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CHANGING ROLE OF THE VALUATION ACTUARY

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The Federal Reserve Board's battle against the bout of high inflation that began in the late 1970s and the partial deregulation of depository institutions in the 1980s brought on a period of high and volatile interest rates. This accelerated the trend already underway within the life insurance industry to unbundle the various risk elements in traditional whole life and annuity products and to lay bare the investment return component of cash value buildup. A host of new "interest sensitive" products that credit interest on an indexed or a new-money basis were introduced in order to seize on this market "opportunity" of high interest rates.

Actuaries involved in pricing the new products or in examining reserve and/or surplus adequacy have discovered that it is not necessarily conservative to assume a low interest rate for discounting cash flows. The low-rate view presumes that the insurer has invested policyholder funds in assets shorter than the liabilities and is therefore subject to the risk that asset cash flow will have to be reinvested at yields too low to support the interest rate guarantees made to policyholders. An equally significant risk, however, is that interest rates rise while liabilities mature (or roll over into new rate guarantees) and asset cash flow is insufficient because policyholder funds were originally invested in long-term instruments.

The Society of Actuaries, realizing that the presently existing valuation laws and regulations might not always lead to adequate policy reserves if the duration and other cash flow characteristics of assets and liabilities were not well matched, established the C-3 Risk Task Force in 1981 to develop methodology for evaluating life insurers' exposure to the risk of loss due to adverse changes in interest rates. The C-3 Risk Task Force fulfilled its basic charge and presented most of its findings during 1982 and 1983. The Task Force found it important to focus on items of asset and liability *cash flow* and to make appropriate assumptions as to how those cash flows (cash surrenders, premium payments, policy loans, prepayments of principal, and so on) are likely to depend on the course of interest rates. It recommended that the valuation actuary then project the financials for the product line, general account segment, or entire company, as appropriate, under various investment strategies and along various scenarios of interest rates.

The sensitivity analysis described above is meant to indicate what investment strategies the insurer should pursue and how bad financial results can actually be for the "worst" of a set of reasonably likely scenarios and for the "worst" of a larger set including less likely but still plausible scenarios. As a result of these calculations, the valuation actuary is presumed to be in a position to indicate *what level of reserves and surplus is needed to assure that asset cash flows make good and sufficient provision for the liability cash flows.*

Some actuaries involved in the effort to embed C-3 risk methology in new valuation laws have begun to question whether or not the valuation actuary will ever be in a position to give an *unqualified* opinion on the "sufficiency" issue. (In the Shapiro-Radcliffe-Leckie "trials" at this year's St. Louis spring meeting the matter was argued in a clever and entertaining fashion.) The primary difficulty is that there are many contingencies outside the actuary's control:

1. Interest rates might follow a course significantly different from any of the scenarios studied.

2. The cash flow experience might develop quite differently from the assumptions used in the valuation.

3. Investment portfolio managers might execute an investment strategy rather different from those analyzed or recommended.

These legitimate objections do not mean that C-3 methodology does not provide useful clues about exposure to interest rate risk — merely that it does not allow actuaries to make statements with absolute certainty regarding company solvency. I believe that actuaries should continue to be required to certify that prescribed valuation calculations have been performed accurately and to display the results of such calculations in the manner required by law or regulation. Where significant C-3 risk could be involved, the valuation calculations should be based on appropriate C-3 risk methodology and the results displayed in a manner that highlights the degree of reserve and surplus adequacy. Unqualified actuarial opinions about such adequacy should be avoided, however.

I feel strongly that the language used in laws, regulations, guidelines, and standards bearing on actuarial valuation requirements should be broad enough to permit (if not require) the use of new, improved techniques to measure exposure to C-3 risk. There is evidence that powerful new methods may be just around the corner. Arnold Dicke's letter to *The Actuary* on "Paradigms" (November 1984) and Robert Clancy's recent *TSA* preprint "Options on Bonds and Applications to Product Pricing" speak to the need for pricing and valuation actuaries to understand interest rate options. Recent work in academe and on Wall Street has suggested that the principles of option-pricing theory can be used to compute the present value of a stream of *interest-sensitive* cash flows. That theory complements the simpler, but equally useful, theory of the term structure of interest rates that develops the concept of *spot rates* needed to discount a stream of *certain* cash flows properly. Term structure theory is well known to academicians and investment professionals. Actuaries can learn its basic principles by reading Paul Milgrom's recent *TSA* preprint "Measuring the Interest Rate Risk."

Present values lie at the heart of actuarial science and actuarial practice. The two fundamental components of all discounting calculations are survivorship and time value of money. With respect to the survivorship (life contingencies) part of the calculation, the Society of Actuaries has recently incorporated "modern" concepts into its educational material. The same must now be done with respect to the time value of money (interest) part of the calculation — as mentioned above, term structure and option pricing concepts in the theory of finance hold the key. To have valuation actuaries adept at using these new techniques by the year 2000, we must take major steps within the next few years to revise the Society's E&E syllabus. We must be willing to take on this new challenge or we will forfeit part of our turf to other professionals possessing the necessary knowledge and skills. □