

Product Matters!

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Comments from the Incoming Editors

by Ken Joyce and Dominique Lebel

This is our first issue as your new *Product Matters!* editors and we are excited to begin this new journey. Let's begin by taking a moment to recognize Doug Doll's outstanding work as your editor over the last three and a half years. Doug served in a solo capacity and he did so with great dedication and enthusiasm. Thanks, Doug, for all of your hard work and contributions to the newsletter. We also appreciate your support during our transition.

The advent of principles-based approaches to reserves and capital will no doubt impact product development actuaries in ways not yet known. This development in itself is a fantastic opportunity for actuaries. How products are priced and designed under principles-based approaches will of course require strong technical skills, but equally important, it will require exceptional communication skills to tell this story to senior management and other non-actuarial leaders. What a great time to be an actuary!

Looking ahead, we hope to achieve the following with this newsletter:

- Wide range of articles covering life and annuity pricing and product development, and Product Development Section activities.
- Articles that focus on the U.S., Canadian and international markets.
- A promise to listen to your suggestions for improvement.

So, we hope you enjoy our first issue as your new editors. We look forward to hearing your feedback as well as your participation in submitting innovative product development articles. Thank you in advance for your support and loyal readership! □



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Contents

- 1 Comments from the Incoming Editors
 - *Ken Joyce and Dominique Lebel*
- 3 Incorporating Dynamic Policyholder Behavior
 Assumptions into Pricing of Variable Annuities
 - *Rebecca Scotchie*
- 8 New Combination Products—Menus
 of Choice
 - *Carl Friedrich*
- 10 NAIC June 2006: Principles-Based
 Approaches Take Front and Center
 - *Donna R. Claire*
- 13 The Response of Life Insurance Pricing to
 Life Settlements
 - *Daniel Theodore*
- 19 Inflation-Indexed Income Annuities: Pricing
 Considerations and Investment Strategies
 - *Simpa Baiye*
- 22 2004 Inter-Company Expense Study of U.S.
 Individual Life Insurance and Annuities
 - *Steven Siegel*
- 24 2006 SOA Annual Meeting in Chicago

Incorporating Dynamic Policyholder Behavior Assumptions into Pricing of Variable Annuities

by Rebecca Scotchie

During the early 1990s, variable annuities (VAs) were considered to be relatively simple products and were priced using simple deterministic methods. Guaranteed minimum death benefits (GMDBs) were built into the contract, often limited to return of premium, with a cost that was covered by the mortality and expense charge. Over time, companies have added a variety of special features to VA products, such as enhanced GMDBs and a variety of living benefits, including guaranteed minimum income, accumulation and withdrawal benefits (GMIBs, GMABs, and GMWBs). As features have evolved, so too has pricing of VAs.

Evolution From Deterministic To Stochastic Methods

Deterministic methods continue to be used today, but there has been a shift toward stochastic methods. For the simplest deterministic pricing method, an estimate of a VA rider cost as a percent of account value (AV) is fed into a deterministic pricing run as an additional expense.

Deterministic methods do not show the significant variability of account value, fee income and net amount at risk. Stochastic pricing, which involves a full projection across a large number of stochastic scenarios, has evolved to capture this variability. A key aspect of the variability is policyholder behavior linked to net amount at risk and movements in account value, which is, in turn, linked to economic environment. Stochastic methods are further evolving to incorporate nested stochastic processes to capture principles-based reserves and capital.

Pricing variability is assessed across a set of stochastic scenarios, parameterized to represent the expected economic environment. Typically, real world scenarios are used. However, increasingly, as pricing assumes hedging will be implemented, risk neutral scenarios are being used. With real world



scenarios, the mean, range or specified percentiles of pricing measures are viewed to understand the potential effect on value. As a secondary measure, conditional tail expectation (CTE) results are often analyzed (e.g., pricing results are sought such that the CTE (95) IRR is no worse than the earned rate). With risk neutral scenarios, the focus is only on the mean result. Regardless of which types of scenarios are used, stochastic projections incorporate behavioral functions, based on the in-the-moneyness of the benefits, which are used to estimate the utilization of the benefit.

The effect that policyholder behavior has on results can be quite significant; a few examples of policyholder behavior linked to economic environment include:

- For policies with GMIBs, the level of net amount at risk (NAR) could have an effect on the annuitization decision.
- Before lapsing a policy, policyholders are likely to consider the richness (or lack thereof) of their benefit guarantees.

continued on page 4

- Dollar-for-dollar provisions and movement of AV relative to a GMWB might alter withdrawal decisions.
- Reset activity could be driven by the market.

As illustrated later in Exhibit 1, stochastic pricing results across a set of 1,000 real world scenarios, including functions to reflect policyholder behavior, demonstrate a range of potential results, which are often asymmetrical with a steep tail. A deterministic result, in contrast, completely overlooks the potential range.

Which Policyholder Behavior Functions Should Be Used?

Which behavioral functions are appropriate to use? Unfortunately, experience is limited. The vast majority of GMIBs are just coming out of waiting periods. GMABs and GMWBs are newer; some partial withdrawal experience exists for the latter, but it is limited. The Society of Actuaries' Policyholder Behavior in the Tail Risk Management Section Working Group completed a survey (Variable Annuity Guaranteed Survey Results), which can be found at <http://www.soa.org/ccm/content/areas-of-practice/finance/research/policyholder-behavior-in-the-tail-survey-results/>. That survey serves as a good general resource providing analysis and examples of what is used in the industry. It provides a qualitative discussion of dynamic lapses, GMIB utilization and GMWB utilization. Charts are provided that show various assumptions used in tail scenarios. One thing that is clear from the survey is that actuaries have different perspectives on how policyholders will behave under different circumstances. The working group's mission is to examine and ultimately give guidance to actuaries on how to set assumptions in extreme scenarios.

Pricing actuaries are charged with using good judgment and the experience and resources they have available to develop policyholder behavior functions that represent how they think policyholders will behave.

Differences in behavior—retail versus institutional—must be considered. Policyholders exhibiting retail behavior do not necessarily operate in a manner consistent with a rational investor. Also, the effect a policyholder's agent or advisor will have on his behavior must be considered. Policyholders exhibiting institutional behavior act in a fully efficient manner. It is for these types of policyholders that risk of anti-selection is the highest. If a secondary market for variable annuities were substantially formed, there would be growth in the number of policyholders exhibiting institutional behavior. Regardless of behavior, it is reasonable to expect that policyholders paying extra for a benefit are more aware of what they have purchased than those policyholders for whom benefits are built into their policies.

Pricing actuaries are charged with using good judgment and the experience and resources they have available to develop policyholder behavior functions that represent how they think policyholders will behave. Materiality should be considered; there is no need to develop elaborate policyholder behavior functions when there is no significant effect on results. As experience evolves, general behavior functions will begin to take shape.

The following sections provide considerations for and drivers of dynamic policyholder behavior functions.

GMIB Annuitization

GMIB utilization (a.k.a. annuitization) is a very interesting assumption. During the waiting period, no annuitizations (or a very low level like 1 percent) would be expected. It would not be reasonable to expect that many policyholders would pay for an option and then exercise it before the option has value. As in-the-moneyness increases, annuitization increases. Net amount at risk is a function of the level of annuity payments that can be purchased by the GMIB amount using guaranteed purchase rates to the level of annuity payments that can be purchased by the account value using current purchase

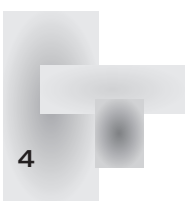


Exhibit 1

rates. The actual GMIB balance can be greater than the account value without the policy actually being in the money. The function could also have a component considering age. For example, is different behavior (increased annuitization) around retirement age or soon after retirement age expected? Other considerations include the shape of the function—should it be linear or exponential? Should a maximum or minimum rate be considered?

Exhibit 1 shows the difference in the present value of annuitization claims in excess of account value less the present value of GMIB fees collected, as a percentage of account value, with and without a simplistic GMIB utilization formula for a typical GMIB. The GMIB provides for a combination 5 percent rollup/annual ratchet and is effective after a ten-year waiting period. For the projection without a dynamic utilization function, 0 percent annuitizations per year were assumed during the waiting period and 5 percent annuitizations per year were assumed after the waiting period. For the other projection, the dynamic utilization function is:

Annual annuitization rate = Maximum (0, Minimum (50 percent, NAR / AV))

As demonstrated in Exhibit 1, incorporating dynamic annuitization behavior assumptions increases the range of potential results.

Lapse

The lapse assumption can be affected by the relationship of the guarantee to the account value. However, a dynamic lapse formula is not often used for death benefits, possibly because the alternative to lapsing (utilizing the benefit) is not under the policyholder's control. The dynamic formula can replace the base lapse rate or can be applied to the base lapse assumption. Regardless of the approach, the relationship between the lapse rate and the surrender charge schedule should be retained. Generally, as in-the-moneyness increases, lapse rates decrease. It is not yet clear whether the strength of this relationship varies by benefit type. Also, special considerations should be made for

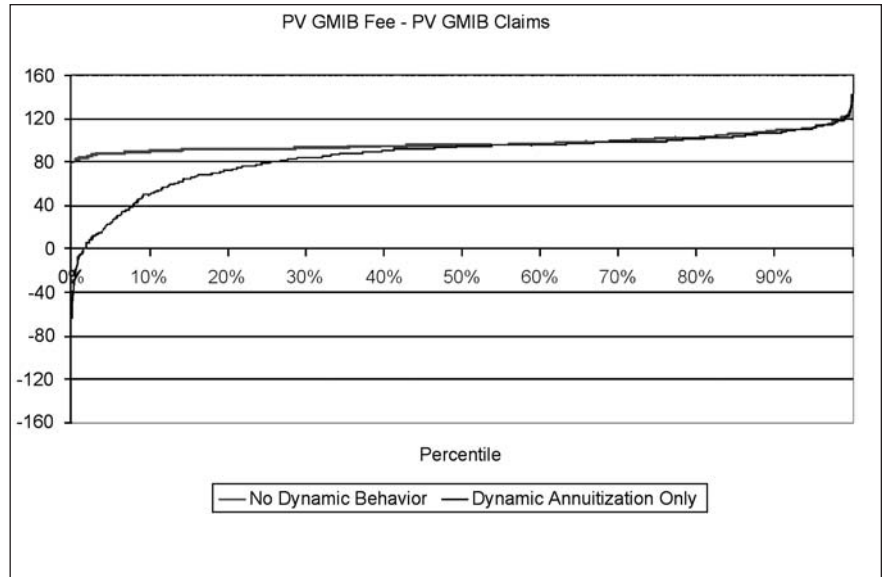
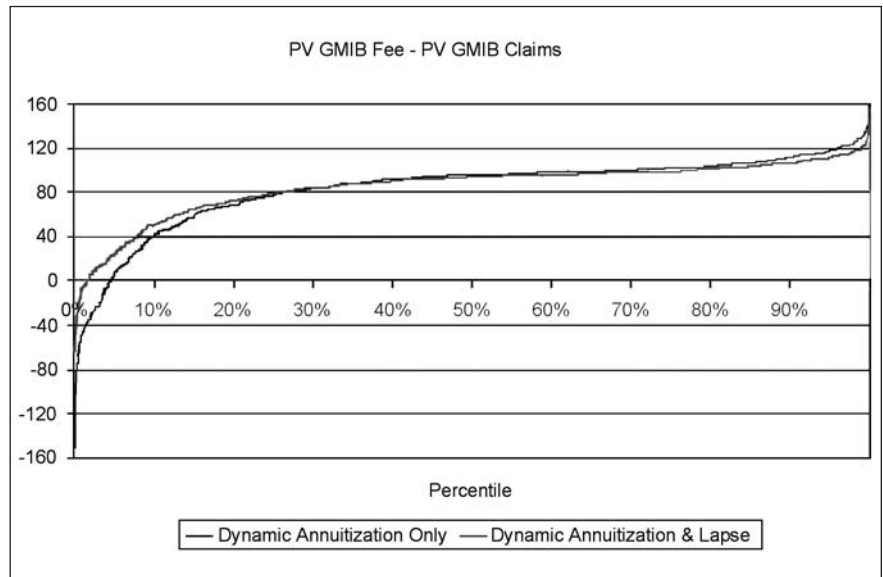


Exhibit 2



continued on page 6

GMIB (net amount at risk is a function of annuity factors) and GMAB (at time periods well prior to the GMAB payment date, how best can in-the-moneyness be measured?). Attained age is not used often in dynamic lapse formulas. The function can be either one-sided--decreasing the lapse rate when in the money, or two-sided--applying a factor to increase lapse rates when out of the money. The formula can be continuous or discrete. One final consideration is a contrarian argument, which says that lapse rates may increase when a policy becomes severely in the money, due to the policyholder "cutting and running." However, this argument seems less plausible for living benefits.

Exhibit 2 on page 5 demonstrates GMIB results with and without a simplistic dynamic lapse utilization formula. Both projections assumed the same dynamic utilization formula as shown in Exhibit 1. For the projection with the dynamic lapse formula, the base lapse rate is multiplied by the following factor:

Lapse factor = Maximum (50 percent, Minimum (100 percent, 200 percent - GMIB / AV))

As with Exhibit 1, Exhibit 2 shows that incorporating dynamic lapse behavior assumptions further increases the range of potential results.

Partial Withdrawal

For policies with GMWBs, dynamic partial withdrawal functions vary by cohort and consider in-the-moneyness. Splitting the business into cohorts and applying a separate formula to each cohort, rather than applying a single formula to all business, is becoming reasonably common in the industry. Cohorts allow for separation of business into the different reasons policyholders may take withdrawals. For example, some policyholders may have purchased the annuity simply to provide income (either immediately or at retirement age). Others' withdrawal behavior may only be affected by the economic environment. An example of using cohorts on a GMWB with a 7 percent

withdrawal benefit would be to divide the business into the following:

- Cohort A. Never withdraw.
- Cohort B. 7-percent annual withdrawals begin at retirement age.
- Cohort C. 7-percent annual withdrawals begin at time 0.
- Cohort D. As in-the-moneyness increases, partial withdrawal rate increases up to a maximum of 7-percent per year.

In this example, pricing cells would be tagged with the cohort indicator. Common approaches for Cohort D involve use of a trigger (full utilization begins once a certain threshold is crossed) or scale (withdrawal rate increases as in-the-moneyness increases). Also, other contractual policy features or benefit designs may require additional consideration. For example, greater and earlier utilization might be expected for benefits that allow lifetime partial withdrawals.

Another feature of VAs that affects partial withdrawal behavior would be the existence of dollar-for-dollar reduction of the guaranteed benefit upon withdrawal. It allows the benefit amount to be reduced by the amount of the account value withdrawn (as opposed to reducing the benefit amount by the same proportion as the reduction to account value). In today's VA designs, this feature is significantly limited. For example, perhaps only 5 percent of account value can be withdrawn on a dollar-for-dollar basis, while the remainder is subject to proportionate withdrawal. As in-the-moneyness increases, withdrawal activity should increase, even if only to the dollar-for-dollar withdrawal threshold. Unfortunately, the experience on this is difficult to examine. Some believe that the activity is greater for larger policies, with agents who are potentially more attentive.

**Incorporating
dynamic lapse
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Reset Activity

Some VA policies allow for reset of a benefit amount to the account value, if higher, at a certain point in time. If resets are automatic, then dynamic behavior need not be considered. Otherwise, the driver of reset behavior is an increase in account value relative to the benefit, but the downside must be considered. For example, increasing the period at which the benefit payment is made might be a disincentive to reset. Inertia, or disinterest in calling up the insurance company to enact reset, may prevent selection of it even though it otherwise makes economic sense. Sophistication and relationship of the agent or policyholder are other considerations.

Transfer Activity

Some VA policies require investment in one of a number of fund allocation mixes, between which policyholders can alternate. Other policies allow for automatic rebalancing or for other transfer activity. The economic environment is clearly a driver of transfer activity. When the market is down, some policyholders have a tendency to move to more conservative funds, thus locking in their loss. Often policyholders have a particular threshold that must be reached before they will transfer funds. Limitations of the policy must also be considered.

Policyholder Behavior in Development of Principles-Based Reserves and Capital

Consideration of principles-based reserves and capital are a reality. Their development is an independent stochastic exercise and requires prudent best estimate assumptions and, hence, consideration for dynamic behavior. Capturing principles-based reserves and capital in a pricing projection could be a nested stochastic exercise. At the end of each period in which reserves or capital need to be accurately measured, nested projections are needed.

Time will tell what standard activity will evolve for the nested projections:

- Full-blown nested processing

- Representative scenarios
- Approximation techniques

Regardless, the nested calculations, by which reserves and capital are calculated, need to reflect dynamic policyholder behavior functions, as in the base projection, but with prudent conservatism.

Summary

Incorporating policyholder behavior into pricing of variable annuities can be challenging. Product evolution has resulted in the need to reflect policyholder behavior in order to capture the real picture of risk. Functions should be developed based on common sense, experience and existing resources and should be tested for reasonableness. The passage of time will result in standard industry practices. □



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Features

New Combination Products—Menus of Choice

by Carl Friedrich



Fifteen years ago, an issue of the *National Underwriter* featured a discussion of combination life/long-term care products that were just beginning to be offered in the industry. The most common versions of these products featured long-term care riders attached to universal life policies. These riders were structured to accelerate death benefits in the event of specified triggers related to long-term care needs, typically with monthly benefit payments during the period of care. The cost to the insurer of accelerating death benefits was very modest, since future death benefits were reduced dollar for dollar under this recipe for insurance. In addition, a portion of the accelerated payout in reality was taken from the cash value of the contract, which was typically available to the policyowner in any event.

In contrast to these low-cost riders, which essentially included a form of self-insurance, the column referenced above discussed an alternative design. That approach featured long-term care benefits which were independent of the underlying life insurance policy, with long-term care insurance benefits having no effect on future cash values or death benefits payable under the base life policy. Proponents of this structure argued that life insurance needs did not necessarily decrease with the need for long-term care services. Further, it was noted that in many cases the accelerated benefit designs fell short of providing comprehensive long-term care coverage, particularly for smaller life contract face amounts. The independent benefit design didn't offer meaningful savings versus costs of a stand-alone long-term care policy, in contrast to accelerated benefits, but the two approaches both served to fund the cost of long-term care insurance through a flexible premium, tax deferred accumulation vehicle.

So what impact have these products had in the market over the last 15 years? A few companies who have focused on these innovative combinations have had considerable success, but they have represented a small portion of the overall long-term care insurance market. There are several factors that point to changes in that position.

The first key factor is the convergence of these two different designs. Companies specializing in these markets in the last few years have recognized the strengths and weaknesses of each approach, and have put together combinations that include a menu of choices from both structures. For example, a life base-plan may be offered with a selection of a 24-month or 36-month long-term care insurance payout of the full death benefit, with some residual death benefit preserved to address the needs of the life insurance beneficiary. In addition, an independent long-term care rider may also be

attached to the same policy, extending the long-term care coverage beyond the 24 or 36 month period for another range of months as selected by the policyowner. Further, these combinations frequently offer inflation benefits, nonforfeiture benefits, and other features that are standard in the long-term care insurance marketplace.

A second key factor that affects the outlook for the future is that the number of long-term care insurers has shrunk considerably in the last five years, despite the growing needs of this under-served market. Many companies who are not yet comfortable with the risks of stand-alone long-term care insurance are exploring various flavors of products that reduce those risks to the insurer, via death benefit offsets in accelerated benefit features, or via the use of long elimination periods inherent in independent long-term care riders. Several other companies are intent on pursuing this marketplace, and are actively considering products that in some cases extend beyond life and long-term care insurance.

Third, advances in underwriting are allowing companies to become more comfortable with some of these exposures. In particular, cognitive assessment screens are becoming more sophisticated and streamlined. Cognitive tests that can be effectively administered over the telephone with a high level of accuracy, both in terms of detecting early stages of impairment and not signaling false positive results, are being utilized. This can be particularly important in the distribution of combination products.

Finally, premiums for new stand-alone long-term care coverage have increased due to low market interest rates, high persistency and regulatory requirements. As a result, producers are recognizing the need for more affordable forms of long-term care insurance. Financial planners and banks are

also increasingly recognizing the importance of addressing long-term care needs. Many are finding these new combination products appealing as they advise their clients to reposition their assets into these vehicles, providing a three-course serving of benefits including cash values, life insurance and long-term care insurance.

As we look ahead, it will be interesting to see what new product developments emerge in the area of combination products. There are efforts in Congress to clarify and enhance the tax treatment of life and annuity policies combined with long-term care. Even with some open questions regarding tax treatment of some of these designs, we expect companies to continue to move to meet the appetites and needs of consumers. If clarifying tax legislation advances, we expect that an even broader menu of combination plans would emerge, to the benefit of the insurers, distributors and consumers. □



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NAIC June 2006: Principles-Based Approaches Take Front and Center

by Donna R. Claire



The June 2006 NAIC meeting was held in Washington, D.C. The weather in our nation's capital generally cooperated to make the few times one was not in meetings pleasant. In general, like the March meeting, most of the Life and Health Actuarial Task Force (LHATF) time was spent on the Principles-Based Approach (PBA) initiatives. These principles-based initiatives are important to product development actuaries because the level of reserves and capital affects product pricing.

Life Reserve Working Group

Dave Neve and Tom Kalmbach gave the Academy's Life Reserve Working Group (LRWG) presentation. One major accomplishment was that a new draft of the regulation was exposed for comments. The LRWG also sought and received input on several other issues from LHATF. For example, LHATF told the LRWG to work on defining margins (reserves are based on

prudent best estimate assumptions with margins) in terms of defining what to consider when setting a margin (e.g., amount of experience, volatility of assumptions, etc.), versus either leaving it entirely up to the actuary or coming up with specific margins for all assumptions. LHATF also expressed a preference for stochastic reserves to be calculated in terms of greatest present value of accumulated deficiencies, while possibly doing deterministic reserves in terms of gross premium valuation. The LRWG still expects that they will have final regulations and actuarial guidelines ready for adoption by December of 2006, with potential state rollout of the PBA in 2007. LHATF also determined that, at the beginning, the PBA will be applied prospectively for reserves, with one regulator mentioning adoption for April 2007—the date that the current compromise on the Actuarial Guideline 38 for term reserving is set to expire. It is also potentially possible that the PBA may be applied retroactively once more experience is gained on this.

Note: on a related issue, there was a straw poll taken after a webcast on this subject. There were about 200 weblines (about 1000 attendees) that responded:

1. Which of the following best describes your company's state of preparedness for the implementation of life insurance principles-based reserves?

- a. Have not reviewed or taken significant steps to-date (16%)
- b. Reviewed and waiting for additional progress (46%)
- c. Reviewed and planning next steps (9%)

- d. Taken specific actions toward implementation (2%)
- No answer (26%)

2. Which of the following best describes your company’s state of preparedness for the product development of life insurance principles-based reserves?

- a. Have not reviewed or taken significant steps to-date (37%)
- b. Reviewed and waiting for additional progress (25%)
- c. Reviewed and planning next steps (4%)
- d. Taken specific actions toward implementation (4%)
- No answer (30%)

work of the Consistency Group, which first developed the basic principles to be used for all the Academy work on PBA, and is now developing a glossary to ensure consistent definitions on items such as “prudent best estimate” are used through all the Academy projects. Jim Lamson gave an update on work on the Annuity Reserve Work Group. Sheldon Summers gave an update on the Reinsurance Work Group, which is making sure that reinsurance is considered in all elements of the PBA. Nancy Bennett gave an update on the Stochastic Scenario Models and the C-3 Phase 3 work to support the PBA. Larry Gorski gave an update on the Economic Scenarios Work Group, which is developing interest rate and equity scenarios to be used in PBA work. Shirley Shao and I gave an update on the peer review and governance work needed to support the PBA. The major take-aways—there is a lot of work being done, and we are still on track to be

It does appear that more is being done on the reserves than the product side—but there are some companies who are actively preparing for this PBA world!

LHATF also expressed a preference for stochastic reserves to be calculated in terms of greatest present value of accumulated deficiencies.

Standard Valuation Law Update/Principles-Based Approach

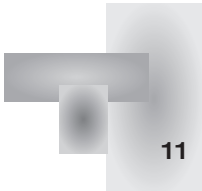
There were several Academy presentations at the NAIC meeting. There was a presentation at LHATF. In addition, there were two separate meetings sponsored by the Academy to bring the regulators up to speed on the work on parts of the Standard Valuation Law update/Principles-Based Approach (SVL2/PBA) project. Examples of different projects currently being worked on are: Bob DiRico updated LHATF on the

done by December of 2006. Further information on these projects can be found at www.actuary.org/risk.asp.

SVL2—LHATF Subgroup

Larry Bruning of Kansas heads a LHATF working group that is working on a revision to the Standard Valuation Law. Mike Boerner of the Texas Department had developed a draft law, as did the ACLI. It is expected the two documents will be combined where reasonable, and the differences noted where there is no meeting of the minds.

continued on page 12



PBA—Commissioners' Work Group

A new group was formed at the commissioner level on PBA. This group, chaired by the commissioners in charge of the A (Life) and E (Financial) Committees of the NAIC, had a kick-off meeting on June 12. This group is tasked with getting a PBA system shepherded through the various NAIC Committees and Task Forces (e.g., Statutory Accounting, which will need some changes.)

International Issues

At LHATF and at other NAIC meetings, there was discussion of international reserve and solvency issues. The Academy is actively working with these International groups, such as the International Actuarial Association. The PBA is going in a similar direction as the international groups.

Preferred Mortality

Larry Gorski gave the update on this joint SOA/Academy/Regulator project. They are still on track to have the experience tables completed by the fall of 2006, with delivery of all items (including preferred mortality tables/factors) by the spring of 2007. It is also anticipated that these same tables could be used as interim tables if the PBA is not adopted by all states in 2007.

ACLI Proposal

The ACLI presented a proposed interim solution to the "AG38" (the term reserves and UL shadow account actuarial guideline) problem. It involves a different mortality table than the mortality table the SOA/Academy/Regulator mortality work mentioned above, plus re-opening AG38 for some changes, such as adding lapses to the deficiency reserve piece. LHATF exposed the latest ACLI proposal for comment. There will be a LHATF conference call on this in a month or so.

VA-CARVM

LHATF discussed and voted on various changes to the proposed actuarial guideline, including switching to a December 31, 2007 effective date. They exposed the "New York"

version for comment. The New York version has the CTE level at 75 percent. It also limits reflection of revenue sharing to that guaranteed in contracts. It also contains a requirement that the cost of the options to hedge the risk should be considered a floor. The hope of regulators is that these issues can be adopted at the September 2006 LHATF meeting.

RBC Issues

The NAIC's Life Capital Adequacy group voted to make C-3 Phase 1 apply to all companies over \$100 million. This change will be effective for year-end 2006. There are some changes to the instructions on C-3 Phase 2. This group also heard about the C-3 Phase 3 project to bring a PBA to RBC for all products, including in-force.

Summary

The PBA has become the major topic of LHATF, and it is being discussed in many other NAIC committees as well. In the next update to Product Matters!, I hope to report substantial progress in having the PBA come closer to reality. □



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The Response of Life Insurance Pricing to Life Settlements

by Daniel Theodore

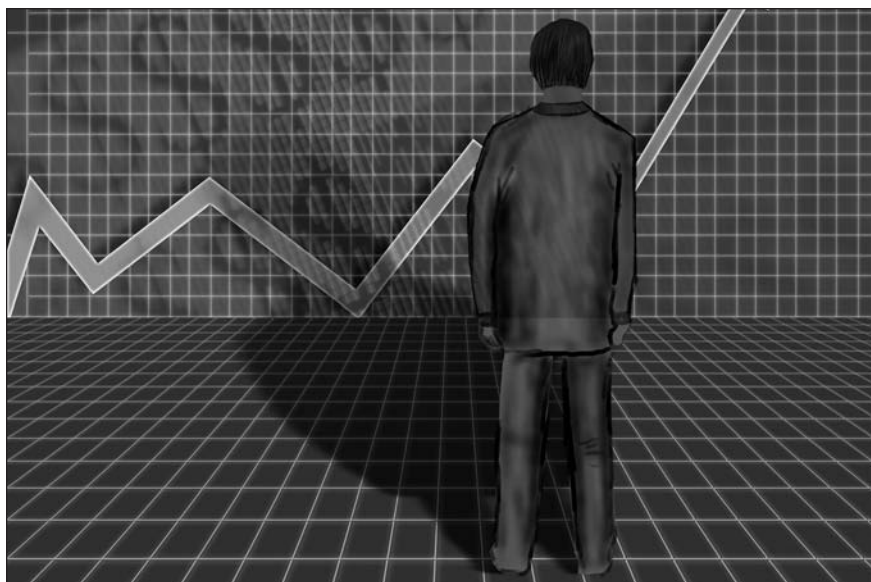
This article is intended to cover various observations and theories about the life settlement market, how it is affecting the life insurance industry, and how that industry can react. Big changes are afoot, and they deserve serious consideration and wider discussion.

History

In the wake of the AIDS epidemic, the immediate financial needs of the victims were satisfied by investors who were willing to purchase their inforce life insurance policies. The sellers received cash to use while they were living to pay for medical expenses and other needs while the investors waited until the insured's death (which is called "maturity" in this market) to recoup their outlay along with what was generally a substantial gain. This market also served other insureds with terminal illnesses.

Initially, the insurance industry fought this growing trend, but regardless of the moral or ethical issues raised, viaticals met a real need. Ultimately, the insurance companies recognized this fact and developed accelerated death benefit (ADB) provisions for their new policies and ADB endorsements for their in-force. Under ADB provisions, if the insured receives a medical diagnosis with a life expectancy of less than two years, the policyholder may receive a substantial percentage (50 percent or more) of the death benefit in advance (e.g., the advanced benefit may be paid in the form of either a withdrawal or a loan with interest, depending on the product design).

These ADB provisions were generally designed to generate little if any additional profit to the insurer, thereby providing a better alternative to viaticals for many



terminally ill insureds. Medical advancements for the treatment of AIDS extended the lives of its victims, turning expected gains into losses for many viaticals investors. Although a substantial marketing and administrative infrastructure had grown to support the viatical business, their business model was threatened.

But, like all successful businesses, they chose to adapt and evolve. The market focus was shifted from the terminally ill to impaired lives. Traditional cash surrender values are based on average expected mortality, and many policies are not kept in force to pay death benefits. It was reasoned that for insureds whose health had deteriorated, their cash surrender values might be substantially less than the present value of future expected death benefits less future premiums. (Note that although this same analysis might cause insureds to think twice before selling or surrendering their policies,

continued on page 14

it does not erase the fact that people do sell and surrender).

At the same time, institutional investors became interested in the secondary market for life insurance policies to produce “non-correlated” investment returns. Third-party underwriting facilities appeared to review medical information and provide mortality ratings and life expectancies for evaluation of potential life settlements. So, the under-two-year life expectancies of viaticals moved to life settlements with life expectancies of five years or more.

Today

Life settlements are a big and growing business and few insurers have yet to react, except to construct roadblocks and editorial comment. The balance of this article will discuss the current life settlement market, its current and likely impact on insurance company experience and how insurance underwriting, design and pricing may change.

Life settlements are on the radar, but just barely. Insurers are well aware of the life settlement market. Some companies are deeply concerned and others don’t see sufficient reason to react. Certainly few, if any, have made changes to their pricing assumptions.

For this discussion, I have defined the life settlement market quite broadly and assigned it into one of two categories:

1. Traditional Sale of In-Force Policies. Policyholders with current cash needs or excess insurance coverage sell their policies to the highest bidders.

2. Premium Financing. This involves the application for and purchase of new life insurance policies. The insurance is purchased by someone with insurable interest in the insured life (the insured) with money fronted by third party investors in the form of a collateralized loan. At the end of the contestable period, the policyholder

either repays the loaned premiums with interest or the policy is transferred to the lender.

I’ll address each in greater detail ...

Traditional Life Settlements

Traditional life settlements follow the pattern of viaticals. Third party bidders look at current medical information on the insured and estimate the insured’s remaining life expectancy. They conclude that maturity (death of the insured) will occur sufficiently soon to provide a good return on the purchase price plus subsequent premiums. The policyholder gets more than they would have received in cash surrender value from the insurer. Apparently, win-win.

In spite of concern by the insurance industry, this market is well established and growing very fast with new entrants all the time. Everyone wants to get in the act. The

Life settlements are a big and growing business and few insurers have yet to react, except to construct roadblocks and editorial comment.

owner has a legal right after issue to sell the policy and insurable interest is only required at time of issue (Note: this will become more important later). Regulations have been set up to license this market. And relatively recently, FASB, the Financial Accounting Standards Board, issued a ruling changing the GAAP accounting for life settlement policies. What previously had to be held on the books at cash

value (creating a significant loss at purchase), can now be booked using either investment or fair value methods. This ruling change will likely increase interest among U.S. companies that previously stayed out of this business.

I should add that the growth of this market has not been without problems. With so many entrants and a shortage of qualifying policies, policies have been bid up due to portfolios accepting longer life expectancies. This may have resulted in overpaying for some policies, based on unrealistic mortality assumptions or inaccurate premium projections (“winner’s curse”), or, at the very least, reducing expected investment returns. I’ve

heard anecdotal reports of aggressive actions by a small number of buyers and sellers of life settlements that might invite legal problems and public relations disasters. Also, there have been challenges to the lack of compensation disclosure, which is generally expressed as a percentage of the death benefit and can be substantial. Some believe these problems will be the downfall of this market while others view these problems as the growing pains of a new business model that will be overcome as it matures.

What products have drawn the most interest? Primarily, policies hurt by falling interest rates. For example, the originally illustrated premiums for many universal life contracts have turned out to be insufficient to keep those policies in force. Account values are being exhausted and significant premiums are required to prevent lapses. People don't have the money for the premiums, but, provided their health is less than optimal, someone will give them significant dollars for their policies. Another example includes permanent whole life contracts where the policyholder simply got more than the cash value from a buyer. The most obvious focus is in big policies! (This is a running theme.)

Well, as noted earlier, this has barely hit the radar of the insurance industry. Some companies may be seeing a slight improvement in long-term persistency, but not much can be detected so far. Thus far, settlements remain a small part of the in force coverage.

Because life settlements involve in-force policies, mainly older policies, the pricing actuary is not in a position to respond proactively, except to observe any shifts in persistency and mortality experience and apply them to current pricing. However, insurers have responded in a few different ways.

1. Some insurers make life harder for the settlement providers through their response to requests for in-force illustrations (e.g., limiting the number and speed of responses, or by taking extra caution and time to process assignments).
2. Some insurers are quite concerned and are addressing this challenge with

public pronouncements and lobbyists. For example, one insurance industry analysis was produced demonstrating that life settlements provide a poor return to the policyholders. This may be

an obvious observation, given the number of parties involved in a settlement transaction who each receive their share, while still providing a good return to the ultimate purchaser. However, policies are sold into the settlement market for the same reason people lapse and surrender, only settlements offer more money

to the policyholder. If all policyholders made consistent decisions regarding persistency relative to their current health, current mortality assumptions (which are derived from experience studies with imperfect lapsation) would be rendered invalid.

3. Some insurance companies are going the other way, deciding, "If you can't beat 'em, join 'em." At least one insurer has a significant settlement portfolio (that includes policies from other insurers). Such a portfolio might act as a hedge against adverse mortality experienced by their in-force life insurance. For this to work effectively, new rules would need to be promulgated relative to valuing life settlements as assets of a life insurance company.

In an article in 2003, I suggested that insurers should find some legal manner in which to make individual offers to surrendering policyholders based on updated underwriting information. Insurance departments and consumer advocates would support any measure that gave policyholders more money. I've had conversations with regulators who were quite supportive. Many policyholders would be more amenable to making this transaction with the insurer rather than have some third-party investor waiting for them to mature (die), perhaps to the point of accepting a lower offer.

Many companies have excess underwriting capacity, rendering that a marginal

What products have drawn the most interest? Primarily, policies hurt by falling interest rates.

continued on page 16

expense. It should be noted that underwriting of life expectancy for settlements is quite different than underwriting for new issues. Underwriting a new policy involves debits for each separate medical condition. These debits are additive, so that someone with multiple conditions would face a very high rating. However, insureds can succumb to death only once from one single cause. Because underwriting life settlements involves balancing the various risks to produce a meaningful rating and life expectancy, the underwriters would have to adjust their thinking along these lines, perhaps even requiring research and retraining.

Premium Financing

The second category groups different types of sales together for this discussion. The common thread is that new policies are being issued with the clear intent not to surrender prior to death, with insurable interest initially or ultimately ending up in the hands of third parties.

- Premium financing loaning money to the insured to pay the premiums for two years. After two years, the insured can repay the loan or transfer the policy to the lender who will treat it as a “life settlement.”
- Charity-owned life insurance: investors approach nonprofits with an insurable interest in their donor’s lives. The investors lend the money to buy the insurance and promise the nonprofit will receive some return over death benefits required to satisfy the investor’s needs. There is currently some discussion regarding the level of insurable interest a charity may have in a donor’s life, and whether the small returns provided the charity is sufficient justification for the large amounts of death benefit accruing to the investors.

- Stranger-owned life insurance: similar to charity owned.

Underwriting a new policy involves debits for each separate medical condition. These debits are additive, so that someone with multiple conditions would face a very high rating.

What is driving this trend? New players come to this market every day; investors, agents, portfolio aggregators and others. Much of this new investor money is being used to finance the new policies in expectation of positive returns. The traditional life settlement market is growing with the demand for in-force policies. It needs many larger sized policies to meet the demand, more than it’s finding now, and more than foreseen as coming into the market. The premium financing market is creating that supply of big policies for the settlement market, not for this year, but in two years, when all those policies will be beyond their contestable period and possibly in play.

Many pricing actuaries wonder how this can possibly work. The premium financing model appears to be flawed by the assumption that the value of “any” new policy in the secondary market after two years will exceed the premiums plus interest. How can that be? Any pricing actuary knows that, at issue, policy premiums are sufficient to pay expenses and future claims. If most of the first two premiums go to underwriting and acquisition, the remaining premiums must exceed future expected mortality.

Insurance companies may see it the same way, especially when the alternative might require actions that would discourage some sales.

It is clear by now that something doesn’t add up. There are too many opposing points. Someone must be wrong. So we ask, “Who’s wrong?”

Well, as Bud Abbott said to Lou Costello, “Now that’s the first thing you’ve said right.” Someone is wrong, but there are more than one ‘Who.’

As noted earlier, there are a many new entrants to this business. There are inexperienced marketers who believe that premium financing can work with any and all policies.

They believe that financing many policies with investor's cash will automatically produce a substantial and profitable life settlement portfolio. They may not have a plan for deciding what policies to buy, but they have heard that this market is a golden opportunity. So, in many cases, the lender is wrong. After all, no one can predict which insureds will be sicker than average in two years. And the mortality tables used in pricing ensure that the premiums are sufficient to cover expected claims.

Or perhaps not ...

Pricing is often done by applying percentages to one of the standard industry tables (or perhaps one developed in-house). These industry tables have been developed from experience studies. However, that experience has been sparse or non-existent in many cells. Mortality at the highest ages is more-or-less conjecture and extrapolation. The 1975-80 Table did not have any values over issue age 70, although some extensions were created. The higher ages of the Valuation Basic Tables (VBT) are not based on U.S. Life Insurance industry experience. This may not be a problem when selling policies at many ages (and a small amount in these older ages), but may become more of an issue if older ages are targeted.

Some companies may offer products priced using the same percentage for each class at all ages (e.g., preferred non-smoker is 50 percent of VBT at all ages and durations). However, at what point does mortality really approach one? If you use 50 percent of a table at age 98 or 99, are you underestimating deaths at high ages? Also, does the difference between preferred classes never disappear? If someone is 90 or 95, does it matter if they were super preferred or preferred or standard? It has been argued there must be a point where this all wears off.

Tom Rhodes has reported at recent SOA meetings that some companies see a significant spike in mortality experience in year three, often in excess of expected. He theorized that this is a result of incontestability, that for deaths during the first two years, misstatements can be identified and rectified. After the two-year contestable period,



all bets are off. Are companies missing important issues during underwriting or are their pricing assumptions based on studies overly weighted towards early duration experience?

This suggests the possibility that some insurers and some products have some degree of mispricing which may potentially be exploited, but mortality assumptions are not readily determined or compared outside observers. How can an investor find these opportunities without knowledge of product design or inside information?

The answer is to target low premium products. This market is driven by death benefit, so par whole life and cash value accumulation policies are not of interest. Instead, investors aim for UL (with and without secondary guarantees) wherein, like the term market, current premium is the driver and is also easy to compare against other companies.

Moreover, these investors may be assisted by the insurance industry's own creation, the sales force. Independent agents may file applications on the same life to multiple insurers. These agents may even know by experience which companies will generally provide the most aggressive quote on specific medical conditions. When underwriting is complete, the premiums and assigned rating class from the various issuers can vary significantly. The same applicant may be rated highly substandard at one company,

continued on page 18

and preferred at another. And so, “winner’s curse” may haunt the ultimate issuer of the policy.

Product Pricing and Premium Financing

If the premium financing market is wrong, insurance companies can expect to see many lapses after a few years as policies fail to draw sufficient interest in the secondary market. But, for those policies and companies against which this market successfully anti-selected, there may be trouble in the offing. With this in mind, pricing actuaries need to consider the impact on new products. A few examples are given below:

- Many of these policies will be funded at the minimum premium level. The investors may not pay the secondary guarantee premium amount if a lesser amount will get them to the next anniversary. They believe that the insured is expected to die long before the end of the table, so why pay more than absolutely necessary? Hopefully, pricing included testing profitability at these lower premium patterns.
- Persistency will be quite high, especially at higher ages, which had probably not been significantly weighted in pricing. Mortality may be much higher than expected at those ages too. Since expected mortality at higher ages is often a multiple of that at lower ages, there may be a significant increase in claim costs, even if these sales represent a small proportion of the in-force. So, just when AXXX relief may be on the horizon in the form of principles-based reserves, poor experience may require even higher reserves.
- Assumptions for persistency and mortality cannot continue to rely on inefficiencies in policyholder behavior; these assumptions must be set such that higher persistency will result in higher mortality.

- Reinsurers are responding with increased vigilance. It has become very difficult to obtain AXXX reinsurance. Reinsurers are increasing their underwriting audits to identify and correct ceding companies who are too liberal with underwriting exceptions. Shopping plans for better underwriting are disappearing. Rating concessions under which applicants rated substandard may be issued standard class policies, are disappearing.
- Companies are finding ways to identify these policies that are being purchased to ultimately benefit an unrelated third party. Economic underwriting may detect premium financed and stranger-owned policies that can be declined by the insurer.

Regardless, an insurance company must recognize that, if their product is drawing a lot of sales from this market, they may have a very competitive product or this may be an indication of mispricing. It is clear that, in the future, the product actuary will have to apply considerable judgment and creativity to respond to this shift in how insurance is used. □



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Inflation-Indexed Income Annuities: Pricing Considerations and Investment Strategies

by Simpa Baiye

Executive Summary

Inflation-indexed income annuities are the latest trend in the income annuity market. A number of products have been recently introduced and offer varying degrees of insulation against the erosive impact of inflation on the real value of income payments. In this article, common features of inflation-indexed income annuities are reviewed. Pricing and reserving considerations and possible issuer investment strategies for these products are also addressed. Finally, a pricing comparison of an indexed-income annuity to a nominal income annuity is presented.

Background

Inflation-indexed income annuities (also known as real-income annuities) are payout annuities with periodic adjustments made in line with annual changes in an inflation index. A common reference index is the non-seasonally-adjusted consumer price index for urban wage earners (or CPI-U).

Inflation-indexed income annuities have long been publicly available in the form of social-security benefits with CPI indexing. Concerns about the long-term viability of Social Security, coupled with the emergence of a market for inflation-indexed securities and inflation derivatives, have spurred the development of private inflation-indexed annuities. Insurance carriers such as MetLife and AIG have recently entered the real-income market.

Common indexation designs include structures that cap the extent to which income payments can be adjusted, as well as floors



that provide that payments will never reduce due to deflation.

Pricing Considerations

Plain-vanilla real income streams are valued using rates on the real Treasury spot curve in conjunction with the term structure of credit spreads available to the underwriting carrier. Credit spreads represent the excess of bond yields over nominal Treasury rates. This pricing approach stands in contrast to nominal income annuities, which are priced using rates on the nominal Treasury spot rate curve and the term structure of credit spreads.

The real Treasury spot curve can be constructed from yields available on Treasury Inflation-Protected Securities (TIPS). Careful consideration will need to be given to the construction of the real curve, as

continued on page 20



data on key points on the curve may need to be determined by interpolation.

Real income payments that are subject to floor and cap provisions need to be valued. Adjustments to reflect the capital-markets cost of these provisions can be made to the credit spread structure.

Reserving Considerations

Statutory reserving for real income annuities is governed by the commissioners annuity reserve valuation method (CARVM). The greatest present value of future guaranteed benefits needs to be determined. Future guaranteed benefits could be defined as projected nominal benefits and discounted at appropriate nominal statutory valuation rates, or may be defined as a level stream of real income payments that are discounted at “real” statutory valuation rates. The former valuation approach could be performed with inflation-rate scenarios for products with floor and cap provisions on payment adjustments. Real statutory valuation rates can be determined by adjusting nominal statutory valuation rates for expected long-term inflation.

GAAP reserving for real income annuities is subject to FAS 97. Equivalent nominal projected income streams can be determined

by converting real-income streams using the term structure of inflation rates. This nominal income stream can then be discounted at the earned rate on assets backing the liability. A scenario-based approach can also be employed for product designs with caps and floors on inflation adjustments.

Investment Strategies for Real-Income Annuities

Strategies available for hedging real annuities are limited to the available universe of inflation-indexed securities and derivatives. Possible strategies involve either a combination of TIPS and credit-default swaps or a combination of corporate bonds and Consumer Price Index (CPI) swaps.

Employing TIPS and credit default swaps involves taking a long position in TIPS and a short position in credit default swaps. A short position in credit default swaps generates credit spreads, along with a liability contingent on defaults in the pool underlying the swap. TIPS are generally subject to income tax on the accretion of their face amount well before their maturity. This tax on “phantom” income has unfavorable cash-flow consequences. Credit default swaps generally have a tenure of 10 years or less and have limited variation in available credit quality.

A combination of CPI swaps and regular nominal bonds involves the exchange of nominal coupon on bonds for inflation-adjusted coupon under a payer CPI-swap arrangement. The payments and notional could be structured to fit well with the liability. CPI swaps thus provide greater investment-strategy flexibility to a real-income annuity carrier.

The market for CPI derivatives has developed greatly in the past few years. It also has more liquidity than the TIPS market. However, investment banks are generally unwilling to quote special structures or provide swaps with tenors in excess of 30 years.

Table 1: Payout Payment Comparison

Payout Type	First Annual Payment
Nominal	\$77,000
Real (no caps or floors)	\$55,260
3% Annual Cost-of-Living Adjustment	\$54,700

Table 2: Pricing Assumptions

Assumption	Value
Annual Mortality Rate	1.5% to age 100, 100% thereafter
Nominal Treasury Rate	5%
Real Treasury Rate	2%
Credit Spread	1%
Profit Margin	0%

Illustrative Pricing Example

Table 1 illustrates the first annual payment under three different immediate lifetime income annuities for a female aged 65 with a premium deposit of \$1 million and with payments beginning immediately. Table 2 outlines the assumptions employed in generating the results.

The initial difference in annual payments between the nominal and real is a reflection of the cost of hedging inflation risk. Observe that the first annual payment for the real income annuity is very similar to the first annual payment under the income annuity with an annual cost-of-living adjustment of 3 percent. It is no coincidence that the prescheduled increase of 3 percent is exactly equal to the difference between the nominal Treasury rate and real Treasury rate. The real income annuity is comparable to an income annuity with scheduled cost of living

adjustments, but could provide a more cost-effective hedge against inflation risk.

Conclusions

The market for real-income annuities has evolved in tandem with the inflation-indexed securities and inflation derivatives markets. Pricing and reserving considerations for these products should incorporate the dynamics of securities and derivatives that explicitly hedge inflation risk. Real income annuities can be evaluated relative to income annuities with scheduled cost-of-living adjustments. The true value of real income annuities lies in their accurate reflection of the cost of hedging inflation risk. This reflection can be cost-effective from a financial markets perspective. □



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2004 Inter-Company Expense Study of U.S. Individual Life Insurance and Annuities

by Steven C. Siegel



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The SOA's Committee on Life Insurance Company Expenses (CLICE) has recently completed its fourth inter-company study of expenses for individual life and annuity business issued in the United States. The full report of this study is now available on the SOA's Web site. This article provides highlights from that study.

The data requested was identical to that requested for the 2003 study. In addition, the total number of contributors (28) providing data remained the same. However, a number of contributors were new to the study this year, while some previous contributors were unable to contribute. CLICE is hoping to increase the number of contributors for the 2005 study and future ones—if your company has not previously contributed, CLICE welcomes your participation!

- **Annuities** – Immediate (non-variable), deferred (non-variable), variable immediate and variable deferred. The following distribution channel detail was requested: career, brokerage, PPGA, stockbroker, financial institutions, other and unallocated.

The data received from the contributors were aggregated and unit cost calculations were developed. As part of the aggregation process, a series of data integrity checks were performed and contributors were contacted to resolve missing or anomalous data.

Overall, the data submitted to the study continues to improve in reliability and data integrity. This is due, in part, to the number of repeating contributors familiar with the data submission form and the scope of data requested.

In the study, a unit cost called “per policy index” is used to facilitate the comparison of first year expenses (excluding commissions and premium taxes) among contributors. Similarly, a per policy in force unit cost is used to compare operating expenses (excluding commissions, termination expenses, premium taxes, and for annuities, annuity payout expenses). These two unit costs provide the reader with a high-level basis for making comparisons. To the left is a table comparing these unit costs for 2003 and 2004 for companies that contributed to both studies.

Please note that due to variations in expense allocations used by the contributing companies, the variety of companies that contributed, and the limited number of contributors in certain categories, the results should be viewed with caution, particularly the comparison of this study with the corresponding 2003 figures.

The exhibits in the full report show unit expense calculations for the various product and distribution channels for which sufficient data was available, including the weighted average by company, median, unweighted average by company and 25th and 75th percentile unit expenses where there was a sufficient number of contributors. Summarized acquisition and non-acquisition unit costs are illustrated in the tables on page 23.

The committee has distributed a request for, and received contributions to the 2005 study, which will further continue this annual effort. The committee expresses its appreciation to all of the contributing companies for their assistance and support of this study. □

Comparison of 2003 and 2004 Per Policy Index Unit Costs For Companies Contributing to both 2003 and 2004 Studies

	Products	Year	First Year*			Inforce#		
			25% Percentile	Weighted Average	75% Percentile	25% Percentile	Weighted Average	75% Percentile
Life	Term	2003	\$499	\$541	\$758	\$61	\$75	\$133
		2004	496	672	1,160	71	75	133
	Permanent	2003	545	1,069	1,515	57	62	120
		2004	445	1,572	2,307	51	53	116
	Variable	2003	609		2,262	112	125	195
		2004	2,129	3,319	3,974	187	195	427
Annuities	Deferred	2003	\$346	\$897	\$1,287	\$99	\$105	\$139
		2004	516	943	753	94	119	167
	Immediate	2003	258	1,246	750	78	100	107
		2004	332	731	773	53	133	137
	Variable deferred	2003	634	1,686	1,562	124	145	185
		2004	620	1,830	1,151	136	259	253

*Excludes commissions and premium taxes

#Excludes commissions, premium taxes, termination expenses, and contract expenses during payout period

Contributors were asked to provide expense data for the following product categories:

- **Life insurance** – term, permanent (non-variable), variable, COLI and BOLI. Contributors were further asked to provide acquisition expense data broken down by the following distribution channels: career, brokerage, PPGA, multi-line, direct response, other, and unallocated (those expenses that were not split by channel).

Acquisition Expense for Individual Life Insurance

Product Type	Number of Companies	Per Policy Issued	Per \$1,000 Face Amount Issued	Percent of First Year Premium	Commissions (% of premium)		
					First Year	Single Premium*	Renewal
Term	25	\$190	\$0.44	45.5%	61.3%	N/A	3.3%
Permanent	26	\$183	0.86	47.7%	50.9%	3.3%	3.6%
Variable	14	\$375	0.39	38.3%	35.4%	2.0%	4.9%
Total	27	\$197	0.54	45.6%	49.8%	3.1%	3.8%

* includes dumps/pour-ins and dividends applied

Non-Acquisition Expense for Individual Life Insurance

Product Type	Number of Companies	Per Policy In force	Per Claim	Premium Tax
Term	25	\$66	\$409	1.6%
Permanent	26	\$62	\$96	1.2%
Variable	14	\$218	\$333	2.5%
Total	27	\$72	\$109	1.4%

Acquisition Expense for Individual Annuities

Product Type	Number of Companies	Per Policy Issued	Percent of First Year Premium	Commissions (% of premium)	
				First Year/Single	Renewal Commission
Deferred - Fixed	15	\$145	1.5%	4.9%	5.1%
Deferred - Variable	13	\$144	2.3%	4.8%	3.8%
Immediate - Fixed	17	\$168	1.6%	2.4%	N/A
Total	24	\$145	2.0%	4.8%	4.1%

Non-Acquisition Expense for Individual Annuities

Product Type	Number of Companies	Per Policy In force	Per Termination	Per Contract	Premium Tax
Deferred - Fixed	15	\$113	\$45	\$12	0.1%
Deferred - Variable	13	\$192	\$32	\$12	0.1%
Immediate - Fixed	17	\$135	\$27	\$5	0.2%
Total	24	\$154	\$37	\$10	0.1%

ANNUAL MEETING & EXHIBIT

SOA⁰⁶

OCTOBER 15–18, 2006

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The Power of Ideas

The Product Development Section will be providing 11 informative sessions during the 2006 SOA Annual Meeting on October 15-18, 2006 at the Sheraton Hotel & Towers in downtown Chicago. This meeting also overlaps with the General Meeting of the Canadian Institute of Actuaries on October 18-20, 2006. Be sure to attend to catch the latest information on...

PRODUCT DEVELOPMENT OVERVIEWS

- Life and Annuity Product Development Year in Review
- What's New in the Deferred Annuity Market
- What's New in the Payout Annuity Market

PRICING METHODS

- Pricing Lapse Supported/Lapse Sensitive Products
- Pricing on a GAAP Basis

PRINCIPLES-BASED VALUATION AS IT APPLIES TO PRODUCT DEVELOPMENT

- Principles-Based Valuation : What the Product Development Actuary Needs to Know
- Principles Based Reserving: A Case Study for PD Actuaries
- Pricing in a Principles-Based Reserve World—The Canadian Experience

UNDERWRITING AND PRODUCT MANAGEMENT REVIEWS

- You Bet Your Life—Insurable Interest in Life Insurance
- The Life Settlements Market

HOT BREAKFAST

And as always, be sure to attend the Product Development Section Hot Breakfast to network with your peers and get the latest on the activities of the Product Development Section.

Find out more at www.SOAannualmeeting.org

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