



SOCIETY OF ACTUARIES

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ACTUARIAL DEMOGRAPHICS I

By Dwight K. Bartlett, III

Since 1985 was the silver anniversary of the class of 1960 FSA's, it seems appropriate to review what has happened in the past 25 years to these 60 men and one woman who were members of that class. The following is based on information largely determined from the 1961 and 1985 Society of Actuaries' *Yearbook*.

In 1961 and in 1985 the distribution by type of employer is as shown in the following table:

	1961	1985
Academia	1	1
Consulting Actuaries	8	23
Government	0	1
Life Insurance	52	28
Retirees	0	4
Resignations	0	2
Deaths	0	2
	61	61

Noteworthy are the following: Eighteen still work for the same employer, a high degree of employment stability; paralleling what is happening in the profession generally, the shift to the consulting sector is quite strong; normal mortality expectations would call for three or four deaths, so we have apparently been a healthy bunch; the 53 of us still in active employment can only envy the four retirees; during the next decade, presumably most of us will move into that category.

The following table shows the distribution of those employed by life insurance companies according to title.

Presidents	4
Executive Vice Presidents	4
Senior Vice Presidents	4
Vice Presidents	9
Assistant Vice Presidents	2
Other	5
	28

Apparently we are a talented and hard-working bunch. It is more difficult to determine status by title in the consulting industry, but it should be noted that ten of the 23 employed as consultants work for firms whose name incorporates their own name. Obviously we have our share of entrepreneurial types who dislike working for other people.

The following table indicates the geographical distribution of class members of 1961 and 1985:

	1961	1985
Canada	8	9
Central	11	6
Northeast	32	27
South	7	10
West	3	5

Actuaries, like the rest of our population, have been attracted by the comforts of life in the sunbelt regions of the South and West. On the other hand the strong pattern of net migration from Canada to the United States, which took place in the years following the Second World War, apparently had pretty much died out by 1961.

Normally 50% of a normal American population have an initial of their last name falling in the range A through K and the balance L through Z. For some strange reason, in our class 40 of the 61 fall in the range of A through K. Does anyone have a theory explaining that statistical oddity? □

ACTUARIAL DEMOGRAPHICS II

By—Preston Bassett '36

Stanley Olds '42

Linden Cole '51

Bob Hardin '59

Gary Dahlman '60

Forrest Richen '62

Kathleen Burt '69

Can you imagine a large U.S. city more remote from the major centers of the insurance business than Portland, Ore.? Yet, Grant High School, just one of the several high schools in that city, has produced at least seven actuaries since 1936.

Grant is not a technical school; neither its curriculum nor its middle class neighborhood suggests a fruitful source of actuaries. Nevertheless, given at most 500 graduates a year on the average from 1936 to 1975 (a reasonable cutoff year considering the "travel time" from high school graduation to FSA), the production rate exceeds 0.35 FSA's per 1,000 graduates. The comparable figure for the nation is surely less than 0.06 FSA's per 1,000 graduates, (5,208 FSA's on 11/1/84 divided by a conservative estimate of surviving high school graduates from that period of about 91 million).

While we don't think our group is large enough to form an SOA section, we are proud of our high school and would like other Grant High School

SHORT COURSE ON

ACTUARIAL MATHEMATICS

By Abdul Hoque

The American Mathematical Society (AMS), in conjunction with its eighty-ninth summer meeting, presented a one-and-one-half day short course entitled "Actuarial Mathematics" on Aug. 10 and 11, at the University of Wyoming, Laramie. The course was one of a series given by the Society on the recommendation of its Committee on Employment and Educational Policy (CEEP). As a student participant, I think it was a successful short course for a research oriented actuary. Also, it was a good opportunity for professional actuaries to exchange research ideas with the academic actuary doing teaching and research. I am writing this report for those members who were unable to attend the course, and to give an outline of the materials presented in the meeting.

In the introduction, James C. Hickman (University of Wisconsin) introduced himself and all other guest speakers. His lecture introduced actuarial mathematics as a branch of applied mathematics devoted to building models of insurance systems. It is an old and successful application of mathematics in business and social sciences. He explained how actuarial models incorporate mathematics of life contingencies, which is the study of models used in life insurance and annuities. He also explained how expense and compensating premium loading can be added to the loss variable, and how the equivalence principle, that is, the expected present value of future losses, defines current liability, yields premiums and reserves. Indexed benefit and random interest concepts were explained with examples.

After Professor Hickman, Harry H. Panjer (University of Waterloo) presented his lecture on Models in Risk

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graduates to identify themselves. Moreover, we challenge other high schools to match our record. Can we learn something from Grant and other productive high schools about how to recruit future actuaries? □

LETTERS

Symposium

Sir:

The recent Symposium on "The Valuation Actuary" was an unqualified success. The efforts of the faculty and staff are to be highly commended! I am writing this letter to expand on a dialogue that was started during those presentations, but for which additional discussion time was not available. *The Actuary* might be a good forum for my remarks.

The period of time over which the various cash flow scenarios should be projected by the Valuation Actuary did not receive a great deal of discussion. Those presenting examples tended to use 20 years as a convenient period, and some observed that a longer period should be used when the amounts remaining after 20 years were significant. Many seemed to agree with the latter position, even though they acknowledged that longer projections would further complicate the already onerous process of multi-scenario testing. I would like to suggest another line of reasoning that has led me to the opposite conclusion.

First, we must look at two key characteristics of the projections we are proposing:

1. While static at the time they are made, the projections should really be reviewed as dynamic — they will be recalculated each year (or more frequently), and there will be no "lock-in" principle with regard to assumptions such as applied to GAAP, and . . .
2. the projections will ignore future issues.

The implication of the dynamic view of our projections, simply stated, is that we will approach that elusive 20th year value asymptotically. Each year we will re-project cash flows based on a new view of what may happen in the future, reflecting updated experience. Management will have ample time over that period to take corrective action to overcome any emerging adverse experience.

The primary argument advanced for using longer projection periods was the potential for significant amounts of business remaining in force after 20 years. However, in this sense, "significant" has been measured against the size of the original block of business 20 years earlier. When 20 years of new

business are included, it is difficult to see that any short-fall in the 20-year-old block would be material to the total company's surplus position.

From these points, I conclude that we could view 20 years as the normal, if not the maximum, projection period. Indeed, I can envision circumstances where periods as short as 10 years might be sufficient for a Valuation Actuary to accept as the basis for an informed opinion. Conversely, circumstances suggesting there will be little or no future business might require longer projections, but I consider this unlikely.

As a final thought, I can see merit to a "fail-safe" type of test that could be applied when short projection periods are used and/or small or negative surplus margins appear in early years. (It also might have some general applications.) This would consist of a few projections for a period of two or three years using assumptions which might be described as "worst plausible". This could act as an early warning to management, identifying the magnitude of adverse experience which would require early and/or severe corrective action.

Robert H. Dreyer

Short Course on Actuarial Mathematics*(Continued from page 5)*

theory. He gave a good mathematical view of the modeling of claims for an aggregation of risks. Theoretical justifications of the choices of models using concepts of mixing and compounding were given. Numerical examples for evaluation of total claims were presented.

Stuart A. Klugman (University of Iowa) explained how loss distribution comes into play in analyzing risks. He demonstrated that knowing the mean of the loss distribution is not significant. He then explained five methods of Parameter Estimation and concluded his lecture with the development of confidence intervals for those estimates.

Then P.M. Kahn gave a lecture on credibility theory. Basically Mr. Kahn gave a good overview of the literature.

E.S. Shiu then delivered a lively lecture on Graduation theory. He touched mainly on recent developments on the topic including Bayesian Graduation.

Finally, John A. Beekman (Ball State University) discussed Population Projections, and Dependency Ratio. He also talked about Economic Assumptions for Social Security projection and long range cost estimates for the OASDI system.

In my opinion, the course was fruitful and the seminar and discussions were lively. I think the Society should arrange similar workshops in the future to encourage more theoretical research.

An Even Shorter Course

A two-session minicourse entitled "Introduction to Actuarial Mathematics", organized and taught by Ellen Torrance, was a part of the Mathematical Association of America meeting in mid-January. □

Model Law

Sir:

The Model Standard Nonforfeiture Law as of 1980 has an interesting puzzle for those actuaries interested in puzzles and who would not mind spending a few hours (or days or weeks) in trying to find out how to apply the Model.

An especially interesting section attempts to limit cash values discontinuities, specifically section 10164.1 of the California Code and Section 8 of the Model. In discussions I have found few actuaries who have an interpretation, a few have a general explanation of the intent of the Section, and I must confess to a complete loss as to what the Sections means and how to apply it.

Do any readers have any specific approaches to use to determine whether a schedule of cash values complies with the requirements?

John T. Gilchrist

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