SOCIETY OF ACTUARIES

Article from:

The Actuary

January 1981 – Volume 15, No. 1

The Actuary

The Newsletter of the Society of Actuaries

VOLUME 15, No. 1 JANUARY, 1981

1979 AGENT TERMINATION TABLES

by Joseph R. Brzezinski

LIMRA has just conducted an informal study of agent terminations, collecting information (for all causes combined) (a) by both contract and calendar years for full-time career agents hired during the past 15 years, and (b) by calendar years in attained age groupings for agents hired more than 15 years ago. The 74 contributing companies were sent summary results during 1980.

Since then, effort has been devoted to smoothing the observed results and creating agent service tables by contract year. This smoothing was done graphically. The early termination rates are accurately reproduced, but rates for later contract years had to be smoothed more heavily, primarily to remove apparently aberrant heaping of terminations in the 11th to 14th years attributed to industry compensation and management practices.

Distributions of agents by age at hire were supplemented by the following assumptions:

- 1965-1970 Basic Ultimate Mortality
- 6-month Disability, 1971 Modification to 1964 Commissioners Disability Table
- Various assumptions about agent retirement.

Five multiple-decrement service tables, being called the *Brzezinski* 1979 *Agent Termination Tables* were produced. One of these was for agents of multiple-line companies, one for combination companies, the other three show the experience of companies not in those special categories, divided into three performance segments. Each of these segments reflects the experience of, as closely as possible, the same number of entrant agents.

Information useful to actuaries for creating their own tables for valuing

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IN PRAISE OF COMMUTATION FUNCTIONS

Let me be your servant:
Though I look old, yet I am strong and lusty.
As You Like It, II, iii

Ed. Note: In FIASCO, our London sister-journal, we read that Mr. Gary Chamberlin, an Institute member, had written a paper, The Proficient Instrument, *showing "how the Pension Funds actuary can add a new dimension to his choice of actuarial bases." Mr. Chamberlin kindly sent us a copy of his paper, which was first presented to the Institute of Actuaries Students' Society on November 18th, 1980. We undertake no more than to introduce its theme here, and will gladly send the text to the first reader who expresses enthusiasm for reviewing it more thoroughly.*

The paper's full title is: THE PROFICIENT INSTRUMENT: A New Appraisal of the Commutation Function in the Context of Pension Fund Work. The commutation function, says its author, is part of the actuary's basic equipment, guiding and assisting him in many of his calculations. As a whole, these functions form a powerful algebraic system for producing approximations to integrals. The computer has led many actuaries to disclaim the commutation functions which have served them so long and so well. But both the commutation function and the computer are mathematical instruments and can be made to work together well, performing their separate and complementary functions.

The author's way of highlighting the commutation function's continuing usefulness is to focus attention on the "N-Year Discontinuance Valuation." Says he,

> "In such a valuation, by contrast to the more usual Aggregate method, it is assumed that the fund will be voluntarily wound up after the passage of the given period of

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PROPOSAL FOR A NEW CONSUMER INDEX

by Barnet N. Berin and Lloyd S. Kaye

Ed. Note: These are excerpts from a complete article in THE MERCER BULLETIN, Nov. 1980. *You may request the full text from Mr. Berin at his* Year Book *address.*

We're Doing It Wrongly

We "overmeasure." Changes in the Consumer Price Index and other economic indicators influence business and investment policies and have a psychological effect on the marketplace as well as on consumer confidence. These statistics are converted into equivalent annual rates of return, assuming 12 successive months of the *same* experience and interpretative articles are written. Such commentary leads to news conferences, further interpretation, and the introduction of counter statistics indicating that the unfavorable trend may have been reversed. Quietly, months later, the statistics may be revised to correct an error (or) an abberration that, if known earlier, would have led to different conclusions.

(And) we measure the wrong statistics as a rate of inflation and stubbornly persist in doing so. The CPI concept of tracking a defined list of goods (with housing handled in an unusual fashion) made sense during World War I when checkbooks were less prevalent and credit cards non-existent.

What We Should Start Doing

To de-emphasize this concentration on a single month, we should introduce 12-month moving averages, (making) the latest month's experience a beacon only if supported by the trend of several preceding months.

Now it is possible, indeed necessary, to develop an exact CPI for an individual or a group. With a carefully chosen

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Commutation Functions

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years. . . . By having at his finger tips N-year as well as aggregate-type functions, the actuary will add a further dimension to his possible choice of valuation basis. The dimension may be thought of as his 'horizon' on those future events which affect the payment of benefit. . . ."

The approach itself is described thus:

"In forwarding the aim, the paper uses a novel method for the analysis of commutation functions, and the construction of new ones. There are several elements to this, for example the use of special abbreviated formulae to bring out underlying mathematical structure, and the introduction of two new notational forms relating to difference and ratio. But the most striking feature is the formal diagrams which are brought in to show the nature of the M and R functions, and which are of great assistance in the derivation of many of the N-year formulae. Also, there is the step of taking normal retirement benefits as a separate category, which has not apparently been developed in previous treatments of the subject. . . .

"These devolopments in notation and exposition are intended in large part as a way of loosening the hold of the commutation function theory in its current state. By adopting a new approach, one may come to see that a great deal more is possible with the functions than may have been supposed. Also, one may see that in order to make progress in actuarial mathematics, it is not necessary to discard all that has gone before, nor indeed desirable."

The computer's role in all this is described thus:

"(The) computer must be given a method by which it is to produce the results. Hence it may come to be, more frequently than imagined, that the commutation functions will in a sense reappear within the machine itself as the written program takes effect.

"The point is that the mathematical series have still to be summed—and the method of greatest power and adaptability may very well be to combine the subtle algebra of the commutation function with the virtuosity of calculation inherent in the computer. But even in this, one should be aware that the algebra must be given first place, since it is the instrument of control; while the computer will follow in obedience where the algebra leads. *At all costs, the danger is to be avoided whereby the actuary may come to depend on a convenient software package to such a degree that he effectively hands over his conception of and execution of the calculations to a computer programmer or systems analyst.*" (emphasis added).

The author develops his ideas through seven descriptive chapters and then a summing-up. Even a casual reader will, we think, notice that Mr. Chamberlin has found personal delight in his vision of what commutation functions can do when used imaginatively to reval the finer points of pension fund analysis and to bring the actuary closer to being monarch of what he performs. In answer to our question about the applicability of his approach to pension fund analysis on this side of the Atlantic, the author said, "I believe that 'The Proficient Instrument' would be of interest to actuaries in Canada and the United States, particularly in view of the wide variety of funding methods which are in use."□

Consumer Index

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national sample, individuals in the study would agree to use either a check or a credit card for all purchases in excess of $10. Cancelled checks and credit card slips would furnish verification of expenditures which then would be slotted into categories such as food, clothing, utilities, etc. For either an individual or a group, these monthly totals would produce an exact consumer index. Month-to-month ratios would reveal percentage changes in amount actually spent on basic items and, in aggregate, changes in monthly living costs. In a stable economy, these ratios would be fairly constant.

By utilizing sampling techniques, a regular analysis of actual costs (with cancelled checks and credit card receipts as indications of expenditures) could be extended to a region or the nation. Groups excluded can be assumed to follow a similar purchasing pattern, but this should be checked periodically.

The Point of This Two-Part Plan

In addition to a smoothing device, what is needed is a sampling technique which will result in a vital index of living *costs*, rather than a measure of *price* increases. We need to develop an approach which will reveal, on a 12-month moving average, how people and families have been spending their money.

Common sense and personal experience indicate that as prices of certain goods and services rise dramatically, shifts in expenditures occur almost automatically. Less steak, more chicken; less expensive vacations, etc. The CPI attempts to recognize these shifts by changing its components. However, CPI market basket changes occur slowly; the current selection of goods and services (compiled in 1977 and effective in January 1978) is based on consumer surveys conducted in 1972-73. Today's market basket reflects out-of-date buying patterns. The compilation of the CPI also ignores the availability of discounted merchandise; price data are collected at regular store outlets. What should be measured are consumers' real expenditures.

Critics of an approach which monitors costs might argue that what is happening is a reduction in living standards; a family that, for example, changes its eating patterns is not living as well as previously. The difference focuses properly on the problem. By measuring actual living cost expenditures, and noting shifts in emphasis attuned to changes in the economy, we get a better indication of how serious an issue inflation is for any individual or family.

By approaching the issue from the perspective of expenditure rather than price, we measure living costs realistically. This is particularly necessary when one considers the effect of living cost fluctuation on Social Security payments, on collectively bargained COLA clauses and on plan sponsors under pressure to index pensions.

This difference in process is vital if we are to take corrective action and avoid conflicts between age and economic groups. A retiree index (for example)

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Consumer Index

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should reflect an altogether different pattern of home purchases, transportation costs, tax payments, etc.

Implications in Forecasting

Many otherwise thoughtful studies routinely project rates of inflation into the future without considering the ramifications. Many governmental agencies and private institutions project inflation rates in excess of 10% for periods of 20 or 30 years or more. But what does this mean? Can our society remain as it is today if we have double-digit inflation far into the future? If salaries and expenses and the price of bread and clothing move at this rate, what about other costs? What about the financially weak industries? What about the cost of doing business? What about lending institutions? What about the role of government? A far better projection technique is to identify a plausible *range* of possibilities, and project not one answer, but a range of possible answers. This will, of course, require some interpretation but that would be a salutory consequence of the exercise.

Let's Get To It

We have fallen into a habit of measurement that should be discussed, debated and corrected. We measure badly and yet draw conclusions from these measurements that affect everyone. The degree of economic change experienced recently, and likely to continue for some time, warrants a new look at how we measure and how the results are interpreted and used. The Bureau of Labor Statistics should be given the resources necessary to develop a new consumer index based on what people actually spend and not on a "typical" market basket of goods and services. □

Council of Professional Associations on Federal Statistics

We announce with pleasure that our own Robert J. Johansen has accepted the post of Secretary of the Executive Committee of COPAFS. The Council represents 12 professional associations, including the Society of Actuaries. It was organized to help increase the associations' involvement and that of their members in federal statistical affairs.

THIS MONTH'S QUERY FOR ACTUARIES

This is the first, in a probably irregular series, of questions that we'll put to our readers. All that we seek are brief, by no means comprehensive, responses. These will be assembled into an article, giving credit to those whose contributions have been used.

Query: *The Harvard Medical School Health Letter* has come out with a piece of advice to its readers entitled, WHO SHOULD I HAVE FOR MY DOCTOR?. Its test categories are: Background, Keeping Up, Reputation, Accessibility, Practice Patterns Relationship To You, Demeanor — closing with thoughts on parting company from a physician who is judged not to have met minimum standards.

Please send us, to our masthead address, an idea (or two or three) that you consider suitable for inclusion in an advisory essay to members of the public on WHOM SHOULD I HAVE FOR MY ACTUARY?

1979 Agent Termination Tables

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non-vested benefits is available by writing to the author at LIMRA, Box 208, Hartford, CT 06141.

The table herewith summarizes our new tables and compares them with the *McConney-Guest Modified*, (*TASA* XLIII, 307), and *Equitable* 1949-1960, (*TSA* XV, 458), tables. Although giving a general picture of the range and patterns of agent termination experience in the industry today, our values should not be interpreted as "industry averages," and cannot be applied safely to any single company without adequate consideration of that company's own experience.

Comparison of Agent Termination Rates

Contract Year	McConney-Guest Mod.	Equitable 1949-60	Brzezinski 1979 Tables				
			Ord. Cos., not Mult.—Line			Multiple Line Cos.	Combination Cos.
			Best	Middle	Worst		
1	.430	.476	.450	.635	.700	.240	.600
2	.370	.376	.400	.442	.565	.170	.490
3	.285	.296	.300	.315	.385	.105	.360
4	.225	.237	.210	.242	.310	.060	.280
5	.185	.187	.150	.190	.250	.040	.225
6	.152	.147	.130	.155	.200	.037	.185
7	.130	.117	.110	.125	.175	.032	.150
8	.115	.097	.095	.116	.150	.027	.125
9	.100	.088	.087	.108	.130	.023	.100
10	.086	.078	.079	.100	.125	.020	.094
15	.032	.045	.050	.070	.100	.009	.070
20	.025	.023	.042	.042	.079	.015	.042
25	.025*	.011*	.045	.045	.081	.023	.045
30	.037*	.016*	.051	.051	.110	.032	.051
40	.085*	.039*	.113	.113	.313	.092	.113
50	.183*	.101*	.220	.220	.442	.218	.220

* Deaths only.