Meeting life insurance needs: 1970-1990

By Christian J. DesRochers

At an antique show a few years ago, my wife Carolyn bought a letter signed by Calvin Coolidge while he was governor of Massachusetts. It now hangs on my office wall as a fitting reminder of why the life insurance industry exists. It reads:

There are certain obligations that every man owes to his family, his business, and his country. He owes it to his family that they shall not be left dependent upon charity. He owes it to his business associates not to allow the business to collapse by the loss of his personal attention. He owes it to his country that the government shall not be deprived of its supporting taxes through the shrinkage of his estate. There is one way in which all men can fulfill each of these duties. That is by life insurance. In this day and generation, it would seem there is no greater blessing to prepare us against the future than life insurance. I believe in it sincerely and feel that no man can fail to take advantage of its proven benefits.

While most people in the life insurance industry would agree with Coolidge's sentiment, measuring whether the life insurance industry is meeting the public's insurance needs is more difficult. By comparing statistics from the *American Council of Life Insurance (ACLI) Fact Book* with economic data from the Federal Reserve Board, it is possible to obtain some measure on a macro basis by looking at life insurance growth relative to overall asset and income growth.

In the United States, during the 20 years from 1970 to 1990:

- Life insurance in force as a percentage of disposable personal income increased from 208.7% in 1970 to 276.0% in 1990; for ordinary insurance, the percentages were 107.6% in 1970 and 166.0% in 1990.
- Life insurance in force as a percentage of household assets increased from 41.1% in 1970 to 53.1% in 1990; for ordinary insurance, the comparable percentages are 21.2% in 1970 and 32.0% in 1990.
- Life insurance in force as a percentage of household net worth increased from 47.5% in 1970 to 65.5% in 1990; for ordinary insurance, the comparable percentages are 24.5% in 1970 and 39.4% in 1990.
- Life insurance death benefits as a percentage of disposable personal income declined from 1.0% in 1970 to .6% in 1990.
- Life insurance premiums as a percentage of disposable personal income declined from 3.0% in 1970 to 1.9% in 1990; for ordinary insurance, the percentages declined from 2.2% in 1970 to 1.5% in 1990. The 3% rate was nearly constant for the previous 20 years from 1950 to 1970.

From 1970 to 1990, the growth rate of insurance in force has outpaced growth in both disposable personal income and net worth. In force as a relative percentage of both disposable income and household net worth increased by more than one-third during that period. By 1990, the total life insurance in force represented slightly more than twice the gross domestic product (GDP), while in 1970 it was about 150% of the GDP.

This indicates that the life insurance industry has been successful in increasing the amount of life insurance in force in the economy relative to relevant economic measures. Is this increase enough? Although slightly more than 2.75 times disposable income is "insured," conventional wisdom is that three times one's disposable income merely provides for transitional security. With today's dual income families, it may be adequate. This increased amount of life insurance, however, represents only two-thirds of household net worth. Although the life insurance industry share has increased on a macro-economic basis, significant amounts of net worth and possibly disposable income remain that are "uninsured."

Although life insurance in force has grown as a percentage of disposable income, the rate of death benefit payments has declined. The life insurance in force has become a deferred source of wealth, which at some point will flow back to the economy.

The decline of life insurance premiums as a percentage of disposable income is expected, because it generally follows the reduction in mortality seen during the period. During the period, consumers increased their relative life insurance protection as measured by both disposable income and net worth. Some unpublished ACLI data on the percentage of individual annuities that are nonqualified lend support to the idea that some of the decrease in life insurance premiums may have been reallocated to individual nonqualified annuities. Reductions in the proportion of income allocated to life insurance have been offset by increases in the proportion allocated to individual nonqualified annuities. As a result, the combined share of life insurance and individual nonqualified annuity premiums was about 3% of disposable income in both 1980 and 1990. This was exactly the share of disposable income allocated to life insurance alone before 1970.

It may be, in the aggregate, that 3% of disposable income is the limit to which consumers will allocate monies to the life insurance industry in the form of life insurance and non-qualified annuity premium. If this is the case, then long-term premium growth is tied to increases in disposable income. Over the past several years, the rate of growth in disposable personal income has been declining. From 1985 to 1990, the compound rate of growth in disposable personal income was 6.6%; from 1980 to 1985, disposable personal income grew at a 8.5% compound growth rate. A clear implication is that, unless the insurance industry can increase its "historical" share of disposable income, then its rate of growth will be limited by increases in disposable personal income.

Further, the growth in nonqualified annuity premiums may not represent net "new" dollars flowing into the insurance industry, but a reallocation

Research papers for Fellowship credit

by Roy Goldman

The Education and Examination Research Papers Committee has awarded 30 Fellowship credits to Virginia R. Hosler for her paper, "The Application of Fuzzy Sets to Group Health Underwriting." This is the sixth paper approved for Fellowship credit under the Flexible Education Methods (FEM) program.

The abstract for this paper is as follows:

> Fuzzy sets are used to model the process of selection in group health insurance. In general, fuzzy set theory is implemented to describe collections of objects whose boundaries are not precisely defined, as in the judgment of what constitutes a good risk group. First, single-plan underwriting is considered; then the work is extended to multiple-option plans.

Copies of Hosler's paper are on file in the Society library. Members interested in reading this paper can contact Donna Richardson, the staff librarian.

The committee thanks Krzysztof Ostaszweski, Brian Schott, and Jean Lemaire, who refereed this paper, and acknowledge Joseph W. Michel, who served as Hosler's supervisor and provided the committee with a review.

Students interested in the research papers program should consult Appendix 2 of the Fellowship catalog. Applications for research papers can be obtained from the Society of Actuaries' office.

Roy Goldman is Examination Chairperson of the Research Paper Committee and vice president and actuary, The Prudential Insurance Company.

Society awards Ph.D. grants

The Society of Actuaries recently awarded $10,000 grants to four Ph.D. candidates conducting research on actuarial science topics for the 1992-93 academic year. The new grant recipients are James Carson, University of Georgia; Shuxun Wang, University of Waterloo; and Hal W. Pedersen, Washington University, St. Louis, Missouri. Margie Rosenberg, University of Michigan, a new grant recipient in 1991-92, was awarded the grant for a second year. Grants are renewable up to three additional years.

Carson's thesis topic is on the early identification of life insurer financial distress. Wang is using linear recurrence equation theory as a basis for his thesis topic to clear up some concerns in modern risk theory, such as instability and inefficiency in numerical evaluation of insurance claim distributions. Pedersen's research involves using option pricing theory and term structure of interest rates, two areas at the core of modern financial theory.

The deadline for Ph.D. grant applications for the 1993-94 academic year is March 15, 1993. For more information, call Warren Luckner, research actuary, at the Society office, 708-706-3572.

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of the historical savings share from life insurance. Considering life insurance and nonqualified deferred annuities as "personal" insurance, the industry has not significantly increased penetration of the market beyond the "3% barrier" in nearly a half century. Barring significant increases in the share of income allocated to life insurance, prospects for growth in the life insurance market appear to be tied to growth in the economy, specifically, growth in disposable income.

Some observers have written that life insurance is a mature industry, and rates of growth will be limited in the future as a result. An alternative conclusion supported by the data is that growth in the life insurance industry historically is tied to growth in disposable personal income. Regardless of what people believe about the "go-go" 1980s, the rate of growth in disposable personal income was higher in the 1970s than it was in the 1980s. The challenge of the life insurance industry is to increase the share of income directed toward our products and services. In the past, growth in personal income sustained growth in the industry. In the future, growth will result from improving the ways in which we define and meet consumer needs.

Christian DesRochers is a consulting actuary with Lautzenheiser & Associates and currently Chairperson of the Individual Life and Annuity Product Development Section Council.

Position paper available

The Society of Actuaries' Board of Governors has charged the Annuity Valuation Table Committee with developing a recommendation for a new Group Annuity Mortality Valuation Standard.

The committee has met on an ongoing basis, studied the available data, and discussed how to complete its charge. As a result, it believes a new approach is warranted; that is, generational mortality should be explicitly incorporated in any new standard eventually adopted.

Because the decision to incorporate generational mortality is ground-breaking, especially when compared to previous efforts, the committee produced a position paper. It is designed to explain the reasons for selecting the generational mortality approach and to encourage comments and suggestions from industry professionals about the suggested use of this approach.

The paper also briefly discusses some developmental steps being considered by the committee. They include:

- Determining the sensitivity testing approach and coverage considerations appropriate for the development of margins for the new standard