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The Actuary

Editorial

Feeding the sheep

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The final actuarial work of the renowned Briton, Frank Redington, was a series of essays called "The Flock and the Sheep." They were reviewed here some months ago by Kenneth Stewart.

These articles describe what could be characterized as the problem of incidence of earnings on invest-ments in equities. While equities produce the greatest returns over a long time, they tend to have lower returns than debt for the first years of the investment. If a company makes substantial equity investments, then its long-term financial position should be enhanced by the long-term asset appreciation – the policyholder surplus would be increased and "The Flock" would be cared for. However, during the holding period the current returns would be less than if debt had been held and policyholder dividends also would be less – "The Sheep" would not be fed.

Redington phrased his problem in terms of the British bonus distribu-tion system for with-profit business. Our equivalent would be dividends on participating business. The same considerations apply to the declared rate on interest-sensitive products. If we have an asset that will produce a below-debt return over the next 10 years, followed by a balloon profit that produces a greater total return than the expected return on debt for the same period, how should its earn-ings enter into the declared rate on the product?

Many actuaries take the position that interest-sensitive products should be backed only by debt instruments with predictable returns. This simpli-fies the problem, but avoiding these fuzzy assets also eliminates the highest return producing assets from the investment portfolio. Reducing your realizable return to avoid a problem of incidence of earnings should not be the right answer.

A rational answer can be reached by considering the required return on capital for the company involved and noting how the incidence of earnings problem affects our capital. Let's consider the example of an equity

investment in real estate in an interest-sensitive segment of a general account. (Real estate fits right in with the sheep analogy. Grass feeds sheep, and it grows on real estate. Taking care of the flock means increasing the size of the pasture...I fear this analogy will carry us beyond the pasture and then some.)

Every company has a necessary return on capital. For a stock company, that return may be dictated by the cost of capital in the capital markets. For a mutual company, that return on capital may be dictated by a desire to maintain a certain ratio of surplus to liabilities and therefore be determined by the expected growth rate of the company. Capital might be Statutory or GAAP or some kind of management invention. Nonetheless, there is a defi-nition of capital used within a company, and there is a rate of return that management believes that the company should get on utilized capi-tal. This is the number used in the James C.H. Anderson method of premium calculation.

Let's do a simple illustration. So that I have a better chance of doing it correctly, we will ignore taxes. (I like to ignore taxes. I do it whenever I can.) Consider a property purchased for $1 million that will produce earn-ings of $60,000 at the end of each year for 10 years. At the end of the tenth year it will be sold for $2 million. The sales price can be made plausible by assuming that the leases that limit rents have run off. The cash on cash return expected on the building will be 11.76%. However, if we assume depreciation each year of 2% of the original cost, then the return on our books will be only 11.13%. Even though the cash flows have not changed, our surplus has not benefited from the return because of the write-down in the value of the asset. The total is the same over the years, but the incidence of recognition of earn-ings is different.

What rate should we begin with for the development of our credited rate? Let us call this the Equivalent Level Rate (ELR). If this ELR exceeds the book returns in any year, then

our surplus is reduced by that amount. Let us assume that invest-ments of surplus need to earn 15%. The present value of the ELR must then equal the present value of the book returns over the expected holding period of the asset using the needed surplus rate of 15%. For the asset described, the ELR is 9.91%, according to our assumptions.

The same general approach can be used with respect to risky assets. If we believe that we should have set aside 10% of the value of a risky asset as C1 risk reserve, then we would need a 15% return on that surplus. We should look at such surplus as being invested in the riskless asset of T-Bills – which might return 10%. The addi-tional 5% on the surplus must come from the risky asset. The return on the risky asset must then be clipped by 50 basis points (10% of the addi-tional 5%), which should go directly into capital to maintain the needed return on capital.

Elaborations of this scheme are easy to develop. Taxes can be included. That's messy but not really difficult. There can be combinations of risk and incidence that will involve further complications. Convertibles have these two characteristics that do not involve depreciation. The appro-priate cost of capital for use in this calculation can be debated. Why should it be different from that used in the premium calculation? Should it be the same for all uses, and should it be based on GAAP or Statutory book-keeping? For a mutual company, should the number change each year depending on changing views of the long-range needs of the company or be set at some stable value?

The nice thing about this approach is that it allows the develop-ment of a rational and consistent relation between the company's finan-cial needs as developed in strategic plans and financial markets, and the way in which fuzzy assets should enter into dividend and crediting strategies. I also hope it provides some useful method of feeding the sheep while caring for the flock.