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SECTION**

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Product Matters!

Individual Annuity Sales and Product Trends

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Product Matters!

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Chairperson's Corner

By Jeremy Bill

I can remember it like it was yesterday. I was walking down the street in Toronto during the Life & Annuity Symposium in the spring of 2013. I was visiting with Tim Rozar about an upcoming actuarial event that I was organizing for my company, and Tim was graciously sharing his insights from a similar event he had organized for his company.

At the end of the conversation, Tim casually asked: "Have you ever thought about running for the Product Development Section Council?" I soon found out that Tim was the vice chair of the Product Development Section and that the council was working on filling the ballot for the upcoming election.

In all honesty, I had never really considered running for council membership prior to that point. I had done a little speaking at SOA meetings and had written a couple of articles, but I didn't really know much about the council or the work that it did. I asked Tim for more information and let him know that I would consider running if there was still a need for candidates.

I ultimately decided to put my name on the ballot, since it sounded like they were pretty desperate for candidates (why else would they ask me to run when I didn't really know much about the council?). When the ballot was released, I was surprised to see that there were six candidates on the ballot to fill the three open spots on the council for that term! As I reviewed the list of other candidates, I found that many of them were already very involved with the activities of the section and were already making some great contributions. At the time, I felt a little relieved: it looks like they've got some great candidates, so they won't be needing me!

Shortly after the elections, I got a call from the Society of Actuaries. I was surprised (if not shocked) to hear that I had been elected to a three-year term of the Product Development Section Council. I felt very honored to be elected. I also felt a certain weight of responsibility to do a good job and take my responsibilities on the council seriously.

Over the following months, I learned a lot about the activities of the SOA sections and the great work they do. I learned that the planning for the SOA meetings starts really early (we start working on the annual meeting in January each year). I discovered that the sections sponsor really important research that is

extremely valuable to practicing actuaries. I also found out about the many "friends of the council" that help out even though they are not elected to the council. These many volunteers help with everything from organizing section newsletters and recruiting for meetings, to overseeing the research sponsored by the SOA.

The Product Development Section has an especially great group of volunteers and they allow our section to do these many amazing things and more. Anyone is welcome to volunteer and we have lots of opportunities to get involved, many of which are a very small commitment of your time. If you're interested in finding out more about getting involved, I would encourage you to contact me or one of the other council members listed on the inside front cover of this newsletter.

As I look back on that spring day in Toronto, I'm glad that I decided to say "yes" to the opportunity to get involved with the Product Development Section Council. I've met some great people and learned a lot about the Society of Actuaries. Starting in October of 2015, I began my term as the chair of the Product Development Section Council. I'm excited about the work we have planned for the upcoming year as we continue to provide great content to our members.

Best of all, I'm now the one that gets to ask "Have you ever thought about getting involved with the Product Development Section?"



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Individual Annuity Sales And Product Trends

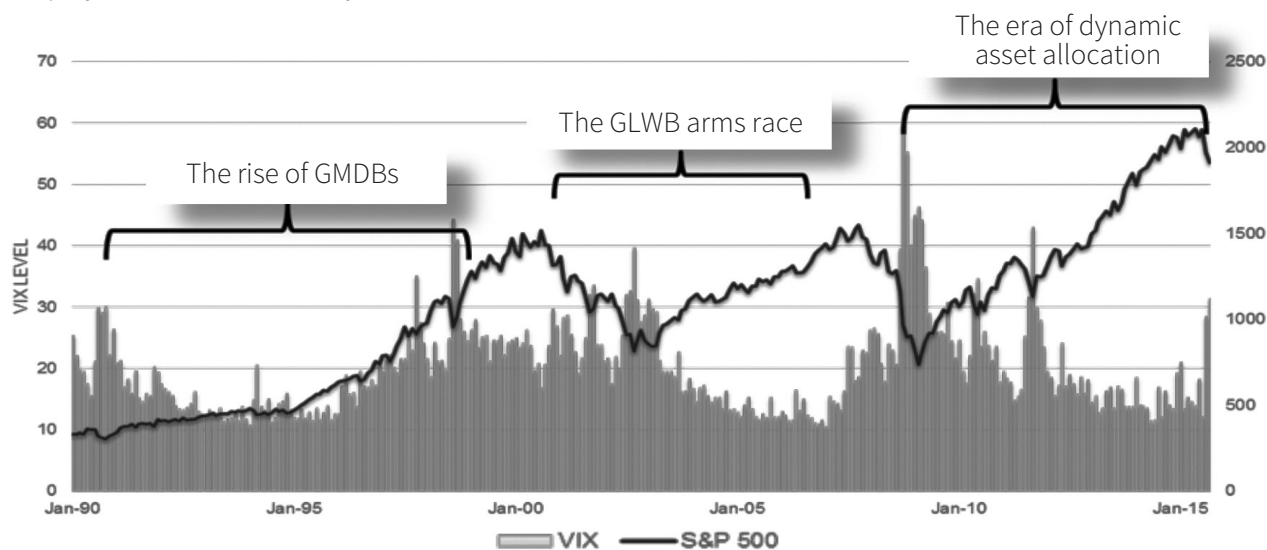
By Simpa Baiye

Thomas Edison was once quoted as saying: “There’s a way to do it better—find it.” Product innovation in the annuity marketplace is an excellent demonstration of the drive to find a better balance between consumer needs for guaranteed income and sustainable insurer balance sheets. This has taken place against a backdrop of low rates and record-high equity market valuations. In this article, we’ll summarize broad trends across the U.S. individual annuity marketplace and focus on variable annuities, fixed indexed annuities and fixed annuities.

MACROECONOMIC OVERVIEW

A review of the individual marketplace is incomplete without an understanding of key economic variables that influence sales and product design. Chart 1 illustrates the evolution of equity market returns (measured by the S&P 500) and market volatility as measured by the VIX index.

Chart 1: Equity Markets and Volatility

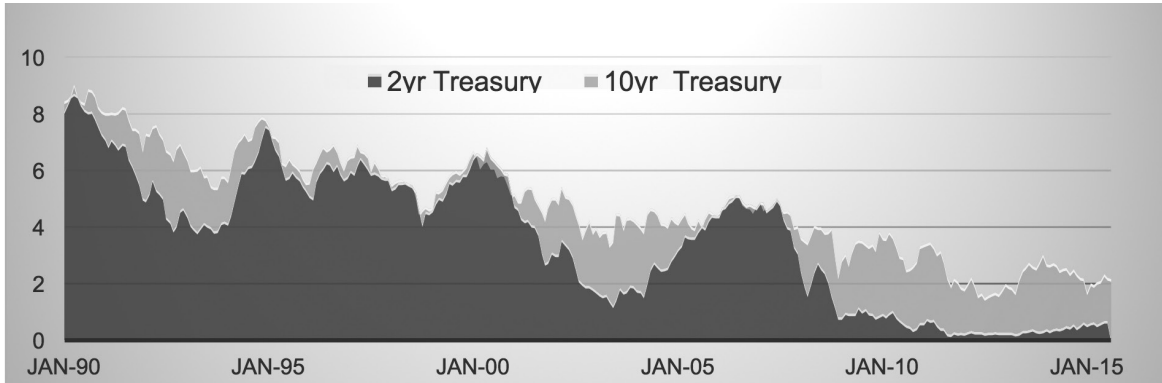


Source: Yahoo.com

Years 2002 through 2007 were marked by an aggressive push by insurers for share in the individual annuity space through attractive Guaranteed Lifetime Withdrawal Benefit (GLWB) offerings. The financial crisis brought about a strategic reset for many insurance carriers as interest rates were lowered and equity volatility rose. Years 2009 and beyond have been marked by both a required asset allocation shift away from equities and the use of dynamic asset allocation. Dynamic asset allocation comprises the use of “portfolio insurance” strategies and risk-control strategies, supplemented by a significant required allocation to fixed income. Managed-volatility risk-control strategies, in particular, were introduced in 2009—a year that marked the beginning of both stellar equity market performance and a drop in market volatility. Notwithstanding the value that managed volatility strategies have brought to the annuity space, a 60 percent equity/40 percent bond balanced fund would have likely performed better than a comparable target-equity-volatility fund from 2009 to the present time. Some in the financial advisory community have taken note of this and now question somewhat—with the benefit of hindsight—the consumer value of managed-volatility risk control.

Interest rate movements are also notable. Chart 2 shows that the 10yr/2yr Treasury rate spread—a proxy for spreads between shortterm and longterm rates—had not historically stayed very wide for more than roughly five years at a time, even in periods of relatively higher rates. However, years 2008 and beyond have been marked by both a historically unusual low rate environment and an extended high rate spread. This has both spurred a shift by consumers to fixed annuities with longer sales charge periods and created opportunities to design products geared for an anticipated shift to a higher interest rate environment. This low rate period has also led to a change in consumer expectations about the level of anticipated retirement income and the length of pre-retiree working years.

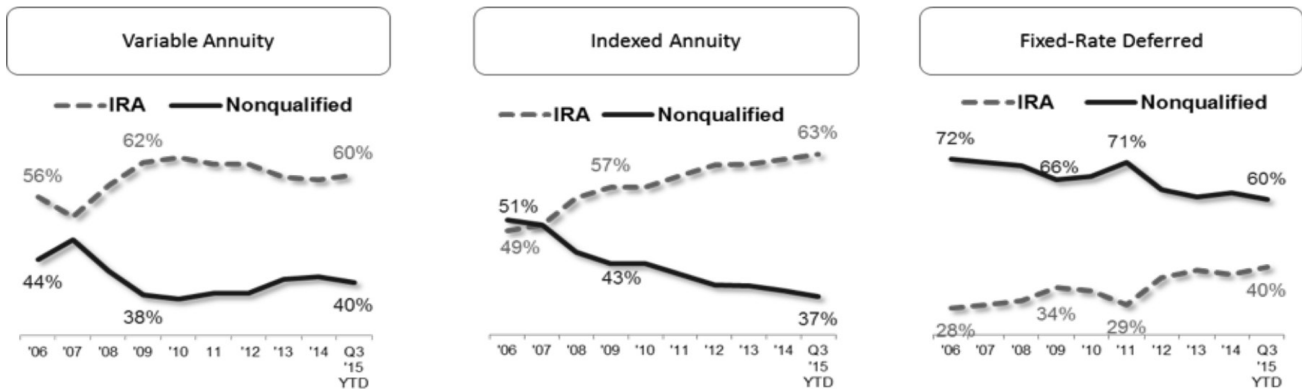
Chart 2: U.S. Treasury Rates by Year



Source: Stlouisfed.org

Broad trends in the distribution of sales across the major annuity types are also revealing. It is clear from Chart 3 that retirees increasingly seek the safety of guaranteed income offered by annuity products. Qualified assets represent much of the current flow into annuity products relative to years past. Chart 3 also shows that indexed annuity sales in particular, are a reflection of that desire for guaranteed income.

Chart 3: Qualified Retirement Assets and Individual Annuities



Source: U.S. Individual Annuities survey, LIMRA
 Retail = IRA + Nonqualified annuity sales.
 Fixed-rate deferred annuities = book value + market value adjusted annuities.

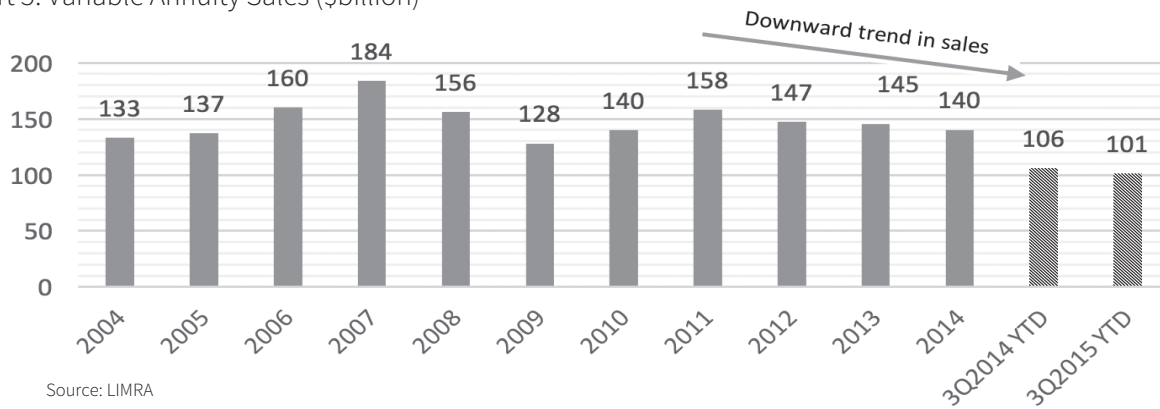
VARIABLE ANNUITIES

Variable annuity sales overall have recovered somewhat from their steep drop in sales with the great financial crisis of 2008. Insurers have “derisked” their guarantee offerings every year since 2008, with 2015 being no exception.

Guarantee offerings with rate schedules that can be quickly changed are more prevalent. Insurers now largely require some form of allocation to managed volatility funds or funds with dynamic asset allocation for GLWB elections. The overall target allocation to equities for variable annuity guarantees has been lowered in order to keep guarantee rider charges more affordable and manage the overall guarantee risk profile for insurers.

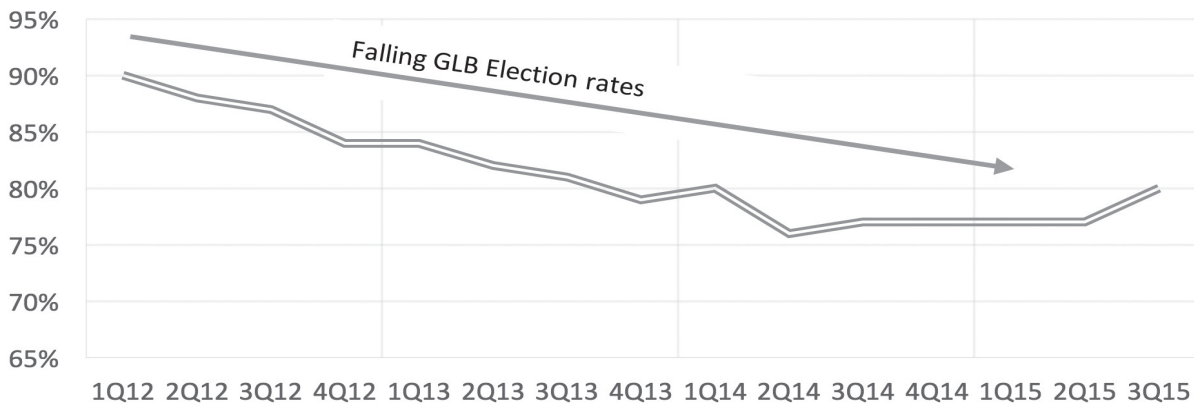
Charts 5 and 6 both suggest that the drop in variable annuity sales is connected to the overall downward trend in guaranteed living benefit elections. Feedback from distributors also suggests that the overall decline in GLWB elections has been driven in part by the drop in perceived value of available GLWBs to policyholders. This new generation of lower-risk GLWBs are much better for the balance sheets of insurance companies, but offer less attractive accumulation opportunities to policyholders. This has led to growth in investment-only variable annuity (IOVA) offerings, which generally offer a much expanded menu of investment choices that allow policyholders to grow their retirement assets until or unless guarantees need to be purchased.

Chart 5: Variable Annuity Sales (\$billion)



Source: LIMRA

Chart 6: Variable Annuity GLB Election Rates



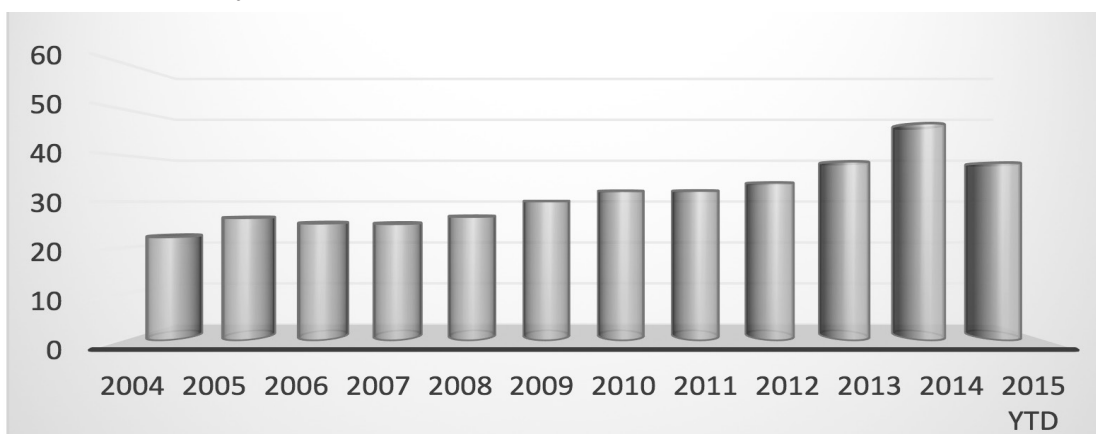
Source: LIMRA

FIXED INDEXED ANNUITIES

Fixed Indexed Annuities (FIA) sales have grown steadily for every year and have experienced significant growth in sales in the past couple of years. Chart 7 outlines this increase in market share for indexed annuities. This growth has been driven by an expansion of indexed annuities within the broker-dealer channel, the proliferation of managed-volatility indices, and the adoption and acceptance of GLWBs across distribution channels. That indexed annuity sales are growing at a time when variable annuity sales have remained stagnant is no coincidence. Securities-licensed intermediaries are increasingly comparing the value of variable annuity guarantees to indexed annuity guarantees near the point of sale in order to determine the best perceived value for their clients. GLWBs on indexed annuities generally offer more guaranteed income at the cost of the possibility that guaranteed income levels will grow. GLWBs on variable annuities, on the other hand, offer lower guaranteed income at the onset but generally offer the higher possibility that contract value appreciation could raise guaranteed income levels when withdrawals ultimately start. This tradeoff of guaranteed withdrawals for contract appreciation can be skewed to the extent that variable annuities are priced much more conservatively relative to indexed annuities.

According to tracking data from LIMRA, election rates for GLWB have risen from about 50 percent in 2010 to just under 60 percent as of 2015. The fact that these election rates are lower than election rates on variable annuities can be attributed to the fact that indexed annuities have historically been seen as conservative accumulation alternatives to fixed annuities and CDs. The increasing adoption of indexed annuities as a viable income generation vehicle should raise the election rates for GLWBs over time.

Chart 7: Fixed Indexed Annuity Sales (\$ billion)



Source: LIMRA

Living benefit riders that provide a form of non-underwritten long-term care benefit are becoming more available. These riders offer benefits tied to a guaranteed base amount established at contract inception and require the fulfillment of specific assisted daily living criteria.

FIXED-RATE DEFERRED ANNUITIES

Fixed annuity sales have been impacted by the low rate environment, with sales leveling off or slightly declining in the past three years. Policyholders now generally elect longer rate terms and effectively reach for an attractive yield. Some insurers are now exploring the value of providing guaranteed lifetime withdrawal benefits on fixed annuities, and a number have launched these riders with limited success. The key value proposition of guaranteed lifetime withdrawals on fixed annuities is not the safety of principal (as the insurer already guarantees this balance) but is the opportunity to take guaranteed lifetime withdrawals. Fixed annuities with guaranteed lifetime withdrawals are conceptually closest to SPIA and DIA products that offer liquidity. It is yet to be seen how successful these riders will be in helping grow fixed annuity sales.

DEFERRED INCOME ANNUITIES

Deferred income annuities have grown in sales amongst a limited number of carriers. These products offer significant future income stream in exchange for a modest lump sum deposit and a long wait period before withdrawals start. Sales of deferred income annuities have been somewhat insignificant, with total industry sales in 2014 (according to LIMRA) of approximately \$3 billion. Deferred income annuities are still expected to do well in the employer market, with the recent Department of Labor ruling on qualified longevity annuity contracts. Their success in the IRA space is all but certain, given the relative ease with which consumers can obtain both accumulation, decumulation and contingent annuitization in deferred annuities with guaranteed lifetime withdrawal options. For example, a variable annuity contract with a guaranteed lifetime withdrawal benefit of 5 percent can be viewed as an accumulation contract that allows for accumulation and planned withdrawals of 5 percent, with a contingent deferred income annuity of 5 percent per year if or when the contract runs out of money. Advisors looking to sell deferred income annuities will likely have to show their value as part of an integrated retirement solution-relative to deferred annuities with guarantees.

CONCLUSIONS

Product trends in the annuity marketplace point to a much healthier balance between a variety of consumer risk-tolerances and insurer sustainability. For a variety of arguably good reasons, variable annuity have not regained the momentum last experienced before the 2008 financial crisis. Fixed indexed annuities are increasingly seen as the vehicle of choice for guaranteed income and steady asset accumulation. The underlying innovation and shift in product sales have taken place in a period of sustained low rates, low market volatility and a significant equity market bull-run. Managed volatility offerings in both variable and fixed indexed annuities have provided a significant boost to overall individual annuity sales. The next secular change in the financial markets may very well challenge certain aspects of products that have done fairly well from a sales and earnings standpoint. High interest rates, for example, could make it more challenging and costly to retain fixed-indexed-annuity policyholder assets, but may leave insurers without interest rate-hedges on their VA guarantees in a much better financial position. Variable annuity guarantees with interest-indexed withdrawal rates would likely

do better in a rising rate environment. In the words of Picasso: "Every act of creation is first an act of destruction." Creative and meaningful adaptation to the evolving financial and demographic landscape will remain an imperative for insurers, as aspects of current income solutions are rendered less useful.

Note: The views expressed herein are those of the author and do not necessarily reflect the views of PricewaterhouseCoopers LLP.



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SOCIETY OF ACTUARIES

LIFE INSURANCE & MODIFIED ENDOWMENTS
Under Internal Revenue Code Sections 7702 and 7702A
Second Edition

NEW EDITION

- ▶ This new edition provides a comprehensive analysis of the life insurance qualification requirements imposed by the Internal Revenue Code
- ▶ It includes a restructuring and expansion of materials presented in the first edition, with over 100 pages of new information, including:
 - ▶ Two "student friendly" chapters that present an introduction to the qualification requirements of Section 7702 and 7702A
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 - ▶ Expanded discussions on:
 - The adoption of the 2001 CSO mortality tables and the relevant IRS guidance relating to the section 7702(c)(3)(B)(i) "reasonable mortality" requirements
 - The 2008 updates to the IRS correction procedures for noncompliance with sections 7702 and 7702A
 - Numerous private letter rulings and other IRS guidance issued since the publication of the first edition
 - And more...

Exploring at the Velocity of Diversification

By Dan Theodore

INTRODUCTION

In the June 2014 issue of *Product Matters!*, Doug Robbins of Pacific Life authored a fascinating article entitled “Velocity of Diversification.” Therein, he proposed a pricing measure that describes the “...speed at which confidence in profitability is attained.” For products with relatively low anticipated sales counts, this may be a useful measure to avoid the statistically significant risk of loss when the law of large numbers may not apply. Mr. Robbins suggests that the velocity of diversification may be expressed so as to capture the number of sales required to achieve a level of confidence determined by management (e.g., 95 percent) in the profitability of the business. He goes on to explore the connection between this approach and stochastic simulation. The implication is that the sales and marketing will be expected to achieve that minimum level of sales to satisfy the risk management goals of the company.

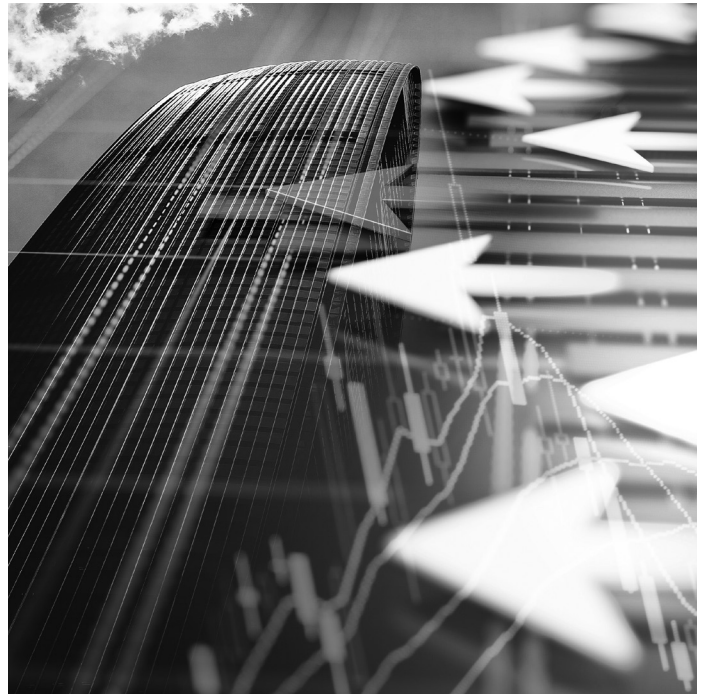
This topic was of particular interest to me. During the past several years, I, along with some of my colleagues, have been exploring stochastic simulations of future mortality, developing models that capture the effects of volatility over (a) date of death, (b) mortality table fit, (c) future mortality improvement rates, and (d) other sources (e.g., pandemics, new cures and treatments).¹ The article sent me scurrying back to my models. Specifically, how can stochastic modeling of mortality be applied to analyze the velocity of diversification, and how would that measure be affected by volatility in the underlying assumptions?

REINVENTING THE WHEEL

To start off, I reworked Mr. Robbins’ analysis using a slightly more complex example for a life annuity due for a male age 65. I assumed expected mortality equal to the U.S. Annuity 2000 Basic Table with Projection Scale G.

$$q^{Best\ Estimate} = q^{Annuity2000Basic} \times (1 - Imp^{ScaleG})^{(Year-2000)}$$

The present value of profit goal was set to approximately 8.00 percent² of premium, at a discount rate of 3.0 percent. The expense assumptions of 3.75 percent commission plus \$100 per



policy per year while payments are being made are the same assumptions as used in his article.

Following this approach, for an initial premium of \$100,000, annual payments and their resulting profit margins were developed as shown in Table 1:

Table 1: Life Annuity Due – Initial Pricing

	Life	Life + 10	Life + 20
Annual Benefit Payment	\$ 5,335	\$ 5,200	\$ 4,755
Expected Profit Margin	8.07%	8.04%	8.07%

For a single annuity contract, the actual profit margin will depend on the annuitant’s year of death. This is explored in Table 2, where the profit margin for a specific year of death is defined as

$$\text{Profit Margin} = 1 - \text{PV}@3.0\% \{ \text{Annuity Payments plus Expenses} \} / \$100,000$$

Table 2: Life Annuity Due

Year	Attained Age	Probability of Death		Profit Margin if Death in Year		
		in Year ${}_{t-1}P_x Q_x$	by Year (Cumulative)	Life	Life + 10	Life + 20
1	65	0.876%	0.876%	90.82%	49.68%	21.85%
6	70	1.366%	6.599%	65.92%	49.68%	21.85%
11	75	1.992%	15.333%	44.45%	45.74%	21.85%
16	80	2.644%	27.232%	25.93%	27.68%	21.85%
21	85	3.194%	42.201%	9.96%	12.10%	19.16%
24	88	3.419%	52.206%	1.44%	3.80%	11.56%
25	89	3.496%	55.703%	-1.23%	1.19%	9.17%
26	90	3.546%	59.249%	-3.83%	-1.34%	6.85%
29	93	3.422%	69.785%	-11.17%	-8.50%	0.30%
30	94	3.268%	73.053%	-13.47%	-10.75%	-1.76%
31	95	3.090%	76.143%	-15.71%	-12.93%	-3.77%
36	100	2.628%	89.770%	-25.97%	-22.93%	-12.93%
41	105	0.928%	98.435%	-34.81%	-31.56%	-20.83%
46	110	0.071%	99.954%	-42.44%	-39.00%	-27.64%
51	115	0.000%	100.000%	-49.03%	-45.42%	-33.52%

By this analysis, there is a positive gain for Life-Only if death occurs in the first 24 years, which has a cumulative probability of approximately 52 percent. The Life and 10 Years Certain Annuity Due is still profitable if death occurs within 25 years, which has a cumulative probability of approximately 55 percent. Finally, the Life and 20 Years Certain Annuity Due produces positive gain if death occurs within 29 years, which has an approximate cumulative probability of nearly 70 percent. The results parallel Mr. Robbins' examples. That is, although the three alternatives have the same expected profit margin of approximately 8 percent, the insurer should recognize the financial advantage of marketing the longer period certain.

Next, a stochastic projection was used to determine the number of annuity sales to provide the insurer with a 95 percent confidence of a positive total profit margin over all years of death. For each individual annuitant, the year of death is simulated to be equal to the number of years for which the cumulative survival rate is greater than a random number drawn between 0 and 1. The year of death for each sample policy corresponds to a "Profit Margin if Death in Year" for Life, Life and 10, or Life and 20, the average of which may be taken for portfolios of one or more policies. The results shown in Table 3 were produced by repeating this process for a sufficient number of trials:

Table 3: Approximate Number of Annuities Required To Achieve 95 percent Confidence of Positive Profit Margin

Life	Life + 10	Life + 20
36	26	9

Again the result demonstrates a significant advantage to the insurer in encouraging sales of the longer periods certain, in this case by reducing the sales required to minimize risk of loss. Note that the results are shown independently for each product variation.³ Table 4 demonstrates how the standard deviation differs as the number of annuities increases for each of the alternative periods certain.

Table 4:
Standard Deviation of Profit Margin over 2000 Trials
For Given Number of Annuities

# Annuities	Life	Life + 10	Life + 20
10	9.78%	8.20%	4.67%
25	6.25%	5.20%	2.94%
50	4.29%	3.57%	2.01%
100	3.06%	2.55%	1.44%
250	1.98%	1.65%	0.92%
500	1.38%	1.15%	0.64%
750	1.11%	0.93%	0.53%
1000	0.96%	0.81%	0.45%
1500	0.78%	0.66%	0.37%
2000	0.68%	0.58%	0.32%
2500	0.61%	0.51%	0.29%

Thus far, this article has paralleled the analysis described in the previous article by Mr. Robbins.

However, up to this point, the mortality curve has been assumed to be static. In other words, the mortality curve to be expected for these annuitants has been determined with 100 percent certainty. What happens if we acknowledge that we do not have 100 percent certainty of the mortality assumption?

VOLATILITY OF MORTALITY IMPROVEMENT

Historical mortality improvement has been measured for many years and has demonstrated long term and short term trends. Although the long-term trends may be measured and projected, the annual change to mortality has been quite volatile from year to year and from one age to the next. Consider Graph 1 of U.S. Population annual mortality improvement rates reported 1980-2010.

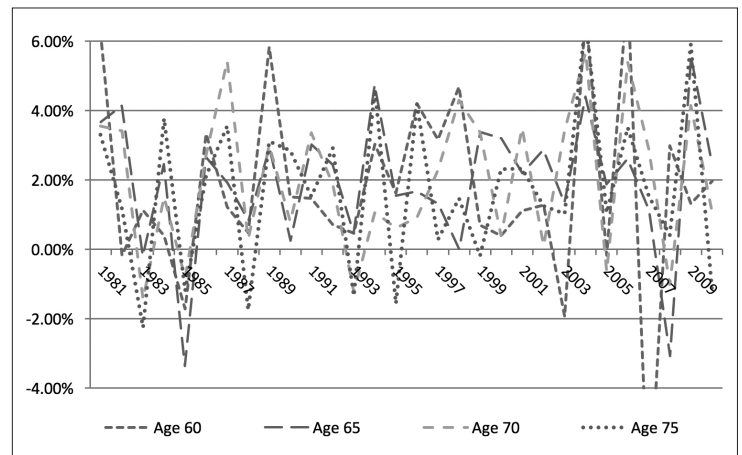
Making financial projections based on “average” mortality improvement may fail to capture the variability of results based on the incidence of annual experience which could have a significant effect on the results. This is one reason to use stochastic projections reflecting volatility in mortality improvement in pricing models.

We utilized REVEAL⁴, a proprietary Milliman software tool used to analyze longevity risk and the impact of volatility in future mortality rates, to stochastically generate volatile mortality curves. The methodology takes into account average long-term trends (in this case as measured over 10-year periods) and annual volatility. The average across 10-year age groups may be used to reduce statistical noise, but that does not eliminate the an-

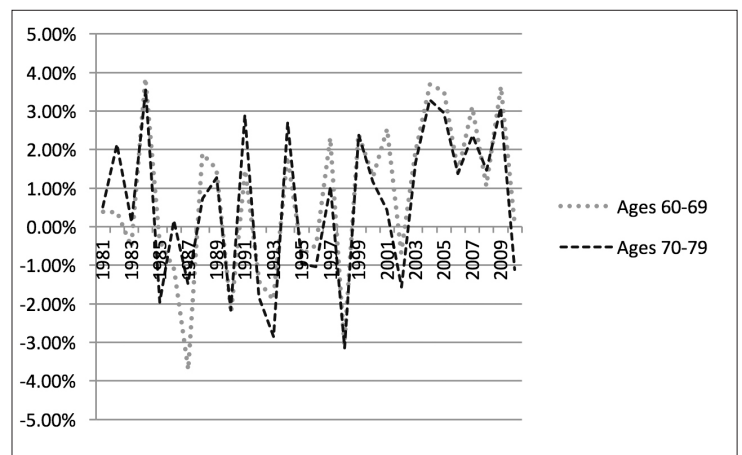
nual volatility. The general trend towards improving mortality is apparent, as is the high correlation between consecutive age groups in Graph 2.

Stochastic projections of annual population improvement were derived consistent with the long-term and short-term expected values and standard deviations, also taking into account the correlation across all ages. For each scenario, the excess (shortfall) between each projected annual rate of improvement over the average historical rates are added to (subtracted from) the expected annual improvement rates used in the pricing (Projection Scale G) for all the policies being tested in that scenario.

Graph 1: Annual Mortality Improvement – U.S. Population – Male



Graph 2: Average Annual Mortality Improvement U.S. Population – Male



Assume that stochastic modeling of mortality improvement volatility is calculated using

- Expected = Best Estimate Annual Improvement (Scale G),
- Plus/Minus random fluctuation of mortality improvement rates around average historic improvement rates, reflecting standard deviations observed over long-term (10-year) and short-term (annual) intervals in U.S. Population Mortality 1970-2010.

Table 5 shows that, based on 2,000 scenarios, each of which projected the results for 2,500 policies, the stochastic analysis converged to the profit margin expected under the static mortality assumption.

Table 5: Profit Margin (Stochastic Volatility Around Expected Mortality Improvement)

	Life	Life + 10	Life + 20
No Volatility – Average Profit Margin	8.07%	8.04%	8.07%
Volatility Around Expected Mortality Improvement – Mean Profit Margin	8.10%	8.07%	8.08%

Note that the minimum number of policies required to achieve 95 percent confidence of a positive return increases slightly with the additional volatility, as seen in Table 6.

Table 6: Approximate Number of Annuities Required To Achieve 95 Percent Confidence of Positive Profit Margin (Stochastic Volatility Around Expected Mortality Improvement)

	Life	Life + 10	Life + 20
No Volatility	36	26	9
Volatility Around Expected Mortality Improvement	39	27	9

And, naturally, the additional source of volatility is reflected in the elevated standard deviations over the 2000 trials in Table 7 as compared to those shown previously in Table 4.

Table 7: Standard Deviation over 2000 Trials For Given Number of Annuities (Stochastic Volatility Around Expected Mortality Improvement)

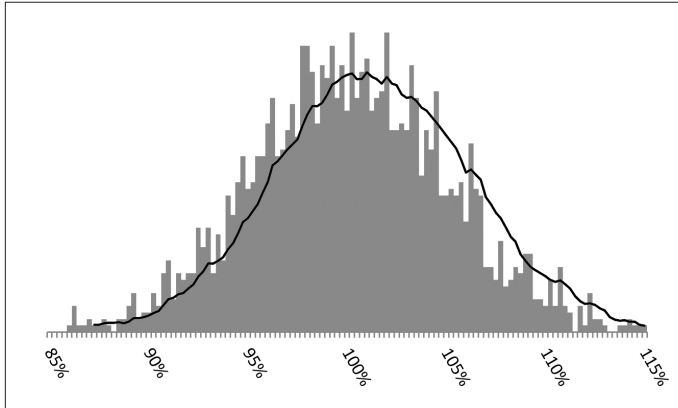
# Annuities	Life	Life + 10	Life + 20
10	9.91%	8.29%	4.71%
25	6.36%	5.35%	3.11%
50	4.59%	3.90%	2.33%
100	3.41%	2.95%	1.86%
250	2.50%	2.23%	1.50%
500	2.11%	1.93%	1.36%
750	1.95%	1.81%	1.31%
1000	1.89%	1.77%	1.30%
1500	1.82%	1.71%	1.27%
2000	1.79%	1.69%	1.27%
2500	1.76%	1.67%	1.26%

VOLATILITY OF EXPECTED RATING AND MORTALITY IMPROVEMENT

In selecting an expected mortality table (Annuity 2000 Basic in this case), an insurer is making an actuarial judgment. However, even if that selection is supported by past experience, experience may emerge that varies from that table, possibly attributable to the company characteristics and the profile of its distribution, or simply some slight skewing by region, type of employment, or other differential. Therefore, there is some risk that the “expected” table may be either higher or lower than the underlying reality of future mortality. This may be described as the level of uncertainty that the base table is 100 percent appropriate for the specific population.

This part of the analysis assumes that the starting expected mortality table is not known with full certainty. In addition to reflecting volatility in future mortality improvement patterns, the starting expected mortality table is assumed to be subject to a normal distribution around 100 percent with a standard deviation of 5.00 percent. As with the volatility of mortality improvement, a randomly generated value was used for each scenario which applied to the expected mortality in all years for all policies being tested in that scenario. The volatility of mortality improvement and the volatility of the expected mortality table are assumed to be independent.

Graph 3: Distribution of Adjustment to Expected Mortality (Over 2000 Trials with Curve of Moving Average)



While there are some discontinuities in Graph 3 that hint at the limits of using only 2,000 scenarios, the overall curve appears normal, with nearly all of the area between 90 percent and 110 percent (i.e., 95 percent confidence interval falls within the range of the mean \pm two standard deviations).

Assume that the stochastic modeling of mortality improvement is produced by a normal distribution using:

- Expected = Best Estimate Mortality (Annuity 2000 Basic), and
- Standard Deviation of Mortality Load = 5.00 percent.

Table 8: Profit Margin (Stochastic Volatility of Expected Mortality & Mortality Improvement)

	Life	Life + 10	Life + 20
No Volatility – Average Profit Margin	8.07%	8.04%	8.07%
Volatility Around Expected Mortality Improvement – Average Profit Margin	8.10%	8.07%	8.08%
Volatility Around Expected Mortality and Expected Mortality Improvement – Average Profit Margin	8.00%	7.98%	8.02%

As additional sources of volatility are introduced, we observe a phenomenon that I will refer to as the “Cost of Volatility” which effectively reduced the average profit margin in Table 8. As a result, the number of policies required to achieve 95 percent

confidence of a positive return increases with the additional volatility, shown in Table 9.

Table 9: Approximate Number of Annuities Required To Achieve 95 Percent Confidence of Positive Profit Margin (Stochastic Volatility of Expected Mortality & Mortality Improvement)

	Life	Life + 10	Life + 20
No Volatility	36	26	9
Volatility around Expected Mortality Improvement	39	27	9
Volatility around Expected Mortality and Expected Mortality Improvement	47	35	10

Also, the additional volatility is expressed in the elevated standard deviations over the 2000 trials shown in Table 10 as compared to the values shown previously in Tables 4 and 7.

Table 10: Standard Deviation over 2000 Trials For Given Number of Annuities (Stochastic Volatility Around Expected Mortality & Expected Mortality Improvement)

# Annuities	Life	Life + 10	Life + 20
10	10.19%	8.52%	4.82%
25	6.58%	5.50%	3.22%
50	4.80%	4.09%	2.48%
100	3.75%	3.26%	2.05%
250	2.89%	2.58%	1.72%
500	2.53%	2.30%	1.58%
750	2.41%	2.20%	1.53%
1000	2.33%	2.14%	1.50%
1500	2.26%	2.08%	1.47%
2000	2.23%	2.07%	1.46%
2500	2.21%	2.05%	1.46%

PRICING WITH MARGINS

The SPIA provides a long-term guarantee with no mechanisms for adjustment if experience deviates from expected. Assume that the 3 percent interest assumption has adequate margin for investment risk. If U.S. Annuity 2000 Basic Table with Projection Scale G has been defined as the “best estimate” for mortality, the prudent actuary will add some margin for contingencies to the pricing assumptions. Therefore, suppose that the pricing assumption includes a margin of 10 percent on the annual mortality and 50 percent on the future annual mortality improvement rates:

$$q^{\text{Best Estimate}} = q^{\text{Annuity2000Basic}} \times (1 - \text{Imp}^{\text{ScaleG}})^{(\text{Year}-2000)}$$

$$q^{\text{Pricing}} = q^{\text{Annuity2000Basic}} / 110\% \times (1 - \text{Imp}^{\text{ScaleG}})^{(2015-2000)} \times (1 - 150\% \times \text{Imp}^{\text{ScaleG}})^{(\text{Year}-2015)}$$

Keeping the target profit margin of 8.00 percent, in the initial premium of \$100,000, the revised (“Loaded using Fixed Baseline Margin”) annual payments are shown in Table 11.

Table 11: Annual Benefit Payments

	Life	Life + 10	Life + 20
Best Estimate – No Margin	\$ 5,335	\$ 5,200	\$ 4,755
Loaded using Fixed Baseline Margin	\$ 5,080	\$ 4,970	\$ 4,610

The resulting profit margins shown in Table 12 are comparable to those seen previously, where the Best Estimate Annual Benefit Payments are evaluated assuming Best Estimate Assumptions for mortality and improvement and the Loaded Annual Benefit Payments are evaluated using the Fixed Baseline Margins in the assumptions.

Table 12: Profit Margin (Pricing with Margins)

	Life	Life + 10	Life + 20
Best Estimate – No Margin	8.07%	8.04%	8.07%
Loaded using Fixed Baseline Margin	8.03%	8.01%	8.01%

It is worth remembering that the fixed margin serves to protect the insurer against variations in mortality and improvement experience that produce losses. The problem is that the amounts of those margins are arbitrary and are not associated with any specific range of variation. Substituting stochastic volatility projections with known parameters around the Best Estimate assumptions for mortality and improvement will give greater insight into the pricing results, as shown in Table 13.

Table 13: Approximate Number of Annuities Required To Achieve 95 percent Confidence of Positive Profit Margin

	Life	Life + 10	Life + 20
No Margin - Volatility around Expected Mortality and Expected Mortality Improvement	47	35	10
Loaded - Volatility around Expected Mortality and Expected Mortality Improvement	15	12	5

As should be expected, providing a lower annual benefit payment (developed using the Fixed Baseline Margin) reduces the number of policies required to be sold to achieve a positive profit at least 95 percent of the time when applying volatility of Expected Mortality and mortality improvement around the best estimate assumptions.

Now we can explore how we can adjust the margin to reflect expected sales results.

PRICING USING STOCHASTIC PROJECTIONS FOR MORTALITY VOLATILITY AND EXPECTED SALES

Suppose that the marketing department produces sales forecasts that exceed the minimum number of annuities to achieve the 95 percent confidence interval for positive profit margin (and is willing to commit to achieving those goals). Assume that the sales prediction is as described in Table 14.

Table 14: Assumed Sales Forecast – Estimated Number of Annuity Contracts

	Life	Life + 10	Life + 20
Forecast Sales Volume	25	15	7

The forecast sales counts exceed the respective minimum sales of 15, 12 and 5 annuities that were derived for the baseline margins of 10 percent mortality plus 50 percent margin for improvement, and less than the minimum sales of 47, 35, and 10 respectively required for the “no margins” annual payments (as shown in Table 13). Thus, while some margin may be needed, smaller margins could satisfy the 95 percent probability of positive profit margins at these higher counts, and provide for more competitive payout rates.

At this point, it is possible to develop reduced levels of “loaded” mortality and improvement around which stochastic volatility may be applied at the levels described earlier and repeated here:

- Mortality:
 - Normal Distribution with
 - Expected Mortality = Annuity 2000 Basic
 - Standard Deviation of Mortality Load = 5.00 percent;
- Mortality Improvement:
 - Expected Annual Improvement = Scale G
 - Plus/Minus random fluctuation of mortality improvement rates around average historic improvement rates, reflecting standard deviations observed over long-term (10-year) and short-term (annual) intervals in U.S. Population Mortality 1970-2010.

For example, we will consider if the earlier margin were reduced by 50 percent. That is, the alternative pricing assumption includes reduced margins of 5 percent to the annual mortality and 25 percent to the future annual mortality improvement rates:

$$q^{\text{ReducedMargin}} = q^{\text{Annuity2000Basic}} / 105\% \times (1 - \text{Imp}^{\text{ScaleG}})^{(2015-2000)} \times (1 - 125\% \times \text{Imp}^{\text{ScaleG}})^{(\text{Year}-2015)}$$

Keeping our target profit margin of approximately 8.00 percent, we see in Table 15 that the annual payments are substantially higher than those produced using our baseline margins (but naturally still less than those paid if priced with only the unloaded “best estimate”).

Table 15: Annual Benefit Payments

	Life	Life + 10	Life + 20
Best Estimate – No Margin	\$ 5,335	\$ 5,200	\$ 4,755
Loaded Baseline Margin	\$ 5,080	\$ 4,970	\$ 4,610
Revised Loaded	\$ 5,205	\$ 5,080	\$ 4,680

The profit margins remain comparable as seen in Table 16.

Table 16: Profit Margin with No Volatility

	Life	Life + 10	Life + 20
Best Estimate – No Margin	8.07%	8.04%	8.07%
Loaded using Fixed Baseline Margin	8.03%	8.01%	8.01%
Revised Loaded using Fixed Reduced Margin	8.01%	8.04%	8.06%

More to the point, the number of policies to achieve the target 95 percent confidence interval is very nearly equal to the sales forecast, as seen in Tables 17.

Table 17: Approximate Number of Annuities Required To Achieve 95 percent Confidence of Positive Profit Margin

	Life	Life + 10	Life + 20
Forecast Sales Volume	25	15	7
Best Estimate – No Margin Volatility Around Expected Mortality and Expected Mortality Improvement	47	35	10
Baseline Margin for Contingencies Volatility Around Expected Mortality and Expected Mortality Improvement	15	12	5
Reduced Pricing Margin Volatility Around Expected Mortality and Expected Mortality Improvement	26	17	6

Therefore, the use of stochastic projections of liability cash flows may be applied to the velocity of diversification to produce more sophisticated and useful analyses of risk and profitability.



ENDNOTES

- ¹ The other sources of mortality volatility are outside the scope of this article.
- ² To be consistent with Mr. Robbins' analysis, the analysis was performed simply on a net cash flow basis without consideration of the effect of statutory reserves and capital.
- ³ We would expect that the minimum number of combined sales of the three products to achieve the 95 percent probability of positive profit margin would equal some weighted average of the independent results. That analysis is outside the scope of this article.
- ⁴ REVEAL (which stands for Risk and Economic Volatility Evaluation of Annuitant Longevity) is a system developed to analyze longevity risk. REVEAL generates stochastic projections on pension and annuity liabilities with volatile assumptions (i.e., baseline mortality, mortality improvement, extreme mortality and longevity events, and annuitant (or plan participant) behavior - such as retirement dates and benefit elections). For more information about REVEAL, please see <http://www.milliman.com/Solutions/Products/REVEAL/>.

CONCLUSION

Currently most stochastic actuarial projections only utilize volatile economic assumptions. This article makes the case that it is important to reflect volatile liability assumptions when performing stochastic projections. Without taking liability assumptions into account, stochastic projections may understate the potential volatility associated with the liabilities. As such, insurers may fail to calculate a price that compensates them for the cost of volatility.

But there is an equally strong possibility that actuaries may use stochastic projections of liability cash flows to discover excesses in their explicit or implicit margins, potentially allowing them to build a more competitive and more profitable product.

Note: The views expressed herein are those of the author and do not necessarily reflect the views of Milliman, Inc.



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10

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Highlights of Sessions at the 2015 SOA Annual Meeting & Exhibit

By Kurt A. Guske

This article contains a summary of some of the presentations given at the 2015 SOA Annual Meeting & Exhibit, held October 11–14, in Austin. 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, Vera Ljucovic at vljucovic@scor.com, or me at kurt.guske@aig.com.

LIFE PRODUCT TRENDS BY PAUL FEDCHAK

“Life Product Trends” is a staple session at each annual meeting, and 2015 was no exception. This year Paul Fedchak began the panel discussion with a high-level statistical overview of the life insurance market. Paul made one key observation in regards to the long-term trend of traditional products gaining market share relative to universal life. Another key observation was the trend of indexed universal life, which has grown exponentially over the last fifteen years and continued picking up steam more recently. Paul also demonstrated the increased prevalence of long-term care and chronic illness riders on universal life. Each of these trends was tied to one or more of three major external influences: economic environment, regulation, and demographics.

Bill Winterman followed Paul and provided increased detail on aspects of the life insurance market. Bill showed data regarding the ongoing term re-pricing observed in the market. He then provided an excellent summary of the underwriting spectrum of life products from full medical underwriting to guaranteed issue. Bill discussed the upswing of limited underwriting products, including typical simplified underwriting parameters in additional detail and highlighting key risk mitigation techniques used throughout the industry. Bill concluded with comments on AG-48 and noted that, despite early concerns, companies have mostly taken the new guideline in stride.



Chuck Preti continued the panel discussion with a refreshing change of perspective. Chuck focused on products that have recently lagged in the market, but could thrive with proper execution. The first product that Chuck examined was one typically sold as a rider—the accelerated death benefit. Chuck noted that the benefit is often difficult for the consumer to quantify, and therefore perceived as too expensive. The next underdeveloped product that Chuck addressed was reversionary annuities. Chuck pointed out that agent and consumer unfamiliarity and beneficiary inflexibility were two possible causes of the product’s lagging sales. Chuck closed the session with thought provoking reasons why ULSG has lost some of its former luster. Unclear communication to the policyholder seems to be a motif common to several of the reasons.

INDEXED PRODUCT DEEP DIVE BY JEREMY BILL

This session took an in depth look at topics that impact both indexed annuities and indexed life products. Tim Pfeifer began the sessions with a discussion of some of the recent trends in the market. For indexed annuities, the emphasis has been on volatility controlled indexed and guaranteed lifetime withdrawal benefits, but these same benefits have not become popular for Indexed Life.

Next, Guillaume Briere-Giroux focused on some financial reporting issues related to indexed products. He described the reporting requirements under US stat and GAAP accounting and he shared the results of a recent financial reporting survey related to Indexed UL.

The final speaker was Christopher Foote, who provided a home office perspective related to some of the “real world” challenges with indexed products. He described an analytical framework that could be used to explain some of the “noise” that is created by indexed products.

2017 CSO IMPACTS BY ANDREW BOYER

Here are some of the key points discussed in comparing reserves using the 2017 CSO tables versus 2001 CSO, based on the results of the Impact Study.

20-year term reserves (using VM-20 NPR) are reduced by 30-45 percent overall for the entire benefit period. There are larger reductions for nonsmokers, residual classes and issue age 45.

Whole life CRVM reserves are reduced by 6-10 percent overall after five years, grading off gradually. There are larger reductions for males, nonsmokers and issue ages 25-45.

Universal Life with secondary guarantee reserves, using VM-20 net premium reserve, are reduced by 5-11 percent overall after five years, grading off gradually. Unlike WL, there is still some impact after 50 years. There are larger reductions for males, nonsmokers, residual classes and issue ages 25-45.

Similar to 2001 CSO, using the 2017 CSO ultimate rates generally produces lower reserves than the 2017 CSO S&U rates. Exception is the final year of the 20-year term plan because of negative terminal reserves floored at zero and lower net premiums on S&U basis.

For more details, see:

<https://soa.org/files/research/projects/2017-cso-impact.pdf>

<https://soa.org/files/pd/2015/annual-meeting/pd-2015-10-annual-session-169.pdf>



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Agile Methodology: The Future of Insurance Product Development?

By Kelly Rabin and Gary Baluta

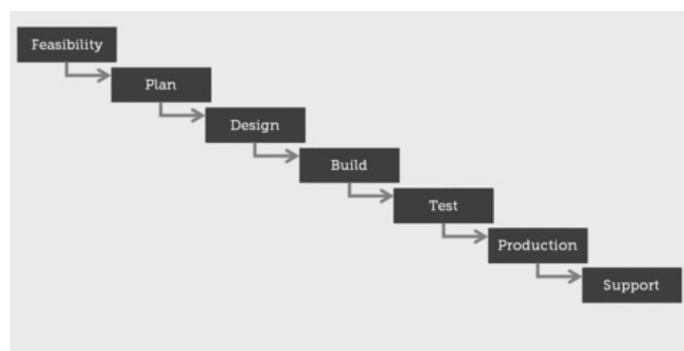
“Agile” development is all the buzz in the IT world. You may have heard your IT teams talk about “scrums,” “sprints,” and “the war room” and wondered if they were playing a strange new sport. Or perhaps you are already applying agile techniques in your product development. This article will discuss what agile methodology is, the pros and cons, and how you might apply it to insurance product development.

WHAT IS AGILE DEVELOPMENT METHODOLOGY?

Agile development methodology is a relatively young and much more collaborative way of creating and launching products to the marketplace, most commonly used in an IT setting. Before we get into the details around agile, we will discuss the more traditional approach it replaces, typically referred to as “waterfall.”

What does a waterfall approach look like? Think Gantt charts and MS Project, as illustrated in Figure 1. It is a stepwise approach in which each phase of the development life cycle is completed by the appropriate team and then passed to the next team. The major issue with this approach is that it often limits communication between the various groups involved in the product life cycle (product management, development, and quality assurance), sometimes resulting in products that do not meet expectations. Formal requirements and specifications documents are created and approved early in the process. If there is minimal input and collaboration with downstream areas during this process, the specs can be subject to misinterpretation and unauthorized modifications.

Figure 1. Diagram of Waterfall Development Methodology



Source: Manifesto Digital, London, England

How does agile differ from this? The core of agile methodology is that decisions are not made until they have to be, allowing the product to adapt to evolving business conditions. Rather than locking down specs for the entire build at the inception of the project, agile uses cycles called “sprints” that focus on specific pieces of the project (see Figure 2). Requirements are determined as needed. The length of a sprint can vary, but typically it is two to four weeks of focused effort. During the sprint, teams are ideally co-located (with access to a dedicated collaboration space called “the war room”) and have daily team meetings (often called “stand ups” because they are intended to be brief and focused on communicating key open issues to the broader team and identifying next steps). This culture of open communication and collaboration aims to avoid “coding in a vacuum” in which a programmer is only focused on their piece of the project and is not aware of how their work might impact other areas. It also aims to avoid launching products that are already obsolete.

Figure 2. Diagram of Agile Development Methodology



Source: Manifesto Digital, London, England

A common agile approach is referred to as “scrum.” There are three main roles in this process:

- **Product Owner** – a member of the product management team (or someone who works closely with them) responsible for defining the product and prioritizing the importance and order of the development task list (called the backlog). They are also the liaison to customers and internal stakeholders, responsible for identifying market needs and keeping everyone up to date on project status. The product owner’s primary focus is on product content.
- **Scrum Master** – a member of the development team primarily focused on managing the processes required to successfully build the product. They also facilitate the exchange of ideas and ensure that the team remains organized and efficient.
- **Team Members** – analysts, developers, and testers who are responsible for the formal building of the product. There

are no managers assigned to the team. Members get their task list (called stories) from pre-sprint meetings (called iteration planning) and are responsible for completing them as expected. They all have equal input into determining which tasks are to be worked on and by whom. Estimates for how long each task should take are also discussed and agreed upon before each sprint commences.

While the concept of agile development sounds fairly simple, it is often anything but. There are many moving parts inherent in this collaborative process. This can cause poor results if the product owner and/or scrum master are not plugged in to what the team members are doing. The nature of agile methodology can result in many decisions being made “on-the-fly” that often are not as well thought through as they should be. There is risk that developers will make important design decisions without consulting the product owner. Co-location and stand-up meetings are intended to reduce this risk, but they are not foolproof, particularly when on a tight deadline.

In order to address these issues, organizations have recently started to utilize a hybrid version of agile development in which a documented set of requirements is created before development begins. These plans are shared with the development team in an iterative review process, with the intent being to finalize the “what,” in terms of product content. The development team then scopes out the details of the product design using the list of requirements previously agreed upon. These details are documented in the specifications, representing the “how,” how a product should be coded and should function from a technical perspective. This is also an iterative process requiring discussion and consensus. Once the requirements and specifications documents have been created, the agile process kicks in—stories are defined using the existing requirements and developed during sprints, according to a master schedule.

This hybrid adaptation adds some additional meetings and discussions up front, but it also provides transparency and defines a point in the process where team members and customers can provide design input. Requirements documents can also be used by the product launch team to plan a formal release, including the development of sales collateral, marketing plans, customer service training materials and FAQs, pricing analysis, and more.

You may be wondering how the hybrid approach differs from the waterfall approach, since requirements are defined up front in both processes. The key difference is that agile provides a forum for and sets the expectation that the development team will notify the product owner and scrum master if they run into an issue that may require design changes. The design team can then make a decision in a timely fashion, and the development team can keep working. This approach encourages developers to be collaborators, not order-takers. Since development is be-

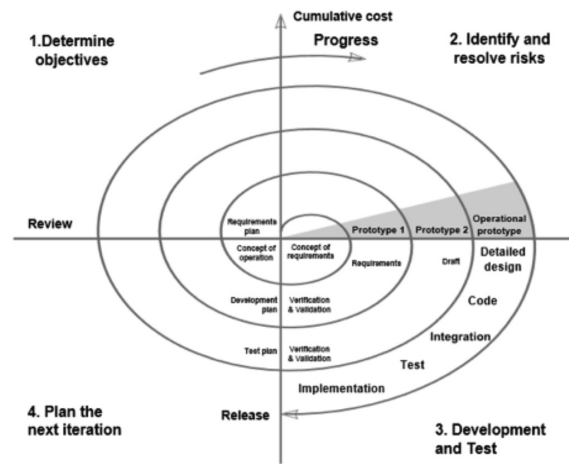
ing done in smaller chunks, this also means that if the business area needs to change requirements due to regulatory or market changes, it should cause less of a delay.

The spiral model (Figure 3) is an example of a hybrid design that follows many characteristics (prototypes, experiments, and solutions) of a pure agile development methodology. Iterations follow four key phases that are designed to identify and mitigate risks:

1. Determine the objectives and plan the scope of the increment
2. Prototyping, experimentation and research to identify and resolve potential risks (technical, conceptual, etc.)
3. Design, develop and test the increment
4. Release and monitor the increment, and use feedback to aid in planning the next iteration

Another approach is the iterative and incremental model (Figure 4). This is any combination of iterative design that attempts to address the main criticisms of the waterfall approach, since the entire project is broken down into smaller increments that apply lessons learned from previous iterations.

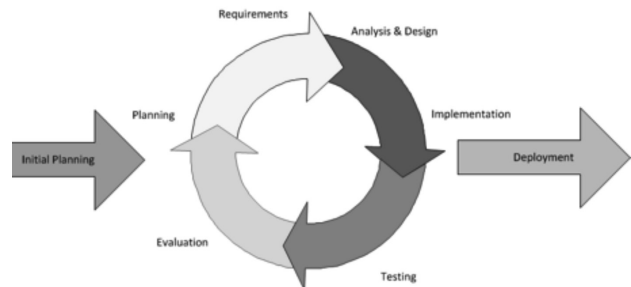
Figure 3. Diagram of Spiral Model



Source: Inflecta Corporation, Silver Spring, MD

Learning is continuous, allowing the application to evolve incrementally upon the completion of each iteration. Although this model looks very similar to agile development, there are several

Figure 4. Diagram of Iterative / Incremental Model



Source: Inflecta Corporation, – Silver Spring, MD

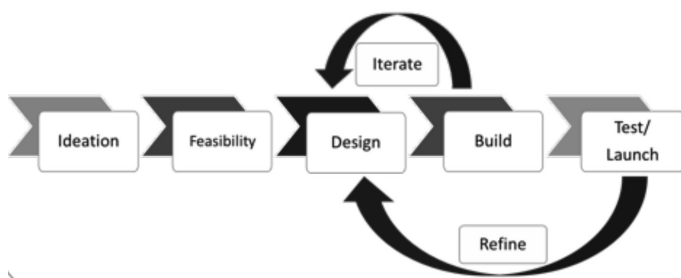
key differences. Iterative development typically follows the same waterfall steps, they just occur in smaller units of time and do not have to be released upon completion of each iteration.

HOW DOES THIS APPLY TO INSURANCE PRODUCTS?

Most insurance companies are already using an agile approach in their IT areas, whereas the broader product development process is still a waterfall. Business requirements and specifications are locked down at the end of design and handed off to IT. IT then develops the technical specifications and builds the system functionality to support the business needs. In a pure waterfall approach, IT would blindly build to business specifications, without considerations of how design decisions impact difficulty or cost (“just do it”). This is suboptimal in a limited resource environment. Most companies have someone from IT participate in the design phase, but unless this person is very knowledgeable about how both the business and the system work, it can be challenging for them to be very effective. Unforeseen issues often pop up during the build phase, resulting in “rework” and slower speed to market. Unanticipated issues can also surface in compliance, actuarial, etc. While each member of the design team does their best to anticipate these issues up front, it is only natural that additional information will come out once the work is actually being done. The pressure to lock down specs and avoid rework makes the team feel like everything must be perfect coming out of design. In addition, because the entire process is so labor-intensive and takes so long from ideation to launch, sales also feels pressure to design the optimal product. This all results in analysis paralysis and reluctance to commit to decisions.

How can companies do better? One approach is to build iteration into the process (Figure 5). What looked like rework in the past now looks like ongoing design refinement. Using an iterative design and build process should reduce the pressure to hit a home run with the first set of specs. Speed to market may improve because the initial ideation through design phases are shorter, with opportunity to cycle back and make changes.

Figure 5. Diagram of Iterative Product Process



What does this look like in practice? Company X designs products by holding meetings with large groups of people (everybody wants to weigh in because they only get one chance) where design decisions such as issue ages are discussed. This process takes a long time and consumes a lot of resources.

Instead, only key decisions that affect all workstreams should be made at that stage of the process. For example, what underwriting data will be captured? Teams can then go off and work with this information.

- Actuarial can develop a mortality assumption tied to the data elements and produce pricing results.
- Underwriting can determine the best way to capture the data: application, database queries, teleunderwriting, etc.
- Compliance can draft the application.
- Systems and operations can begin their work.

As questions arise during this process, daily stand-up meetings provide the opportunity to raise questions that need input from the other areas. For example, systems and operations will need to know which databases are going to be queried so they can build in connections. The team members should be empowered to make most decisions, with the product owner responsible for deciding which issues need to be elevated to a management level (e.g., if systems identifies that working with a certain database will be much more expensive than the budget identified in the high-level cost-benefit analysis). While that decision is being made by management, other work can continue.

This is just one example. The important idea here is to only make decisions at the point in time in which they must be made in order to move forward, and to empower development teams to make most decisions. By using a collaborative and iterative process, it is less likely that showstoppers will surface late in the process without other areas being aware of the issue.

Why aren't companies using this model already? A key reason is that many of the business areas that participate in the product development process have other responsibilities as well, and their contribution to a given portion of the build may only be a day or two. Using mini sprints can help with this. Even if product resources are not dedicated, there can still be the expectation that during the mini sprint, team members are accessible and focused on their product work.

One of the challenges in using iterative development for insurance products is that it can be more difficult to do incremental releases than in the IT space. Launching a new product requires significant distribution training time. Agents can be slow to add

new products to their quiver if they are already successful, and if they look at a product once and find it unsatisfactory, they might not give it a second chance. Therefore, if a company launches a product to its sales force, they want it to be something that they know will sell. This can be mitigated by soliciting agent and/or customer feedback in every step of the product process, but feedback from advisory councils and focus groups does not always capture what the actual market experience will be. This is where carriers that use direct marketing have an advantage — they can develop a product testing program that is only visible internally. This opens the door to an iterative design process that also takes into account the results of market testing. Carriers with traditional distribution also have the opportunity to pilot products in limited production. Testing can appear to lengthen speed to market since it adds an additional step to the process, but the hope is that the initial design phase is shorter since the goal is to develop a prototype, not the final product.

CONCLUSION

Agile methodology is taking the IT world by storm since it mitigates a lot of the issues that organizations experienced when using the waterfall process. That said, it is not a panacea because it can take too much design control away from the product owner. Hybrid agile approaches aim to bridge the gap. While a full-blown move to agile may not work for the broader insurance product development process, using an iterative approach can help companies avoid analysis paralysis and get to the build phase faster.



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Actuarial Guideline 49 Update

By Donna Megregian

Third quarter 2015 sales for Indexed Universal Life (IUL) continue to increase according to LIMRA Research. It has yet to be determined how Actuarial Guideline 49 (AG49) will impact IUL sales since the first part of AG49 only went into effect Sept. 1, 2015, thus impacting one month of the third quarter. In the last edition of *Product Matters!*, we walked through each section of the guideline, and posed a few pop quiz questions. Here we will attempt to answer those questions and give an update on issues surrounding illustrations being addressed by the industry.

POP QUIZ ANSWERS

Since Sept. 1, companies have to comply with Sections 4 and 5 of AG 49, requiring the use of a more prescriptive maximum illustrated rate and assumed earned rate underlying the disciplined current scale (DCS). The first pop quiz question asked “You have an indexed account with a 1 percent floor and a current cap of 11 percent. How would you apply AG 49 to determine your maximum illustrated credited rate?” The answer is it depends. The Practice Note Addendum published by the American Academy of Actuaries (<http://www.actuary.org/content/iwg-releases-addendum-practice-note-naic-life-insurance-illustrations-model-regulation>) can be referenced for help. Examples 2 and 3 of Question 4 of this addendum illustrate what could be done based on the presence of an index account that meets the definition of the benchmark index account or not.

The second part of AG 49 (Sections 6 and 7) will be required starting in March of 2016. The second pop quiz question asked “I have a variable loan rate that is currently projecting 5 percent, and my benchmark index account is calculated to credit 7 percent. What values can I show in my illustration?” Question 13 of the Practice Note Addendum addresses this issue by considering the type of loan—in this case variable rather than fixed—and indicates it may be reasonable to either increase the loan rate to be within 1 percent of the maximum illustrated rate or decrease the maximum illustrated rate to be within 1 percent of the loan rate. At the October 2015 SOA Annual Meeting & Exhibit, there was an AG 49 workshop that asked this same question. Most of the responses with a definitive answer (i.e., excluding don’t know

or not applicable) indicated they plan to decrease the maximum illustrated rate.

GENERAL ILLUSTRATION UPDATE

The activity around AG 49, the Life Illustration Model Regulation (The Model) and Actuarial Standard of Practice 24 (ASOP 24), is still ongoing at the National Association of Insurance Commissioners (NAIC). Proposed language changes to AG 49 have been exposed to accommodate indexed products with account charges that buy up the index cap. At the time this article was written, the draft changes are still being worked on.

The Life and Annuities (A) Committee of the NAIC decided to establish a new working group to explore how the narrative summary (Section 7B of Model #582) and the policy summary (Model #580) can be enhanced to promote consumer readability and understanding, including how they are designed, formatted, and accessed by consumers. The working group will provide a report with recommendations to the committee by the 2016 summer meeting. This does not mean that The Model will be opened, and many considerations must be given to opening and not opening The Model.

There is a tremendous amount of collaboration and effort required of many organizations and groups to work through the issues related to IUL and other illustrated products. There is no easy fix and we look forward to the developments related to illustrations as they continue to move through the vetting process.

The opinions in this article are those of the author and are not representative of RGA, the Society of Actuaries or the American Academy of Actuaries.



Donna Megregian, FSA, MAAA, is vice president & actuary at RGA in Chesterfield, Mo. She can be reached at dmegregian@rgare.com.

2015 Election Results

By Brock Robbins

The results of the SOA's most recent elections have been processed, and we are happy to welcome some new faces to the Product Development Section. Of course, we also will miss the familiar faces of those members whose terms have expired: Joe Kordovi, Vera Ljucovic and Donna Megregian. On behalf of the Product Development Section, I extend my heartfelt appreciation to each of them for their service. We are especially grateful to the leadership of Jim Filmore, who steps down as section chair.

Jeremy Bill (Chair), Simpa Baiye, Paul Fedchak, Ken Lombardo and Kelly Rabin (Vice Chair) remain the backbone of the section and will serve as the glue to bring old and new together. We all are grateful for their continued commitment to our profession and the SOA.

As section members step down, new faces (at least for this group) arise. We are fortunate to have a number of exceptional actuaries step up and help fill the knowledge gap left by the departing council members. Our challenge remains to receive what past members have given us and to continue building on those successes for the betterment of our profession.

I am sure that—by name, face or reputation—the new section council members are already familiar to many of you. However, below is a brief introduction of each new member of the Product Development Section.

NANCY BROPHY, FSA, FCIA

Nancy is director of the Global Actuarial Consulting Group at Munich Re in Toronto, Canada. Her primary responsibility is to provide actuarial consulting services to Munich Re's global life offices, with a strong focus on North America. This includes actuarial support for pricing, valuation, reporting, modeling, in-force management, underwriting and process improvements. Nancy began her career in reinsurance pricing and product development in the Canadian individual insurance market for life and living benefits.

She has been quite active in the SOA, having served as a member on numerous committees focused on reinsurance and exam review. She became an FSA in 2013 and an FCIA in 2014.

MING FEI, FSA, MAAA

Ming Fei is associate director at AIG Life and Retirement, based in California. His specializations include work in financial reporting, product pricing and risk management. Ming earned his master's degree and became an FSA in 2009.

In addition to his commitment to the Product Development Section, Ming also serves on the Financial Reporting Section.

LINDSEY MEISINGER, FSA, MAAA

Lindsey is an associate actuary in RGA's Global Research and Development team, where she is responsible for U.S. internal and external experience studies, including final expense, conversion business, and client-specific studies. She joined RGA from AIG in 2011 as part of U.S. Individual Health and worked on long-term care pricing solutions. Lindsey also served an assignment in RGA's Paris office before assuming her current position in 2014. Lindsey is a graduate of the University of Illinois at Urbana-Champaign, a fellow of the Society of Actuaries, a member of the American Academy of Actuaries and the St. Louis Actuaries Club.

Lindsey has already left her mark on the SOA, co-authoring the *2015 Report on the Survey of Conversion Assumption and Product Features for Level Premium Term Plans* and presenting at SOA events.

BROCK ROBBINS, FSA, MAAA

I recently was named as executive vice president and head of the U.S. market for SCOR Global Life, and am in transition from my prior responsibilities as senior vice president and chief pricing officer. I have served in a number of pricing and valuation roles both with direct companies and reinsurers, in both Canada and the United States. I am a native of Canada and graduated from the University of Waterloo. I earned my FSA in 1994.

I have presented frequently at SOA meetings, especially at the SOA annual meetings, and have assisted in exam grading and question writing over the years.

Please join me in welcoming everyone to their new roles on the Product Development Section Council!



Brock Robbins, FSA, MAAA, is executive vice president and head of U.S. market at SCOR Global Life in Charlotte, N.C. He can be reached at brobbs@scor.com.



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