
SOCIETY OF ACTUARIES

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## *ARIA promotes cont'd*

growing segment of the ARIA membership is increasingly committed to i) requiring that even quantitative articles be written in a manner which facilitates understanding and ii) devoting a larger proportion of the *Journal* to nonquantitative topics.

D. Support for Book Awards

Each year, ARIA selects two of the best books on insurance or related matters published in the previous year and presents cash awards to their authors at the annual meeting. The purpose is to encourage high quality publications about insurance.

E. Specific Assistance to University Insurance Professors

Two recent annual meeting sessions have been designed to improve the quality of insurance teaching. The first was an annual seminar on pedagogical techniques sponsored by the Insurance Information Institute. It provided a forum for leading educators to assist members with their teaching techniques. The second is the recently instituted Pedagogical Seminar. In this seminar, leading scholars in insurance and related disciplines present summaries of cutting edge topics related to the teaching of insurance. The intent is to encourage and assist professors to incorporate these topics into their classes.

F. Encouragement of Academic/ Industry Interaction

Industry leaders are encouraged to attend ARIA meetings; in some instances, personal invitations are sent to officers of industry associations and they are accorded special guest status. In addition, ARIA provides funding for its president to accept invitations to industry association meetings.

In an effort to increase communication between the two organizations, SOA staffed a round-table discussion of current research issues at ARIA's annual meeting August 14-17 in Reno.

**Curtis E. Huntington is Corporate Actuary with New England Mutual Life Insurance Company, Boston. A past General Chairperson of the E&E Committee, he is now a member of the Education Policy Committee, the Research Policy Committee and the Board of Governors.**

# Executive Committee and Board of Governors report of significant actions

by Anthony T. Spano

**Executive Committee – March 8-9, 1988 – Phoenix**

For the second ballot of the Society's 1988 elections, the Committee approved a classification of candidates and continuing Board members by area of practice. Included as areas of practice would be such categories as insurance company, insurance consultant, pension consultant, health consultant, and teaching. The objective is to achieve appropriate representation from each major segment of the membership on both the Board and the Executive Committee.

**Board of Governors – May 18, 1988 – Louisville**

The Board accepted the final report of the Task Force to Revitalize Society Research. In accordance with Task Force recommendations and as part of additional efforts to strengthen significantly the role of research within the Society, the Board:

- Approved creation of a Research Development Fund to accept donations and grants to be used for initiating and developing research activities and programs approved by the Board.
- Approved provision of $25,000 for specific worthwhile research projects identified by the Research Policy Committee, to be made available for expenditure on the approval of the Executive Committee.

The Board authorized the appointment of a joint committee with the Casualty Actuarial Society to articulate actuarial principles. It also received the final report of the Committee on Life Insurance Company Valuation Principles, authorized that the report be made available to the Society membership upon request, directed the Committee to turn its report over to the new Actuarial Principles Committee for its consideration, and discharged the Committee with thanks.

**Anthony T. Spano is Actuary, American Council of Life Insurance. He is Secretary of the SOA.**

# A means of comparing unit reserves on different valuation bases

by Henry R. Ramsey, Jr.

The heightened interest and concern with respect to statutory valuation bases and the increasing emphasis on effective-management-basis financial statements have resulted in a greater need for a means to compare different reserve bases. Formula B in Table 1 enables a duration-by-duration comparison of the components of the calculation of two different valuation bases (one designated by primed values, the other by unprimed values).

*(Ed. note: The 14-step derivation of the formula, not printed here, can be obtained from the author at his* Yearbook *address. The derivation makes use of, among others, formula A [see Table 1].*

*The author explains that this is general formula, expressed in a form suitable for use with reserves on a "level-return-on-equity" [level ROE] basis. A paper describing the level ROE reserve basis was distributed to Financial Reporting Section members in February 1987).*

**The Generalized Comparison Formula**

The generalized comparison formula (formula B – see Table 1) assumes that the unprimed reserves ignore taxes and do not take into account that the company may require a return on its invested assets that differs from the expected investment earnings rate. Thus, unprimed reserve bases could include statutory and GAAP valuation bases as currently defined.

This formula says that the difference in reserves at a given duration (using "new" for primed values and "old" for unprimed values) is equal to the present value at the new valuation rate of the following at each future duration:

(a) the excess of the new valuation rate over the new interest rate times the new asset value at the beginning of the year

minus (b) the excess of the new valua-

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tion rate over the old valuation rate times the old reserve value at the beginning of the year

minus (c) the excess of the new insurance cash flow for the year over the old cash flow for the year

plus (d) the provision for taxes for the year.

### Definitions

$\sum_j$ = sum for all positive integral values of j

r = the valuation interest rate

$v_r = 1/(1 + r)$

i = the annual pretax investment earnings rate assumed in the valuation

$A_j$ = the amount of interest-earning assets assumed in the valuation for duration j; e.g., total investment earnings assumed for the year divided by i

$\Delta_j$ = insurance cash flow received during year j, defined as all cash flow assumed to be received in the valuation other than investment earnings and taxes

m = zero for stock companies and the "differential earnings rate" as defined in the current federal income tax law for mutual companies

T = the marginal tax rate applicable to earned income over the future life of the contract

$z' = [r' + m \cdot (1 + r'/2)] \cdot T/(1 - T)$

${}^TV_j$ = the tax-basis pretax net-contract-liability at duration j.

This formula assumes that the reserve includes all asset and liability items related to the contract other than any deferred tax liability reserve; therefore, it is net of such items as due and unreported premiums and deferred acquisition cost and includes any provision for policyholder dividends. It is assumed that a deferred tax liability will be established in an amount equal to:

$T \cdot ({}^TV_t - V_t)$.

### Some Comparison Examples

First, let's look at a comparison of a "level ROE" reserve basis to a stock GAAP reserve basis. In the initial look, let's assume that taxes are equal to zero, that the product was priced to produce a return on capital equal to the pretax investment earnings rate, and that both valuations use the same margins for adverse deviation. In the formula, the final term related to taxes drops out, and since $r' = i' = r$, the first two terms drop out. That leaves us with the difference in insurance cash flow. Since the values of these two reserves should be zero at issue, the insurance cash flow on the ROE basis must be the same as on the GAAP basis. This in turn means that when the level percentage-of-premium profit was calculated for the GAAP basis, it would have turned out to be zero. Thus, a company that prices to return the level ROE equal to the gross investment earnings rate will find that its level percentage-of-premium profit amount is zero and that the proper rate of return will be generated from the financial statement except for tax considerations.

Let's now look at the same situation except that taxes are recognized in calculating the expected return on capital in pricing. In this case, there will be a percentage-of-premium profit factor in the GAAP calculation, and its present value at issue must be equal to the present value of the tax burden shown as the last item in the formula. In considering the incidence of the differences in reserves, it would appear likely that the level ROE reserves will be somewhat higher than the stock GAAP reserves because the quantity in parenthesis in the tax item, when expressed on a per-thousand insurance-in-force basis, is generally sloped upward by duration as compared to the percentage-of-premium factor being constant.

An additional question that might be asked is what level ROE after taxes will result if the percent-of-premium profit provision in the GAAP formula is zero. The answer is that the level ROE rate will be equal to the net-after-tax earnings rate on investments, since the durational factor in the formula reduces to $(r' - i' + z')(A' - {}^TV)$. Since the present value of this quantity must be zero at issue, this means that r' must equal $i' - z'$, and examination of that result gives the answer indicated.

To do a proper "level ROE" valuation, including the recognition of taxes, it is necessary to be sure that the values of i and $\Delta$ are on a fully-taxable-equivalent basis. This means that the interest rates on tax-favored investments need to be adjusted accordingly, and the difference in marginal tax rates on some of the insurance cash flow components should be recognized in order to give a fully adjusted result. For a mutual company, this would mean increasing policyholder dividends significantly in order to recognize the additional tax cost that is associated with the dividend treatment in the federal income tax law.

Note that the formula tax provision includes a portion of the "surplus tax" incurred in the year prior to the valuation, and some offset provision is necessary to avoid double counting. This can be accomplished by reducing the reserve ($V_t$) by:

$$\frac{[m \cdot T/2 \cdot ({}^TA'_t - {}^TV_t)]}{(1 - T)}.$$

**Henry B. Ramsey, Jr., is a retired Vice President of The Penn Mutual Life Insurance Company. He has been actively involved in accounting and related matters in both professional and industry circles and was for several years on the Council of the SOA Life Insurance Company Financial Reporting Section.**

## TABLE 1

**Formula A**

$$V'_t = A'_t - \sum_j v'^j_r \cdot [A'_{t+j-1}(1 + i') + \Delta'_{t+j} - z' \cdot (A'_{t+j-1} - {}^TV_{t+j-1}) - A'_{t+j}]$$

**Formula B**

$$V'_t = V_t + \sum_j v'^j_r \cdot [(r' - i') \cdot A'_{j+t-1} - (r' - r) \cdot V_{j+t-1} - (\Delta'_{j+t} - \Delta_{j+t}) + z' \cdot (A'_{j+t-1} - {}^TV_{j+t-1})]$$