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The Newsletter of the Society of Actuaries

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CURRENT ISSUES IN ACTUARIAL EDUCATION

by Anna M. Rappaport, Vice President for Education and Examination

Actuarial education is a major activity and concern of the Society of Actuaries. Over the past decade, the Society has incorporated a number of changes in its education system so that the system as it now stands:

- allows actuaries to specialize in life, health, or pension actuarial matters, but still allows them to switch specialties as they go through the syllabus;
- provides different content for U.S. and Canadian actuaries;
- includes the mathematics which allows actuaries to recognize variance;
- is coordinated with the Joint Board for the Enrollment of Actuaries Examinations in the United States.

In spite of several syllabus changes and continual work on study material, there are still policy questions which must be addressed by the Society, as there always will be. Some of the major concerns today include:

How do we build the problem solving skills which will enable actuaries to identify and solve the unknown problems of the future and to communicate well about them?

What is the proper role of the computer in the educational process and how can today's technology be effectively used in actuarial education?

What are the most effective teaching methods for the future?

How are the needs of pension practitioners best served by the educational system?

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VICE-PRESIDENT TURNER RESIGNS, RUGLAND IS APPOINTED

I regret to announce that Sam Turner, recently elected as a Vice-President of the Society, has found it necessary to resign. Expressing his deepest personal apologies to the Society and its members, Sam cited business pressures in his position of President and CEO of Life of Virginia, and Vice President of its parent, Continental Group, following the latter's acquisition by private interests. Given Sam's significant contributions to the Society in the past, and his continuing commitment to the profession, I appreciate how difficult this decision was for him.

In accordance with the Society's Constitution, the Board of Governors has appointed Walter S. Rugland to serve as Vice-President for the balance of this year. We are fortunate that Walt is willing to take on this assignment on top of his already busy schedule. This fall Fellows of the Society will be asked to vote for a Vice-President to complete the remaining year of this term in addition to those usually elected.

Preston C. Bassett
President

THE STOCK MARKET: GETTING ABOARD THE BULL TRAIN

by Robert A. Nix

For those who care, there are both pleasure and profit to be gained from buying a ticket on the bull train in a timely manner. Doing it two or three months before departure, or just after the journey has begun, is the best way—your ticket costs more later on.

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NEW DISABILITY VALUATION TABLES

by William J. Taylor and *W. Duane Kidwell*

The report of the Society of Actuaries' Committee to Recommend New Diability Tables for Valuation was presented to the Board of Governors on January 15, and was authorized for an exposure draft to Society members. An abridged section of the report was mailed to all members February 1. The full report is available upon request to Mark Doherty, Director of Research, at the Society office. There will be a panel discussion of the Committee's Report at session PD46 at the Spring Meeting of the Society in San Francisco, April 1-2.

Notably different in this report is the parametric aproach used in the construction of continuance tables. Each variable that was found to be significant has been numerically quantitied in its relation to the other variables and is directly reflected by duration in the calculations. Although appearing complex at first glance, the approach is very simple and adds dimension and flexibility that enable the table to fit any company's mix of business. The tables are very practical to work with through simple computer programs. At this writing, the Society is attempting to make one or more software packages available which would compute continuance tables, net premiums, policy reserves and claim reserves for any defined set of variables (sex, cause of disablement, occupation class, elimination period, benefit period and interest rate). Cause of disablement is accident, sickness or a combination of both accident and sickness. The basis of the computation would be either the DTS Experience Table or the proposed DTS Valuation Table, each combined with

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EDITORIAL

ACTUARIES AND ACADEMIA

Outsiders observing the actuarial scene, especially those associated with one or another of the so-called learned professions, are continually amazed by the tenuous relationships between actuaries and academia. Doctors, lawyers, engineers, and accountants (among others) are trained in highly organized professional colleges affiliated with major universities. These same professional schools are the loci for the expansion of professional knowledge, and thus perform a second vital function. Not so as to the actuarial profession! Here strong professional *societies*, sponsoring a self-study system staffed by part-time 'volunteers', are the center for both education and research, while academia plays only a minor role.

This is neither the time nor the place to explore in depth why this unique situation exists. Our roots in the insurance industry of Great Britain have a bearing, as does our tiny relative size. Under the circumstances it is a bit surprising that university-based actuarial education programs even started in North America, but indeed they did. A handful of such programs, off to a good start in the first half of the 20th century, have achieved moderate success; but they have never developed to the point of playing the role of the typical professional school.

We have nothing but admiration for the 50 or so academic actuaries, scattered among some 25 institutions of higher education, who cope with the problems of attracting students and qualified faculty and offering a meaningful curriculum, while meeting the standards and the objectives of their academically oriented employers. University-based actuaries are expected to play a role in research as well as in education, and many strive to do so. But because they are so few and so scattered, such actuaries, sometimes productive as individuals, have not been particularly productive in total.

Recent issues of this newletter show us that the current situation, whether we view it supportively or critically, is not entirely static. James Murphy (October) tells us that a Society task-force is once again studying these and related matters. Linden Cole points out (January) that the situation is somewhat different in Canada. In another article (February) he tells us of recent strengthening of actuarial-academic relationships in Australia and in the United Kingdom. A Letter to the Editor (also February) gives a glimpse of the problems faced by university-based actuarial programs within the United States.

The Actuary, ever willing to encourage debate on interesting and important matters, proposes that readers express their views as to the following: Resolved, that the actuarial profession will survive as a vital and meaningful force in today's complex society (and actuaries will be viewed as true professionals) only if it can find a means by which academic actuaries can become major contributors to both actuarial education and actuarial research.

C.L.T.

New Disability Valuation Tables

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either the 1958 CSO or the 1980 CSO (sex distinct) mortality tables and an optional rate of interest. Full information, and possibly the software, should be available at the San Francisco meeting.

The Society's schedule is as follows:

April 30: End of Exposure Period

May 22: Board receives a report from the Committee on the reaction to the Exposure draft and officially releases the Exposure Draft to the NAIC.

Sept. 27: Committee mails final Report to Board members.

Oct. 13: Board votes on final Report and, if approved, officially releases Report to NAIC.

The NAIC (E5) Life, Health and Accident Actuarial Task Force, which prompted the formation of the Society's Committee, is currently reviewing the Exposure Draft and will also review the added comments. Chairman of the Task Force is John O. Montgomery (California Insurance Department).

The Task Force timetable is:

June: Propose that the NAIC initiate an industry exposure period for a resolution to adopt a new basis for individual disability income policy reserves and for both individual and group LTD claim reserves. Tentatively, they are considering that this new minimum basis would be optional for policies issued and claims incurred in 1986, and would be mandatory thereafter. The Task Force will base its decision on its review of the Exposure Draft released by the Board on May 22.

October: The NAIC Task Force will meet in conjunction with the Society of Actuaries Meeting in New Orleans to draft a proposal for a new valuation basis to be recommended to the NAIC.

December: The NAIC will take formal action on the (E5) Task Force recommendation.

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Interest Sensitivity — A Continuation

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where $\sigma^2(i)$ represents the variance of the same distribution for which d(i) is the mean.

This is indeed an interesting relationship. We see at once that the duration decreases as the interest rate rises (σ^2 must be >0), and that the change is measured by $v\sigma^2$. For a wide-spread series of C_t, $d_{(i)}$ will be highly sensitive to changes in i, but a compact series will be less so. Should there be only one non-zero C_t, i.e. payments all concentrated at a single point of time, $\sigma^2 = 0$, and duration is independent of i.

Limiting Values of d(i).

We have seen that d(i) decreases as the interest rate increases. This of course means that if d is originally positive, it becomes less so; and that if d is first negative it becomes more so. What is the limit of d(i) as i becomes infinite?

Dividing numerator and denominator by v^k where k is the smallest value of t for which a non-zero C_t exists shows that the limit in question is k. Thus the earliest payment is controlling for extreme values of i.

Illustration

We conclude with an example that illustrates many of the relationships here considered. We assume a payment of 1 a year ago, and a payment of 2 five years hence. The C_t series becomes $C_1 = 1$, $C_5 = 2$, and all other $C_t = 0$. $f(i) = (1+i) + 2v^5$, and $d(i) = \frac{-(1+i) + 10\,v^5}{(1+i) + 2\,v^5}$. The following table shows values of f(i), d(i), and σ^2 (i) for a selection of interest rates.

i	f(i)	d(i)	σ^2(i)
0	3	3	8
.03	2.7552176	2.7569829	8.426977
.06	2.5545164	2.5102919	8.7396026
.060001	2.5545103	2.5102837	8.7396107
.09	2.3898628	2.2634412	8.9305989
.12	2.2548537	2.0197623	8.9996093
.4678	1.7613591	0	5.0
1.0	2.0625	−0.8181818	1.0578505
10.0	11.000006	−0.9999938	.0000395
∞	∞	−1	0

Notes:

(a) i = .060001 included to permit check by indirect calculation.

(b) f(i) decreases up to point where d(i) crosses zero, then increases.

(c) d(i) decreases, becoming asymptotic to −1.

(d) σ^2 (i) increases, then decreases. Although not previously discussed, the derivative of σ^2 (i) is $-v$ times the third moment. At i = 0 the third moment is −16 and the derivative of σ^2(i) is positive. Somewhere above 12% the third moment turns positive. In the limit all the weight is at −1, and the variance approaches zero. □

Disability Valuation Tables

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The timetable is very short! The Committee needs your responses quickly in order to address them in the May 22 Report. We hope to be able to address subsequent responses received prior to July 31. Any major concerns you may have should either be exposed at PD46 in San Francisco, or addressed to the Committee Co-chairmen, William J. Taylor (Massachusetts Mutual) and Duane Kidwell (The Paul Revere Companies) with a copy to Mark Doherty, Director of Research (The Society Office). □

LETTERS

Study Material

Sir:

In light of the many recent syllabus changes, I feel that each exam should be published and included in the study material for the following exam period, along with suitable sample questions for any new material. *All* students would then have access to the prior exam, which access only *some* students now enjoy.

I have confidence in the exam committee's ability to design unique questions for each exam period. Since CPA and bar exams become common knowledge shortly after their administration, why not the exams of the actuarial profession?

Dean L. Taylor

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Sir:

In October Rick Edwards asked why students should be tested on material unavailable until a few months before the test. Another question is why students should be tested on material that has not been updated in four years, while the related laws and procedures have been modified in each of those years? (See Part 7P - EA1&2).

Cathy Drown

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Reserve Bases and Professional Standards

Sir:

The tax turbulence of 1983 and 1984 has given rise to some interesting tax strategies by various companies. Much has been done and not discussed openly. The 1983 audits by the IRS will be done in a couple of years. Then, there will be some interesting decisions.

In practice, many actuaries have discovered that many State Insurance Departments do not police the raising of reserves. Thus, in effect, there is no check on a company which chooses to raise reserves for some tax purpose unless the IRS strengthens its enforcement procedures.

By reading recommendations 7 and 9 of the American Academy of Actuaries,

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