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Fixed Annuities— Product Design and Investment Considerations

by Graham Ireland



Fixed annuity profitability is more sensitive to investment risk than traditional life is. A company's investment strategy needs proper consideration. My article consists of 10 helpful points. Points one through four are for actuaries who are unfamiliar with fixed annuities. Points five through 10 are more advanced issues. An actuary experienced with annuity pricing might want to skip directly to these.

1. Understand the business you're selling.

An insurance company incurs large acquisition costs when it sells a fixed annuity. Commissions can easily exceed 5 percent (or 10 percent in the case of equity indexed annuities). Add in non-commission acquisition costs. Add in the popular "bonuses" that pay extra interest in the first policy year (usually 1 percent for fixed annuities, and as much as 10 percent for indexed annuities). All these costs are funded at policy issue from company surplus.

You are relying on earning a spread between the earned rate on your assets and the rate you credit to the customer in order to recover those acquisition costs and earn a profit. You are making a bet on persistency, which you can tilt your way with surrender charges and market value adjustments.

2. Persistency drives profits.

If the policyholder leaves early, the company may lose money even if surrender charges are applied. If a customer dies early, the company may lose money. Remember that commission chargebacks typically only apply for one or two policy years. Early death means commissions for higher issue ages (75+) are usually a lot lower than for business issued at ages under 75. Higher issue age = shorter liability duration at issue. This should influence your investment strategy.

Persistency is somewhat predictable in the surrender charge period. Lapse rates are lower than if no surrender charge exists. But expect high lapse rates ("shock lapse") right after the surrender charge periods. There is no consensus on what "high" means, but 30-50 percent is not unreasonable. The shock lapse rate will influence your investment strategy and partly determine ultimate profitability.

Expect interest-sensitive lapse at all times. The rate of lapse is a function of the difference between your credited rate and the rates of key competitors. That function is often assumed to be exponential. A 2 percent difference in rates may mean more than twice as much lapse as a 1 percent difference. Interest-sensitive lapse and shock lapse act as an option the policyholder can use against you. It limits your ability to hold assets with a longer duration than your liabilities (otherwise known as taking interest rate risk).

3. You control your credited rate. Your earned rate is partially unknown.

The difference between the two rates is sometimes called "spread."

The fixed-income portfolio you buy at policy inception makes principal and interest payments to you which must be reinvested over the life of the policy. Unless they want to incur interest rate risk, life insurance companies typically "invest down the curve" as the shock lapse period approaches. This means they invest in progressively shorter assets to pay the expected benefits. Policyholders who do not face surrender charges can leave at any time. Insurance companies should not incur a lot of investment risk for such policyholders.

Insurance companies can forecast the initial earned rate on assets backing a policy reasonably well. There are certain unknowns, such as how long it will take for the company to source a mortgage, if mortgages are in the investment mix.

The earned rate over the life of a policy is unknown, due to reinvestment. It's generally unwise to design products, investment strategies, or crediting strategies, where the initial spread is much less than the projected ultimate spread. If you expect to make significant profits at the back end, you are making earned rate and persistency bets that may not pay off.

4. When designing policies, try to minimize the guarantees and options you extend to your policyholders.

Insurance companies are in the business of making guarantees to their policyholders. Competitive pressures sometimes require that a company make a guarantee. Companies historically have relied on holding sufficient surplus so that they can honor those guarantees even under adverse conditions. However, the volatility of modern financial markets, the pressure on insurance company management to maximize capital efficiency and returns on capital, and the growing sophistication of consumers, make some guarantees expensive. In addition to economic impact, guarantees have a way of driving up reserves, and hence a company's capital cost. These guarantees and options are discussed in more detail throughout this article.

In summary, it's a good idea to assess all your product risks and price accordingly.

5. Different asset classes perform differently in different interest rate environments. Price accordingly. ▶▶

► Most of us know that bonds pay interest at a stated rate (the coupon rate). Most insurance companies price their products assuming they “buy and hold” the investments, sell them to the extent they need to make benefit payments, and reinvest when investments mature. But the interest and maturity are not necessarily certain.

- **Bonds can have call provisions that allow the issuer to redeem them in certain conditions.** For example, if interest rates fall, the issuing company can redeem the bond and refinance their operations at a lower rate so they can pay less interest on their debt. If they call your bond, you'll have to reinvest and earn less than you expected.
- **Mortgage-backed and asset-backed securities (MBS and ABS) behave differently depending on the change in rates.** These securities are complicated, and while the payments of interest and principal are tied to a formula, they are uncertain. If interest rates fall, more people will refinance their debt. Your investment will be returned to you earlier than you expect, and you'll have to reinvest at a lower rate. If interest rates rise, refinancings are unlikely. Your investment will be returned to you later than you expect, and you'll be earning interest at a lower-than-market rate. Options extended to policyholders typically behave in the opposite direction of the options inherent in MBS and ABS.
- **In addition, there are two types of MBS. Collateralized Mortgage Obligations (CMOs) are tied to residential mortgages.** Commercial MBS (CMBSs) are tied to commercial mortgages. CMOs and CMBSs behave differently in different rate environments because refinancing terms for residential mortgages are different from commercial mortgages.

6. Don't rely on “average pricing” when you design or sell a policy.

“Average pricing” means picking a “representative” interest rate scenario for projecting cash flows and using the results to justify your decisions. Many of the important cash flows in an SPDA or FPDA projection are dependent on the future changes in the term structure of interest rates. Those cash flows include but are not limited to:

- Principal and interest payments from the investments backing the annuity
- Income from reinvestment of principal and interest payments from the initial portfolio
- Capital gains or losses from the sale of the investments
- Income on required and/or free surplus
- Surrender benefits and surrender charge income associated with the surrenders

- Gains or losses on the sale of options (in the case of equity-indexed annuities)

In addition, default experience on the underlying asset portfolio does not directly vary with interest rates, but is unstable over time. The variability of these and other cash flows means the actual profitability of the policies you sell can be quite variable. Try to select investment strategies and product specifications that minimize that variability.

The cost of options required to support equity-indexed annuities is influenced by a number of factors, among them interest rates and “implied volatility.” Do not assume option costs will be constant over the life of the policy. If the policy lapses or dies, do not assume you can sell them for the price you bought them. The variability in option prices should help drive your crediting strategy. Try to maximize flexibility. If you embed guarantees of “participation rates,” “caps” and “spreads” into your policies, don't rely on average pricing to assume these guarantees are costless.

7. If you are using an interest rate generator to model future changes in interest rates, subject the results to a “smell” test.

Here's an example of what I mean. Interest rates are low today by historical standards, and the yield curve is steep. Insurance companies can earn a lot more income if they buy assets with longer life (for example, 10-year bonds instead of five-year bonds). An insurance company could run a model with 50 interest rate scenarios, and justify its decision to buy 10-year assets by looking at the model output, and assuming the output quantifies the risk. But the output may be based on interest rate generation that says five and 10-year Treasuries won't rise above 6 percent in the next 10 years. Are you 100 percent sure that's true? They were that high two years ago. What happens to your business if we return to the interest rates that prevailed in the early 1990s, when 10 year Treasury notes yielded 7-8 percent?

Interest rate generators are powerful tools, and are invaluable in modeling fixed annuities. But they are all based on key assumptions. Some generators may stochastically model an interest rate for one time period (for example, the 10 year Treasury rate), and then derive the rest of the term structure based on the rate they have modeled. Other models may incorporate what is called “mean reversion,” which limits the generator's ability to produce “sky high” interest rates. Still others may assume that the curve tends to revert to a term structure with a slope based on historical data.

An interest rate generator produces a distribution of rates for each time period you'll be modeling. Each rate has an associated probability. The value of an interest rate generator does not lie in the mean of the distribution (the average interest rate the generator produces), but in the distribution itself, and the “tail”—unusually high or low rates that impact your model results.

8. Design and manufacture your annuity with a higher interest rate environment in mind. ►►

- Interest rates are low today. To the extent they rise over the next several years, the profitability of insurance company fixed annuity blocks will be suspect. The reason? Disintermediation. A rise in interest rates can make new money fixed annuity rates of your competitors very attractive to policyholders suddenly receiving an old, “sub-market” rate. Large fixed annuity writers assume lapse rates in such environments can be very high, as they will have an unpleasant choice—raise their crediting rates on in-force business to unaffordable levels, or take interest-rate-driven capital losses when selling assets to pay surrenders.

Strategies to consider in preparation for a higher interest rate environment include:

- Use the highest surrender charges consistent with the Standard Nonforfeiture Law (SNFL).
- Do not allow cumulative free partial withdrawal provisions.
- Insist on market value adjustment provisions if possible.

9. Design and manufacture your annuity with a low interest rate environment in mind.

The recent decline in interest rates to 40-year lows took many people by surprise, and was not something “average” pricing would contemplate. How has this decline affected fixed annuities, and what will a further decline do?

- Minimum interest rates required on fixed annuities can become unaffordable.

Policies insurance companies sell today that either guarantee a minimum rate each year (like 3 percent), or comply with the SNFL, may have a rate that can't be afforded unless the company takes a lot of interest rate risk. For example, the earned rate for assets backing a five-year surrender charge product may be 4.5 percent. If the company has to credit 3 percent, the 1.5 percent spread may be inadequate to earn targeted profit. The company could buy 10-year assets, which earn much more, but if interest rates are much higher in five years, those assets will be worth much less than their purchase price. If they have to be sold to pay surrender benefits, they'll be sold at a loss. And the difference will come out of the insurance company's surplus.

The NAIC appears to be moving to flexible minimum interest rates—the SNFL and any minimum crediting

Policyholders may decline to surrender their policy, since they can get a better rate from the insurance company than they can anywhere else.

rate provisions will be formula-driven. This change would mean credited rates in the early years of a policy are affordable, but not necessarily the credited rates several years after policy issue.

File your fixed annuities with the minimum interest rate provisions as flexible and as low as possible.

- Policyholders may decline to surrender their policy, since they can get a better rate from the insurance company than they can anywhere else.

The first bullet in this section discussed unaffordable credited rates. The problem of unaffordable credited rates gets worse if policyholders decline to surrender their policies.

- Market value adjustments will be to the favor of the policyholder in a lower interest rate environment, creating an incentive to lapse.

10. Don't assume the market value adjustment means you have no investment risk.

Aside from default risk, market value adjusted annuities may have changes in liabilities that do not perfectly match changes in assets. The reason is that MVA formulas are pretty simple. They calculate the adjustment based on the difference in two rates. The two rates are most often either Treasury rates or credited rates. Changes in the market value of assets reflect not just two rates, but changes in the entire term structure of interest rates. “Term structure” here means not Treasury rates, but the rates earned on the asset classes you invest in. The spread those assets earn over Treasuries is not constant over time.

If you value both assets and liabilities of MVAs at market, changes in the difference between market value of assets and market value of liabilities will flow to surplus, creating surplus volatility. ●

Graham Ireland FSA is employed by Allstate. He can be reached at 847.402.0094 or at gireland@allstate.com.