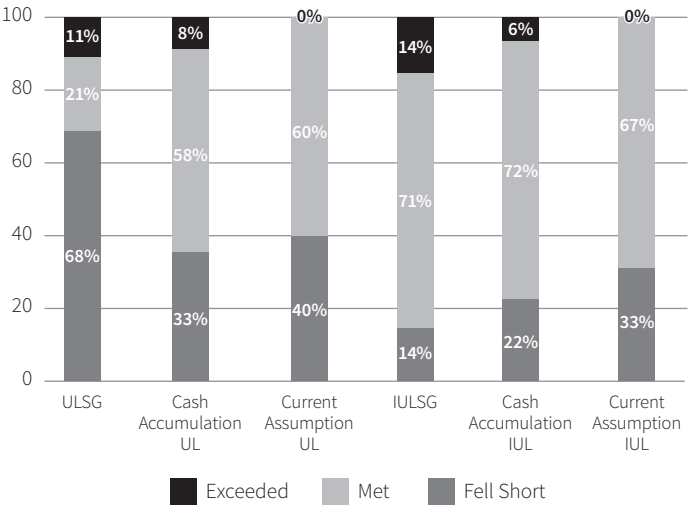
Figure 4
LTC Rider Sales as a Percentage of Total Sales

Ytd 9/30/15 UL Sales With LTC Riders As A Percent Of Total UL Sales (Weighted By Premium)			
Total Individual UL	ULSG	Cash Accumulation UL	Current Assumption UL
19%	30%	6%	< 1%
Ytd 9/30/15 IUL Sales With LTC Riders As A Percent Of Total IUL Sales (Weighted By Premium)			
Total Individual IUL	IULSG	Cash Accumulation IUL	Current Assumption IUL
9%	14%	9%	15%

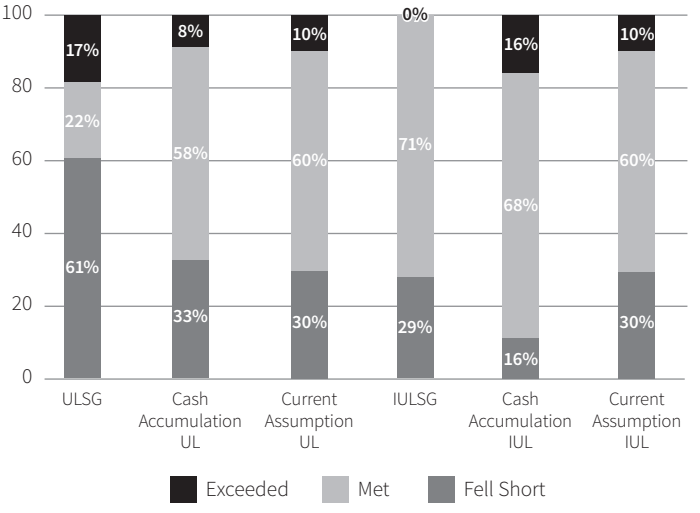
PRINCIPLE-BASED RESERVES

Principle-based reserves (PBR) will be effective Jan. 1, 2017, and nine survey participants reported they anticipate implementing PBR immediately. Nineteen expect phasing in the implementation of PBR over the three-year phase-in period allowed. Factors impacting the rationale for participants' implementation plans include resource issues, the impact on reserves and capital,

Figure 5
Actual Results Relative to Profit Goals



Actual YTD 9/30/15 Results Relative to Profit Goals



the need for preparation and research, and competitive reasons. Fifteen participants do not know what approach they will use for pricing new UL/IUL products in a PBR environment for products that require one of the VM-20 reserve components (VM-20 includes valuation manual minimum requirements for PBR for life insurance products). For the remaining participants, various responses were received including no changes to the reserve approach they currently use in pricing, reflecting VM-20 reserves in pricing, using a reduced subset of stochastic scenarios in pricing, and using approaches that estimate additional reserves.

ILLUSTRATIONS

The percentage of participants reporting that they are no longer illustrating non-guaranteed elements on ULSG products was 43 percent, down from 48 percent reported last year.

Eighteen of the 22 IUL participants reported the rate that was calculated for the Benchmark Index Account per Section 4A of Actuarial Guideline 49 (AG 49). The average rate was 6.72 percent and the median was 6.87 percent. Eight participants reported the rate for the hypothetical Benchmark Index Account, with an average of 6.99 percent and median of 7.05 percent.

Twenty of 22 survey participants reported that the illustrated rate used in IUL illustrations decreased relative to the illustrated rate of one year ago. The median illustrated rate was 6.70 percent and the average was 6.59 percent. This compares with the median illustrated rate one year ago of 7.50 percent, and an average of 7.10 percent. The majority of IUL participants (19) reported they had made adjustments to illustrations based on AG 49, but few participants had made changes to their product designs because of AG 49.

Survey participants reported whether they were currently testing in-force business or using Actuarial Standard of Practice (ASOP) 24 Section 3.7 to not test when certifying for illustration actuary testing on in-force business. ASOP 24 Section 3.7 applies to illustrations on policies in force one year or more. Thirteen of 34 participants reported they were currently using ASOP 24 Section 3.7 to not test when certifying for illustration actuary testing. Eleven participants were testing in-force business, and six were using both approaches.

The majority (27 of 35) of participants were doing sensitivity testing to see where the disciplined current scale (DCS) breakpoints are (i.e., when the DCS might fail).

Three participants reported they were illustrating utilization scenarios/examples for ADB riders with a discounted death benefit approach. One of the three, plus four additional participants were illustrating utilization scenarios/examples for other ADB riders. The majority of participants that were illustrating ADB utilization reported that the illustrations were in a supplemental illustration, rather than in the basic illustration.

CONCLUSION

Many trends in the UL/IUL market arise as a response to challenges presented by regulatory actions, economic issues and even health/aging issues. In recent years, this has included secondary guarantee issues, IUL popularity, and the development of living benefit riders. Who knows what the next bump in the road will be and what direction the UL/IUL market will take? It's important to follow industry trends, address challenges, and also take advantage of opportunities in order to stay competitive in the UL/IUL market.

A complimentary copy of the executive summary of the June 2016 Universal Life and Indexed Universal Life Issues report may be found at: *http://www.milliman.com/insight/2016/Universal-life-and-indexed-universal-life-issues--2015-survey/*. ■

ENDNOTES

1 LIMRA International, Inc.

2 Ibid.

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Underwriting Juveniles for Large Cases: The Issue Grows More Complex

By Kristin Ringland

EXECUTIVE SUMMARY

Life insurance for juveniles has been a fairly simple proposition. Most insurers offer a Juvenile Coverage rider to a parent's policy for a nominal face amount and charge. Others offer stand-alone low-face whole life policies. Coverage traditionally has been for final expense (the rider) or as a primer for the child's savings (whole life).

But the market is growing more complicated, with parents or grandparents now seeking multimillion-dollar policies for their (grand)children. How are companies responding, especially in light of increased consumer (and producer) demand, and what are the risks?

The author outlines some considerations.

Many companies offer low amounts of coverage for minors through a rider attached to an adult policy or a stand-alone whole life policy. A growing trend we have witnessed through discussions with clients and in our own facultative shop is an increase in high-face applications on children. While still infrequent, we are beginning to see applications for $5 million, $10 million or even more. This business is small relative to total volume but the trend does raise some questions.

TIMES HAVE CHANGED

Life insurance for minors traditionally is sold to provide final expense coverage for an unanticipated death or to help create a nest egg for the child to use in early adulthood. Often the savings element in whole life policies is marketed as a tool to help finance college education. But the product design has not kept up with the times: with annual expenses at many colleges reaching up to $100,000, the cash/surrender value of a $150,000 whole life policy may not cover the first-year tuition and expenses.

We reviewed some recent policy illustrations to examine cash values at age 18 (Figure 1):

- About $80,000 on a $500,000 15-pay whole life policy for a 3-year-old girl

- About $115,000 on a $1 million 10-pay whole life policy for a 5-year-old boy

Based on the illustrations, the cash value $500,000 policy likely would fall short of completely financing a traditional, four-year college education today, whereas the $1 million coverage could provide sufficient funds for all but the most selective universities.

Other factors certainly play a role in the trend, however:

Gifting. The IRS allows an individual to gift assets up to $14,000 ($28,000 for a couple) to another person without causing a taxable event. The gifting of premium into a secure, large risk/savings instrument can be attractive, especially compared to other savings vehicles.

For the high-income segment who may have maximized their own tax-favored vehicles (jumbo life coverage, maximum contributions to 401(k) and other retirement vehicle savings, etc.),

Figure 1
A Comparison of Two Whole Life Policies

Characteristics Insured	Policy A 3-year-old girl	Policy B 5-year-old boy
Policy	15-pay whole life	10-pay whole life
Initial Face Amount	$500,000	$974,219
Annual Premium	$3,600	$12,000
Paid Up at Age...	17	18
Cash Value, Age 18	$72,986	$116,312
Face Amount, Age 18	~ $1 million	~ $1.2 million

The illustrated policies assume dividends finance paid up additions, hence the increase in death benefits. Case values represent guaranteed values.

such policies on their children may be an attractive wealth transfer option.

Tax benefits. The cash and surrender values of whole life insurance have numerous tax advantages over many investment alternatives. Policy loans trigger no tax event as long as the loan is repaid. And of course death benefits pass to beneficiaries tax-free.

Guaranteed insurability. Permanent products allow the parents to lock in a child's insurability based on current health status. In addition, many policies, such as those in Figure 1, are paid up at age 18 to maximize the gifting/benefit balance.

International dollar business. Customers from overseas value the security of a hard-currency-denominated instrument issued by a highly rated life insurer. In Canada we see more clients from Asia purchasing permanent policies with CA$5 million or more in face amount. Similar trends exist in the United States, especially with wealthy clients from Latin America.

Carrier participation. Demand cannot be met without supply, and some life insurers have signaled at least some willingness to offer high-face policies on minors.

CHALLENGES ARISE

With the exception of infants, we expect children to exhibit favorable mortality. In theory then, high-face, high-premium life insurance policies on minors may be a profitable business. However, some issues persist.

Insurance experience. As an industry, we do not have adequate experience to underwrite or price such products accurately. Our previous product offering has been very low face amount with a very conservative premium rate. Large cases are new territory for many companies.

Adult vs. juvenile underwriting. Most large-face policies are designed to be fully underwritten on adult applicants. An insurer is unlikely to require blood, urine, attending physician statement (APS), rest/stress EKGs, etc. from a child. In any case such test results likely would not be too informative: NTPro-BNP is likely not a relevant risk marker for a fifth grader.

Causes of death. Children and adults die from different causes. Death from age 5 to 25 is primarily driven by accidents (*http://www.nlm.nih.gov/medlineplus/ency/article/001915.htm*). According to the National Institutes of Health (NIH), death rates among U.S. children fall significantly after infancy, and rise around age 15 from accidents, suicide and homicide.

Note that NIH data is population-based, and data from other countries may not be as readily available or credible for International Dollar Business.

Definition of insurance. A key consideration in the definition of insurance is insurable interest. If a policy fails the insurable interest test, is it in fact "insurance"? Risk transfer remains the defining test in distinguishing between life insurance and an endowment.

CARRIER RESPONSE

We recently conducted an informal poll of client chief underwriters on this subject. The consensus is that companies are seeing more of such cases and the trend is raising interest and concern.

However, approaches vary, from retaining the traditional approach (perhaps raising the coverage limits to reflect today's education costs) to being fairly comfortable with writing higher-face policies on minors. Some companies will not consider such coverage unless the applicant's parent(s) are covered with the company; others appear willing to issue policies without this prerequisite. Some insurers may limit coverage amounts as a percent of the parent's in-force. Other carriers may match the parent's face amount dollar for dollar.

REINSURER INVOLVEMENT

SCOR Global Life Americas continues to monitor this development and assess the trend's implications for the industry. If your company is seeing an increase in such application activity, please feel free to contact any of SCOR's underwriters for consultation. ■

Kristin Ringland, FALU, FLMI, ACS, is vice president and chief underwriting officer at SCOR Global Life Americas. She can be reached at *kringland@scor.com*.

System Peer Review: A Missing Link in the Evolution of Actuarial Modeling

By Mike Failor

As the industry continues to progress from a formula-based to a principle-based approach to capital and reserves, companies and their actuaries face mounting challenges to keep pace. Dynamic systems that support stochastic modeling will become requisite tools, and making any modifications to these systems will require a robust set of internal controls. This article considers the importance of the system peer review within the auspices of the larger system change control process and provides clients with suggestions for creating more robust controls.

Figure 1
The State of Modeling Controls

Modeling Governance Theme	Score	Current State Synopsis
Governance Standards	3	While many companies employ a variety of model governance policies, few companies have a holistic, formal and documented model governance structure.
General Modeling Process	3	Many companies have multiple models and modeling platforms and few companies incorporate a model steward role in the modeling processes.
System Access and Change Control	**4**	**Model changes are not generally governed by a formal change process.**
Model Assumption Management	3	Assumptions are regularly reviewed and updated, but with few controls in place to ensure assumptions are approved and input appropriately.
Model Input Management	2	Many companies use automated feeds from admin systems for model inputs of liabilities. Other model inputs are often less automated.
Model Output Management	2	Model output used for financial reporting purposes is generally well controlled, while model output for analysis and other purposes is generally less controlled.

Peer review of coding changes falls under the governance theme of System Access and Change Control. This category rated the worst of all governance themes. (Source: "Actuarial Modeling Controls: A Survey of Actuarial Modeling Controls in the Context of Model-Based Valuation Framework." SOA, December 2012)

OVERVIEW

Over the past decade, the desire for open-code modeling systems and home-grown actuarial modeling software has guided the evolution of third-party systems and software application tools. Many of these systems provide a clean slate for flexible model development and creativity, allowing the models to be tailored to specific company needs. But such in-house development efforts also raise the possibility of system error. While this remains an ongoing risk, it should be understood that proper system controls are needed to help reduce this risk. A recent Society of Actuaries (SOA) survey indicates that adequate system change controls appear to be a missing link in actuarial modeling evolution.

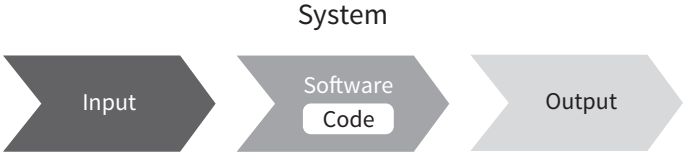
IS THE INDUSTRY READY FOR THE NEXT EVOLUTIONARY STEP IN ACTUARIAL MODELING?

Back in December 2012, the Society of Actuaries (SOA) published "Actuarial Modeling Controls: A Survey of Actuarial Modeling Controls in the Context of a Model-Based Valuation Framework." The intent of this research survey was to compare the current state of industry modeling controls against those expected to be in place for model-based valuation (MBV) approaches. Deloitte Consulting analyzed the survey results and appraised existing control gaps that need to be addressed. (Note that this survey has been recently updated and is expected to be published in late 2016).

The report rated six governance themes on a scale from 1 to 5 (1 being the best, 5 the worst). And, not surprisingly, the category receiving the worst score of 4 was System Access and Change Control (Figure 1). This reflects the need for improved system change control processes when system code is modified.

This low grade should not come as a complete surprise. Consider that actuaries historically have focused more on checking modeling input and validating modeling output. In fact, these two areas are the focus of most model peer reviews. In contrast, system peer reviews should include a direct evaluation of the code (Figure 2). This situation may reveal a mindset that coding errors will manifest themselves in the output where they can be easily identified. While output evaluation is certainly expected,

Figure 2
Model and System Peer Reviews



Actuaries typically focus on inputs and outputs during a model peer review. A system peer review directly examines the appropriateness and effectiveness of the underlying code, supporting system parameters and documentation.

many coding errors may remain undetected and buried without an adequate evaluation of the coding changes.

In the world of software development, it is well recognized that code analysis helps to root out logic and calculation errors that may otherwise go undetected when evaluating only system inputs and outputs. If industry best practices are the goal, in-house code changes may require a more thorough treatment in the system control process. Software vendors already institute these best practices. Carriers that either modify open-code systems or create in-house applications should implement their own formal system change controls.

INHERITANCE OF SYSTEM CONTROL TRAITS

Code management and corresponding system change controls require a high level of due diligence that is currently a trait of the software vendors. When software vendors modify the code in their maintained systems, they follow a robust change control process. Without such control processes, their software would quickly get out of hand and result in potentially disastrous error levels. No vendor has perfect code, but third-party software providers know the value of a formal control process.

The robust system control traits of the software vendor should be passed down to those who continue to modify their system code. Carriers will benefit from similar control processes when they modify their modeling software. Proper consideration and care should be reflected in the company's system change controls to assure that their modeling applications remain accurate and viable. One important feature of any system control process is the system peer review.

PEER REVIEW OBJECTIVES

As system complexity increases, so does the risk of system errors. Consider also that system errors, by their very nature, can be "systemic" in their effect as they may impact each model that is built on the affected platform. It may not be possible to identify and remedy all weaknesses before a system change goes into production, but peer reviews help identify errors that otherwise may go undetected.

A system peer review should attempt to identify:

- **Technical errors.** Does the coding have any mistakes (logic loops, wrong formulas, etc.)?
- **Consistency.** Does the code reflect the desired options and feature specifications?
- **Technical documentation.** Are requirements for user documentation and tutorials satisfied?
- **Assumptions.** Does the system accommodate the full range of required modeling assumptions?
- **List of features.** Is it up-to-date?

Note that an important step in a system peer review is the assurance that the system is properly documented. Also, the peer review process itself should be well-documented. As the system continues to be modified and evolves over time, system change requests should be managed and documented to reflect the purpose and specifics of each modification. Whether the changes are due to error corrections or added features/functionality, documentation should accompany each modification. Maintaining a well-documented version history aids in the reconciliation of modeling results among different system versions.

THE REVIEW TEAM

Not all actuaries are expert programmers, and the inverse is also true. Thus, it is highly desirable for the peer reviewer to be an amalgam of the two—an actuarial developer. This person may be hard to find, especially when considering the required knowledge of the products and features that the system supports.

The ideal system peer review team should include both programmers and actuaries. Additionally, it is called *peer* review for a reason. Teams should include seasoned experts at the same level as those initiating and implementing the system change. To ensure the most candid and unbiased assessments, reviewers should be selected from outside of the designers' reporting hierarchy. In some cases it may be recommendable to engage an outside consultant to participate in the review.

IMPLICATIONS FOR THE NEAR FUTURE

Formal system peer reviews may currently be treated as a luxury, but that status may not last long. The introduction of VM-20 raises the bar for system change controls. A formal peer review process—not only of models, but also of underlying systems—should become standard practice. Companies employing a robust formal system peer review process will have a competitive advantage over many companies that have yet to identify this missing link in modeling evolution. ■

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Highlights of Sessions at the 2016 SOA Life & Annuity Symposium

By Kurt A. Guske

This article contains a summary of some of the presentations given at the 2016 Society of Actuaries (SOA) Life & Annuity Symposium in Nashville. While this article covers only a portion of sessions that are related to product development, it shares observations that have been made by various members of the SOA Product Development Section Council. We encourage everyone to join our LinkedIn group where you can participate in discussions on these or any other topics that are relevant to our business. If you would like to present at an upcoming SOA event or write an article for Product Matters!, *please contact Simpa Baiye at* simpa.baiye@pwc.com, *Brock Robbins at* brobbins@scor.com, *or me at* kurt.guske@aig.com.

SESSION 54 WORKSHOP: ILLUSTRATION WORKSHOP FOR AG 49

Presenters: Brandon Patrick Emerson, FSA, CERA, MAAA; Laura Alden Hanson, ASA, MAAA; Francis L. Radnoti, FSA, MAAA

Slides available at *https://www.soa.org/Files/Pd/2016/las/pd-2016-05-las-session-54.pdf*

By Francis Radnoti

Based on polling results, the audience was predominantly made up of insurance company actuaries who did not function as illustration actuaries, but rather characterized themselves as possessing only a high-level understanding of Actuarial Guideline 49 (AG 49). While there were still several subject matter experts in the room, there was greater attendance than we expected from people less familiar with the subject. There were several people who had to use actuarial judgment under AG 49, either in the creation of a Benchmark Index Account, or in the determination of illustrated rates for other accounts. People represented different thoughtful approaches used and agreed on the need for strong documentation.

With respect to the 145 percent limit in Section 5, some viewed this as a direct limit to the illustrated rate, while some viewed this as an indirect limit that is considered only in disciplined current scale (DCS) testing. With respect to the illustration of bonuses, there was roughly an equal split of people who would or would not illustrate a bonus above the maximum illustrated rate if it passed DCS testing. In order to comply with the 100 bps loan limit, the vast majority of respondents would decrease an illustrated crediting rate, rather than use an alternative approach.

The group was fairly evenly divided as to whether AG 49 limitations should be applied to in-force illustrations.

SESSION 66: TRENDS AND NEW TOOLS IN INSURANCE MARKETING AND DISTRIBUTION

Moderator: Andrew G. Steenman, FSA, MAAA; Presenter(s): Benjamin Filip and Jay M. Jaffe, FSA, MAAA

Slides available at *https://www.soa.org/Files/Pd/2016/las/pd-2016-05-las-session-66.pdf*

By Jay M. Jaffe

Editor note: This article provides detailed insights into Jay's part of the session. Happy reading.

Each year the magazine *Broker World* devotes its January issue to a "Carrier Forecasting Forum." This issue features short articles from 10 or more life and annuity company executives. Given the theme of the issue, I've always anxiously anticipated these articles with the hope that they would present a picture of the trends the chief marketing officers (CMOs) and other contributors expect in the near term.

The 2016 Carrier Forecasting Forum included articles from 13 companies. I went through these articles and have identified the common interests among the authors. So what did I find?

My general observation is that these industry leaders were more concerned about convincing the readers of *Broker World* that their companies are better than the other companies that authored articles for the issue. Their standard message was "sell for me in 2016." Any insight the authors have about trends in distribution channels and insurance marketing, for the most part, was not revealed in their articles.

Collectively, the CMOs mentioned several few general trends that I'm sure we all expect to happen:

- More use of social media activity
- Faster application processing
- Expanded mobile access for prospects and producers
- AG 49 will have an impact on the way new business is conducted.
- Data is becoming increasingly important and easier to obtain and use.
- Customer satisfaction needs to be measured and tracked.
- The continued low interest rate environment needs to be addressed.

A couple of the CMOs talked about identifying and expanding into new areas of growth such as women producers, Hispanic

and other ethnic markets. A few CMOs were concerned about creating an atmosphere or culture that would attract agents and customers.

There was one author who seemed to have a broader grasp of what agents need for future success. Interestingly, this individual was the head of a large independent marketing organization (IMO) rather than an insurance company employee. Here are a few of his comments that resonated with me:

- We're living in a new world. Forget how things were done in the past.
- The key task his organization faces is to "identify, engage, educate and enable the next person who can position and sell a life insurance policy."
- Creating and enabling new distribution
- Ensuring succession and continuity of production entities
- Dealing not only with change but the rapid pace of change

I had hoped that *Broker World* would have provided me with a long list of upcoming trends and distribution changes and simplify my preparation for this panel. Instead, I had to do my own thinking and make my own observations about the general trends and changes in the life insurance distribution process that we are likely to see in next several years. I identified eight areas that should be considered as potentially impacting life insurance distribution:

1. Shifting production sources
2. The sources for innovative ideas
3. The implications of using outside innovation sources
4. The opportunity for an insurance revolution
5. Insurance clones
6. A changing insurance regulatory environment
7. Direct-to-consumer
8. Private benefit exchanges (PBEs)

The Shift in Production Sources

Today's life insurance business is dominated by fewer and fewer carriers. There's every reason to expect that this trend will continue.

Nowadays very few life insurance companies hire and train raw life insurance agents. More and more IMOs are stepping up to fill this gap. To some extent the emergence of the IMOs is also a reflection of the concentration of product availability from fewer and fewer carriers.

The implication of the increasing dominance of the IMOs is that more than ever the fight between many insurers will be not for consumers but for production sources. The exceptions to this new reality will be a few carriers that have established a brand name and can deal directly with consumers without the need for an intermediary.

The implication of the increasing dominance of the IMOs is that more than ever the fight between many insurers will be not for consumers but for production sources.

I believe the trend toward stronger and more creative external production sources will continue. In the future some IMOs will work with individual independent producers while others will become more technology oriented. As is the case now, many IMOs will identify and operate in market niches.

The Sources for Innovative Ideas

My nonscientific but carefully observed impressions are that most new ideas for improvements in the life insurance delivery process are not emanating from within insurance carriers but from external sources. New underwriting tools, data-driven solutions, new technologies and other improvements strongly tend to originate from outside entrepreneurs rather than within carriers.

One of the reasons outsiders produce these new ideas is that insurance companies, with some exceptions, do not foster an atmosphere of creativity and research. It would be very unusual for an insurance company to have a research and development (R&D) budget because most company efforts are devoted to meeting yearly goals. Identifying new solutions can be expensive and then to get concepts to the point where they can be applied by insurance companies adds further expense. Besides, most new ideas fail so all the costs of the failed projects have to be amortized over the costs of the few projects that are successful.

The Implications of Using Outsiders for Innovative Ideas

The good news is that if new ideas are developed by outside entrepreneurial organizations, there will be more new ideas and probably at lower cost than if they are created within insurance companies. The bad news is that all carriers will begin to look alike because they are buying the same new innovations.

Most of the time, there will be just a few new entrants providing a new technology or concept. The insurance market is not large enough to have tens of providers offering versions of the same or a similar new idea. It should not be surprising that even the idea developers are likely to consolidate.

Looking ahead, there will be fewer unique insurance products. Also, insurers will quickly find that what they thought was a new idea will rapidly become ubiquitous rather than remain unique.

The Opportunity for an Insurance Revolution

The major question about the future we face is who or what will revolutionize the insurance business in the coming years.

For example, sooner or later Google, Amazon or another forward-thinking company will probably tackle not just the process we use to buy insurance, but also the concept of insurance as we know it today. These companies will offer an entirely new customer-centric experience. Some of these new ventures will concentrate on distribution, and others may target new types of risk takers and products. While we can't predict what the new insurance environment will look like, it is not difficult to expect that Google or another visionary company will be successful at reinventing the insurance business.

Tech companies have the talent to revolutionize the insurance business. They employ more than a sufficient number of those who hold doctorates and others to invent new products and ways to distribute insurance. Moreover, when they become successful entrants to the insurance business, they may not need or choose to rely on actuaries for insurance and analytic expertise.

Insurance Clones

One way to create needed new insurance products is to build them as insurance clones rather than as regulated insurance contracts. In recent years a number of products and services have been developed that are insurance clones but for regulatory purposes are not classified as insurance.

An example of an insurance clone product is a dental network rather than dental insurance. The network provides discounts for dental services versus payments for services. A dental network is definitely not an insurance product and, therefore, is more flexible and less expensive to develop and operate as well as providing benefits that are often more appropriate for consumers than those provided by similar insurance policies.

The Regulatory Environment

I foresee that the increasing complexity of the regulatory environment may result in a movement to both modernize and make the current regulatory environment more workable. For example, we already have the Interstate Insurance Product Regulation Commission (or the Compact) to make filings easier and less expensive.

A way to judge the success of the future regulatory environment is to see new, creative insurance companies being formed. We need these new carriers if we are to maintain a vibrant industry. Every environment must have a diverse gene pool if it is going to survive.

If there continues to be an absence of new carriers, we'll be continuing the trend of an industry that used to have relatively free entry but is currently devoid of new blood. Both the industry and insurance regulators need to find some way to encourage new insurance companies to be formed or face winding up with a situation where a few life insurance companies dominate the landscape. To some extent this is exactly what we see has happened to the health insurance industry.

Direct-to-Consumer (DTC)

During the past 60 or 70 years the DTC distribution system has undergone as much of a transformation as any insurance distribution system. It provides a good case study of adaptation and innovation in a changing world. To a large extent, DTC distribution is a precursor of future distribution trends.

DTC began mainly using print media. The most obvious example is direct mail, but it also used ads on public transportation, applications inside matchbooks, take-ones on counters, and other print media. Then a massive change occurred in the later part of the 20th century when telemarketing became popular and profitable. Telemarketing wasn't successful because of someone's brainy idea but rather because new tele-technology made calling easier and inexpensive.

More recently DTC has moved into internet-based marketing activities. The new internet tools enable marketers to reach potential customers with offers that are precisely targeted to the needs and desires of each prospect. The product offering can be made to appear to be a very personalized offer rather than an offer to a broad group of people.

There's no question that DTC will become a more important insurance distribution method. Some insurance marketer may even find a way to change the old adage that much "life insurance is sold not bought" to one where "life insurance is a proactive purchase." The point is that we're getting very close to having this capability.

Private Benefit Exchanges (PBEs)

A distribution platform related to DTC is the PBE platform. Recently, Accenture reported that for the recent 2016 enrollment period there was a 35 percent increase as compared to the prior year in respect to people purchasing health plans through an online market. While the absolute numbers of people and employers using the PBE marketplace are still not dominant in the market, the trend to more PBE participation is significant.

If PBEs become more popular, could this format become the answer to how to reach the middle market? Will PBEs replace worksite marketing and some other DTC activities? If I were the CMO of any insurance company interested in the middle market, I would at least be investigating, if not heavily investing, in distribution through the PBE system.

A consequence of not having a predominant place in the PBE networks will be that the non-players in this distribution system

will be shut out of certain individual markets. To avoid customer sensory overload PBEs will severely limit the number of carriers offering specific products. The PBE market may very well be a case where "the early bird gets the worm." As such, one should not expect many opportunities for late entrants.

Conclusion

Given that this session's topic has much to do with the future, you're probably now wondering whether I've left you with any nuggets of useful information and if the information I've presented is accurate. I cannot promise you that each and every observation or trend that I've mentioned will be helpful. Rather, my hope is that my comments should enable you to make your vision of the future more relevant.

Perhaps the best nugget I can leave you with is how to develop your own predictive skills. It is not difficult to be a successful forecaster if you first become an observer. The second step is to consider the implications of what you see and infer from your observations. You will not make perfect predictions, but don't let this fact stop you from thinking about how you and your companies need to change in order to be active and successful participants in the life insurance business in the next two to five years or beyond.

If you choose to be a trend predictor, you are likely to be viewed as successful even if your recommendations are only 25 percent accurate. There's no magic to the 25 percent success rate I've just mentioned. However, it is not an insignificant coincidence that the average major league baseball player only batted .254 in 2015. This means, on average, that the players failed to hit safely 3 out of every 4 times they came to bat. If you're a pessimist, you'll likely focus on the fact that each hitter failed 75 percent of the time they had a chance to help their teams with a hit. The average typical major leaguer is now paid over $4 million per year. Not bad for being successful only 25 percent of the time! ■

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