Article From:

The Actuary

Ruin Probabilities

appear to perform reasonably without benefit of detailed probability models; they simply promulgate rules that appear to promote a desired result, i.e., orderly markets. Individuals and firms may base their own decisions on subjective probability estimates if they wish, but like action by government as a matter of public policy should be avoided if reasonable more direct methods of achieving the purpose are available.

James E. Jeffery expressed his views thus: It seems to me of little consequential difference to a life company whether it faces a stock market collapse or a catastrophic epidemic. In either case, acceptance of the risk of ruin is reasonable provided (1) prudent measures are taken to make the likelihood very small, (2) the risk takers are aware of the risk, and (3) they are reasonably compensated.

Although specific arrangements of maturity guarantees on equity products may be improper in terms of these tests, the making of such guarantees by life companies is not in itself improper.

Our thanks to these two contributors for their thought-provoking expressions.

E.J.M.

INDEXED-LINKED SECURITIES IN THE U.K.

by Alistair Neill

Should prices of index-linked securities move with interest rates, with common stock prices, a combination of these, or neither? Perhaps there will be a contra-movement compared with fixed interest securities; if interest rates come down, this will probably be at a time of lower inflation—the attractions of the index-link as an inflation hedge would then be reduced—and thus the price will fall.

For much of the time since my last report (May 1982 issue), the expectation of lower inflation seems to have been pulling the price down, i.e., increasing the yield. The 2½% yield which was mentioned increased to about 3%, and there had been relatively little change in the position despite a considerable fall in interest rates in the last few months to about the 10% level and a decline in our price index into single figures. But

suddenly, last October, interest in the index-linked stocks revived; prices rose so that they yielded less than 2½%, where they have since hovered.

Why this quick change occurred isn't clear. It maybe because government securities and common stock have both had significant increases, the index-linked securities being pulled along as an investors' afterthought; or perhaps investors don't believe that single-digit inflation will be with us for long, so let's buy the index-linked securities before everybody else does; or, it may be something else entirely. □

Death

Ruth Helen Peck, A.S.A. 1979

TAX SITUATIONS UNDER TEFRA

by James P. A. Knight

Passage of the Tax Equity and Fiscal Responsibility Act of 1982 (TEFRA) has further complicated the analysis of a life insurance company's tax situation. In conveying the conceptual impact of the tax law changes to company people already familiar with the principles of the 1959 Act, it is useful to develop a new classification system, based on the amount of Special Deductions allowed under Section 809(f) of the Tax Code.

For brevity, use the following notation:

$$T = \text{Taxable Investment Income}$$
$$G' = \text{Gain From Operations Before Special Deductions}$$
$$Q = \text{Qualified Pension Plan Policyholder Dividends}$$
$$P = \text{Policyholder Dividends on Non-Qualified Plans}$$
$$N = \text{Non-Participating Contract Deductions}$$
$$H = \text{Group Life and A\&H Deductions}$$
$$S = Q + P + N + H = \text{Maximum Special Deductions}$$
$$S^* = \text{Allowable Special Deductions Under Section 809(f)}$$
$$G = G' - S^* = \text{Taxable Gain From Operations}$$
$$I = \text{Taxable Income}$$

First, note that the calculation of life company taxable income remains unchanged by TEFRA and can be written as:

$$I = \text{the smaller of T or G, plus } [½(G - T), \text{ if positive}]$$

However, TEFRA affects the calculation of both T and G. Because all companies are taxed in whole (if $G < T$), or in part (if $G > T$), on Gain From Operations, this note focuses on $G = G' - S^*$.

Before TEFRA, the effect of Section 809(f) was to set $G = T - \$250,000$ for many companies. This led directly to the classification system of identifying a company's tax position: a Phase I or Situation B tax was on $G = T - \$250,000$; a Phase II— or Situation A tax was on $G < T - \$250,000$; a Phase II+ or Situation D tax was on $G > T$.

Section 809(f) places a limit on certain Special Deductions (S) used to calculate the Gain From Operations (G). Shown below are pre-TEFRA and current formulations of the allowable Special Deductions (S^*) under Section 809(f).

GOLDEN ANNIVERSARIES

Congratulations to 12 Fellows and 2 Associates who qualified for those categories in 1933:

Fellows

J. Finlay Allen	Leland J. Kalmbach
John C. Archibald	Harold R. Lawson
Lachlan Campbell	A. Earl Loadman
Thomas E. Gill	Leonard H. McVity
Russell O. Hooker	Frederick P. Sloat
James Hunter	Andrew C. Webster

Associates

Gerald M. Grassby   Leona Kuntz

The 1983 cohort of 50-year Fellows has proved itself a relatively hardy group, in that 63% of its 19 originals

PRE-TEFRA

$S^* =$ the smaller of:

    (a) S, or

    (b) $[(G' - T)$, if positive,$] + L$.

TEFRA

$S^* =$ the smaller of:

    (a) S, or

    (b) the larger of

        (1) $[(G' - T)$, if positive,$] + L$, or

        (2) $Q +$ the smaller of (i) $(1+f) * (P+N)$, or

                         (ii) $L + f * (P+N)$.

where L is \$250,000 pre-TEFRA and is now defined as \$1 Million, reduced for $S > \$4$ Million (to 0 when $S = \$8$ Million), allocated proportionately to the number of companies in the affiliated group. And where $f = .85$ for stock companies and $f = .775$ for mutual companies.

Thus, a company's tax position can be classified in terms of the amount of Special Deductions allowed under Section 809(f). Assuming increasing levels of S^*, the classes for stock companies would be:

Category V	:	$S^* = L$
Category W $L > (P+N)$	:	$S^* = Q + 1.85 (P + N)$
Category X $L < (P+N)$	:	$S^* = Q + L + .85 (P + N)$
Category Y	:	$S^* = G' - T + L$
Category Z	:	$S^* = S$

The variable L introduces a factor into the tax calculation that may come from data not included in the company's tax return. Also, a new corridor situation develops when an affiliated group's total special deductions fall in the range from \$4 Million to \$8 Million. Interesting marginal tax rates develop within this corridor.

Comments are being made indicating a switch of the tax phase for most mutual companies from Phase I to Phase II−. While being basically true, the statement is not fully accurate in that only a few companies will find themselves in the old Phase II-position. It might better be said that the old Phase II-companies, which previously had a \$250,000 limit on Special Deductions, will join the old Phase I companies in a new category, both having a variable amount of allowable Special Deductions. □

The Northampton Table

It is right for us today to remember and to acclaim Richard Price's work. James S. Elston, in the second edition of *Sources And Characteristics of the Principal Mortality Tables* (1932) gives this endorsement by an 1823 author:

> "Dr. Price did as much as the nature of his materials would allow. For in those days no census or enumeration of the population had been made; and without (that) . . . an accurate Table of Observations cannot possibly be obtained."

My thanks to Howard W. Johnson, F.I.A. of London's Equitable Society for sending helpful material used in this account.

Wigglesworth's Table (1789)

"The first American table used at all for calculating life contingencies"—these words are quoted from *TASA* VII (1901), 3—made up from records in healthy portions of Massachusetts, was published, by Prof. Edward Wigglesworth of Harvard University, only six years later than was the Nortohampton Table.

E.J.M.

Golden Anniversary

remain. They became Fellows in the year in which the total number of Fellows went past the 400-mark; happily, 90 of those 400 are still with us.

The number of Associates who have 50 or more years as such is now 33.

The Society member who has been one for the longest time is Horace Holmes (F.S.A. 1921); he earned his Associateship in 1913 and is our only living member whose name is in the first published Index to the *Transactions* (1889-1914). Erston Marshall, though, is still our dean among Fellows, dating from 1919. □

THE PROPOSED NOTATION OF ENGELFRIET AND KOOL

by Frank G. Reynolds

(This is Article No. 6 in a series.)

Engelfriet and Kool explored the possibilities of using a linear form involving only the keys found on the standard typewriter keyboard. To replace the superscripts and lower left corner resort was made to an ingenious series of combinations of the special characters. For example, the double quotation symbol replaced the dieresis; $\approx$ was used to indicate that annuity payments were deferred for a given period and then continued, and this for a limited period from the end of the deferment period; the apostrophe was used to indicate that the annuity was payable in advance. Thus, $n|m$ $\ddot{a}_x^{(h)}$ became ' "a $\approx$ (x,n,m,h).

For a compound status an additional letter was added to the stem to indicate last survivor and other conditions. In general, the proposal met its design criterion of being linear, of being readily transformable into programming names, and of using only typewriter characters. The problem was the extensive use of backspacing to create characters such as $\approx$ and the use of auxiliary symbols which made it difficult to relate symbols to the present notation. □