LIFE PRACTICE NOTE 1995–9
December 1995

Alternative Methods of Testing for Obligation Risk

Introduction

This practice note was prepared by a work group organized by the Committee on Life Insurance Financial Reporting of the American Academy of Actuaries. The work group was charged with developing a description of some of the current practices used by valuation actuaries in the United States. This work group was originally formed in 1992 and issued the first set of Life Practice Notes that year; changes have been made to this set of practice notes on an annual basis to reflect additional information on current practices.

The practice notes represent a description of practices believed by the work group to be commonly employed by actuaries in the United States in 1995. The purpose of the practice notes is to assist actuaries who are faced with the requirement of adequacy testing by supplying examples of some of the common approaches to this work. However, no representation of completeness is made; other approaches may also be in common use. It should be recognized that the information contained in the practice notes provides guidance, but is not a definitive statement as to what constitutes generally accepted practice in this area. Moreover, these practice notes are based upon the model Standard Valuation Law of the National Association of Insurance Commissioners (NAIC). To the extent that the laws of a particular state differ from the NAIC model, practices described in these practice notes may not be appropriate for actuarial practice in that state. This practice note has not been promulgated by the Actuarial Standards Board, nor is it binding on any actuary.

The members of the work group responsible for the original practice notes are as follows:

Donna R. Claire, chairperson

Arnold A. Dicke
Douglas C. Doll
Craig F. Likkel
Linn K. Richardson
Henry W. Siegel
Steven A. Smith
Stephen J. Strommen
Charles N. Vest
Michael L. Zurcher

LIFE PRACTICE NOTE 1995–9
December 1995

Additional review for the 1995 Life Practice Notes was provided by the following members of the American Academy of Actuaries' Committee on Life Insurance Financial Reporting:

Donna R. Claire
Andrew R. Creighton
James E. Hohmann
Michael J. O'Connor
Frank W. Podrebarac
Meredith A. Ratajczak
Henry W. Siegel

Comments are welcome as to the appropriateness of the practice notes, desirability of annual updating, validity of substantive disagreements, etc. Comments should be sent to Donna R. Claire at her Directory address.

Q. What is *obligation risk*?

A. *Obligation risk*, as defined in Actuarial Standard of Practice (ASOP) No. 22, *Statutory Statements of Opinion Based on Asset Adequacy Analysis by Appointed Actuaries for Life or Health Insurers*, is "the risk that the amount or timing of items of cash flow connected with the obligations considered will differ from expectations or assumptions for reasons other than a change in investment rates of return or a change in asset cash flows." This risk is commonly referred to as *C-2 risk*, or *pricing risk*.

Q. What type of sensitivity testing is commonly done?

A. A survey of appointed actuaries in the context of asset adequacy testing for year-end 1992 showed that 66% did sensitivity testing on lapse assumptions, and 53% did sensitivity testing on morbidity/mortality assumptions. Other types of sensitivity testing done on obligation risks included expenses, interest crediting strategies, dividends, reinsurance, amount of renewal premiums, and federal income tax assumptions.

Q. How does the appointed actuary typically decide on the scope of obligation risk testing?

A. The first step is to identify the material, or major, risks under the category of obligation risk. A review of sensitivity analyses from prior pricing and/or projection work, combined with the appointed actuary's general knowledge of the product line(s), might provide the basis for identification of the material risks. In then deciding on the scope of testing, the actuary generally will consider the potential volatility of future experience, the significance of any variance in terms

of its effect on results (i.e., ending surplus), the existence of any repricing capability for nonguaranteed elements, and any interrelationships with asset, investment-rate-of-return, or other obligation risks. The obligation risks to be considered in this manner generally include mortality (including potential AIDS claims impact), morbidity, lapse, and expense risks. While both favorable and unfavorable deviations in future experience are possible, many actuaries believe the appointed actuary's primary concern should be the potential for adverse deviation with any obligation risk.

Q. What are some alternative methods of testing for obligation risk in an asset adequacy analysis?

A. At least three general methods are available, each with significant potential variations in application to any particular company or line of business. The three methods described in this practice note are as follows:

1. scenario-specific testing,
2. sensitivity testing, and
3. health claim liability methods.

Q. What is meant by *scenario-specific testing for obligation risk?*

A. As the name implies, *scenario-specific testing* involves the development of specific, alternative obligation risk scenarios within the context of cash flow testing for investment-rate-of-return risk and/or asset risk. While actuaries generally think of variations in economic and/or interest rate assumptions when considering alternative scenarios for cash flow testing, it is also possible to incorporate variations in key components of obligation risk. A *scenario* is, in fact, defined as "[a] set of economic and operating assumptions on the basis of which cash flow testing is performed," in ASOP No. 7, *Performing Cash Flow Testing for Insurers*. Variations in key assumptions with respect to obligation risk can be considered as part of the scenario's *operating assumptions*. Such variations in scenarios can be generated using either stochastic or deterministic methods, similar to the different methods used to develop variations in interest rates. The actuary is prudent to take care in the development of scenarios to keep the number to a manageable size that is still sufficient to reflect a range of conditions for all of the important categories of risk.

LIFE PRACTICE NOTE 1995–9
December 1995

Q. What is meant by *sensitivity testing for obligation risk?*

A. In the context of an asset adequacy analysis, sensitivity testing of nonasset-related variables can be utilized to demonstrate the adequacy of reserves with respect to obligation risk. The sensitivity tests are designed to be applied after the completion of a basic set of scenarios involving different economic assumptions that are primarily focused on testing for asset and/or investment-rate-of-return risk. This approach would involve, for each significant type of obligation risk, determining the range of variations of the base assumption that has a reasonable possibility of occurring. The scenarios typically would then be rerun to determine the impact of such variation.

Certain combination sensitivities can also be tested in order to evaluate the impact of potential combinations of adverse experience.

Q. What is meant by using health claim liability methods for obligation risk testing?

A. Health claim liability methods are described in ASOP No. 5, *Incurred Health Claim Liabilities*, and include tabular methods, development methods, and loss-ratio methods. These methods are usually applicable to health insurance and similar lines that involve liabilities which are largely insensitive to the level of interest rates.

The key concerns of the appointed actuary typically are as follows:

1. the method is applied consistent with the standard to provide a reasonable estimate of the liability;
2. the liability or reserve can be demonstrated to be insensitive to interest rates and/or the choice of assets backing the liability (a going concern assumption may be involved here); and
3. the method is validated and/or updated regularly based on follow-up studies and updated experience analysis.

More detailed descriptions of health practices can be found in Health Practice Notes 1995–1 through 1995–9.

LIFE PRACTICE NOTE 1995–9
December 1995

Q. Are the results of sensitivity testing shown in the actuarial memorandum?

A. In a survey of 1992 practices, slightly over one-half of the appointed actuaries stated that the results of the sensitivity tests were shown in their memoranda.

A group of actuarial regulators has met several times in 1993, 1994, and 1995 at the NAIC meetings to review 1992, 1993, and 1994 memoranda. One outstanding criticism was that either sensitivity testing was not done, or that the results of the testing were not discussed in the memoranda.