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Structured Creativity: Six Sigma Quality and Product Development

by Eva Goldstein

Introduction

Product development is variously described as a science, an art, or a philosophy. Six Sigma suffers from the same ambiguity—it is a statistical measure, a business philosophy, a process, a methodology, and a way of living! But by combining the two, we are able to apply structure to creativity and enable product success.

Many people balk when they hear they words "creativity" and "structure" in the same sentence—it is commonly believed that structure stifles creativity. However, how many good ideas never see the light of day because there is no process in place for bringing them to the attention of company decision makers? And how many bad ideas are brought to market because there are no controls in place to prevent their development? My guess is a lot!

Six Sigma is a quality initiative implemented across all GE businesses. It is a data-driven, customer-focused, and customer-touching approach to doing business that looks at whether an organization is delivering what its customers require. We measure product or process performance against what our customers

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Thoughts on the Enhanced Earnings Death Benefit

by Douglas L. Robbins

The 1990s saw the rise of many types of variable investment products within the life insurance industry. It was only natural that hedging strategies and products would emerge in response to the inherent risk of loss of value in variable life and annuity products. This article explains a 21st-century twist on the concept for annuities, the Enhanced Earnings Death Benefit (EEDB) Rider.

The advent of this rider sparked quite a bit of interest in the industry. This is at least partly because, as a rider that increases in cost to the insurance company when separate account assets increase, it is countercyclical to many other riders sold (as well as the profitability of the base annuity product itself). For this reason, we believe that this rider can be less risky to offer, even in a relatively rich form, than it appears on its surface.

Past Guaranteed Death Benefit Riders

Several types of Guaranteed Minimum Death Benefits (GMDBs) have been sold within both base deferred annuity products and riders throughout the 1990s. The general form of these riders is to assess a charge as a percent of the annuity fund value and provide a floor death benefit regardless of fund performance. The various ratchet and roll-up benefits that were sold were intended to help the annuitant with estate planning amidst volatile equity markets.

However, they did not address certain tax considerations that affect deferred annuities upon death of the annuitant. Life insurance offers several tax advantages over deferred annuities on death. With a life policy, the death benefit is much higher than the cash value, and policy gains (on death) are not subject to federal income tax. For example, say a policy has cumulative premiums of $50,000, a cash value of $80,000 at the time of death, and a face amount of $150,000. If the insured dies, the entire $150,000 goes to the beneficiary free of federal income tax.

Annuities have neither of these advantages. Gains on a non-qualified deferred annuity are subject to federal income tax, whether as a result of gains in the fund value or as a result of a GMDB. (On a qualified product, the entire amount paid on death is taxable.) So, expanding the above example, say an annuity had the same cumulative premiums, cash value, and death benefit (due to say a bull market up to a ratchet point, followed by a bear market). In this case, the annuitant's estate could lose up to $40,000 to federal income taxes (based upon the 40% tax bracket, combined with the $100,000 gain).

There are also estate tax considerations on death, and these can vary a lot under current law by date of death. However,

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these are beyond the scope of this article, and in any case, the insurance industry has not yet devised a product that deals with them.

The Next Wave: The Enhanced Earnings Death Benefit Rider

Within just the past couple of years, a new product has been developed to help meet these limitations, with particular emphasis on the taxable gains. The Enhanced Earnings Death Benefit Rider is designed to shield the gains by adding sufficient funds to cover the federal income tax on them, at least in part. (The most common percentage is 40%, or 25% at higher issue ages.) In the above example, the EEDB on death might be $40,000.

Note that the benefit amount would itself be subject to FIT for riders that are structured as an enhanced death benefit on a deferred annuity. There is a variation in which a life insurance rider pays a non-taxable death benefit; but this has to be funded with an influx of after-tax funds from outside the annuity or from a possibly taxable partial withdrawal.

The EEDB is a step forward, then, but it is only the first step. The most common current product designs typically cap the benefit payable, often at 40% of the cumulative premium. Furthermore, gains covered under the EEDB rider do not include gains created by a GMDB, although those gains are still taxable.

So in the example above, only $12,000 (40% of the $30,000 gain within the contract's cash value) would be paid under the EEDB. That would mean a taxable income exposure of $28,000 uncovered by the rider. And even if the $150,000 death benefit were equal to the cash value at the time of death, the rider's benefit cap would limit the benefit to $20,000. The rider, if it is capped in this way, fails to fully meet its purpose for existence. And, this effect becomes worse the higher the fund value (or GMDB) grows.

However, an uncapped EEDB, which would cover all gains, regardless of fund performance, would at first appear to be exceedingly costly. Let's say, for example, that a variable annuity has 8% fund value growth (after base product loads) each year. For simplicity, assume a population in which all members live for 25 years, and then all die at exactly that point. In that time, an annuity starting at $50,000 would increase to about $342,000. Upon the eventual death, the EEDB additional benefit would be about $117,000. Funded over 25 years as a percent of account value, and assuming a net earned rate of 7%, this costs over 1.50% of fund value per year (whereas our calculations show that the capped benefit would cost only about 0.25%).

It seems clear that a 150 basis point cost could not be supported by typical product loads, and that most policyholders would be unwilling to pay such a rider charge. But this cost does not take into account the normal policyholder behavior that occurs in terms of lapsation and partial withdrawals; nor does it take into account the maximum maturity age on most deferred annuity products.

Assuming an average 10% annual decrement rate over the 25 years until death in the above example reduces the 1.50% for an uncapped benefit to 0.34%. And if we were to charge 35 basis points for the rider, the resulting reduction to the 8% net earned rate would drop the annual cost further to 0.32%. Given these conditions, we look to be near a solution. But on the other hand, if the average annual net fund

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Ralph Gorter, FSA
Product Development News Co-editor
408 Route 22, #3
North Salem, NY 10560

Phone: (914) 232-7834 E-mail: *RGorter129@aol.com*

value growth (before rider charges) doubled to 16%, our annual cost would increase back to over 1.10% of fund!

Actuarial Analysis Can Frame the Risks

This looks like a daunting risk to take at first glance. How can one offer a benefit for which you would charge 0.35% on an expected basis, but which might easily cost so much more than that?

We would suggest that the answer lies in taking a holistic view of the annuity product combined with the EEDB rider. The reason for the increase in the rider's cost on the 16% net return scenario is that we expected the fund value (per policyholder remaining, at $50,000 initial premium) at the end of 25 years to be around $300,000 (at 8% net growth), and at 16% net growth, it was almost $2 million.

But let's take a look at what else might be going on. Let's say that, to sell this annuity, we will have 8% of the premium up-front as acquisition costs. In addition, let's also assume that to maintain it will cost us $100 per year. Assume that the M&E and other fund-based revenues amount to 1.75% per annum.

Under this set of assumptions, the additional product and rider asset charges we would take in at 16% fund growth (accumulated to year 25 at our 7% rate) would more than offset the increased cost of the EEDB. (Pricing on an IRR basis, one would be even further ahead, because the implied discount rate on the eventual death benefit enhancement is then much higher than 7%.) Even if we decide we must cap the EEDB at some (higher than current) level in order to help manage the risks, it seems clear that it could be much higher than where much of the industry currently has it set.

In fact, some producers of late appear to be taking this view, at least to an extent. A few companies have raised the maximum benefit on their EEDB riders from 40% to 100% of premiums paid (while also increasing the asset charge for the rider). Perhaps this indicates growing recognition that a richer EEDB provides a stronger countercyclical effect within a variable annuity than a less rich version.

A key assumption making much of the preceding reasoning possible is the date of death. (If death were expected in 5 years in our example, then no reasonable rider charge would cover that cost.) Clearly, it is crucial to control the mortality that will occur in order to maximize the benefit to the company of offering this rider. There are several ways to do this, aside from underwriting, but we will not cover them here. The important point is that, having done so, we could possibly offer a very attractive benefit indeed.

Conclusion

Because the EEDB rider is countercyclical to not only the base annuity product, but also to most other guarantees currently offered on variable annuities, two things seem clear:

- This rider offers some degree of risk management, as we have demonstrated in our admittedly simple example. This alone should make this rider very popular for insurance companies in the variable annuity market.
- It should be possible to offer this rider in such a way that it better meets its estate preservation goal. Caps on the benefit could be higher or maybe even non-existent.

We will see in the future how these ideas all play out.

Douglas L. Robbins, FSA, MAAA, is a consulting actuary at Tillinghast-Towers Perrin in Atlanta, GA. He can be reached at robbind@towers.com.

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have told us that they need. Design for Six Sigma (DFSS) is a methodology, or framework, for developing processes and/or products that meet customer needs. Design for Six Sigma for innovation (DFSS/i) is a sub-set of DFSS, focused on bringing new, innovative products to market. DFSS/i can be a powerful tool for successful product development.

The Need for Something Different

In today's environment, insurers are faced with having to develop product solutions to address increasingly complex risk management problems. Customers are more sophisticated and more demanding, and their needs are changing as quickly as market conditions. These factors, along with expanding global competition and a focus on growth contribute to a need for increased operational efficiency and increased innovation. Both of these require more effective use of ever fewer resources.

In this environment, successful insurance manufacturers are those who focus on unique product benefits and develop well-defined product plans, by using more non-traditional tools in market research, such as a team-based approach. By involving cross-functional teams earlier in the product development process, the following can be achieved:

- Direct access to customer knowledge;
- Ownership and buy-in across functions;
- Earlier detection of changing customer needs;
- Broader perspective in understanding the market; and
- Faster time-to-market of the new product.

The use of cross-functional teams is fundamental to the successful execution of any Six Sigma project.

DFSS for Innovation

GE uses DFSS/i to lower the risks and the costs associated with new product innovation. DFSS/i is a data-driven approach to assessing business opportunities and

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