CANADA PENSION PLAN SUBSIDIES

By T. H. Dancy

The following table demonstrates the built-in subsidy to a male individual contributor to the Canada Pension Plan. Disability and survivor benefits have been excluded although it has been assumed that the contributor will survive to age 65 and contribute in all years. Earnings are based on the Years Maximum Pension Earnings level each year which is based on the average industrial wage. Under the Canada Pension Plan the greatest subsidy exists for those at or above the Y.M.P.E., and the amendments at January 1, 1974 increased that subsidy.

The Y.M.P.E. is currently being increased rapidly to account for previous wage increases and, the illustration has been based on a Y.M.P.E. of $13,000 for 1981 as a starting point for a single male then aged 25 years. The calculations use two sets assumptions included in the Actuarial Report for the Canada Pension Plan as at December 31, 1973.

Assumptions

	Reasonable Stability	Moderate Inflation
Salary scale	3½%	5½%
Interest rate	4½%	6½%
Cost of Living Index	1%	3%
Post-retirement interest rate net of inflation	3½%	3½%

Mortality: G.A. 51 projection C to retirement (70 years from 1951)

Benefits: Unguaranteed life annuity (no other benefits)

Table

	Reasonable Stability	Moderate Inflation
Accumulated Contributions (1981 to retirement)	$81,748	$175,046
CPP Pensions at age 65	12,433 p.a.	26,255 p.a.
Pension from accumulated contributions only	6,270 p.a.	13,426 p.a.
Pension provided by subsidy	6,136 p.a.	12,799 p.a.
Present value of subsidy at retirement	80,349	166,865
at entry	13,812	13,439
Value of the subsidy at retirement in 1974 dollars	50,336	41,593

Clearly, these figures indicate the need for an increase in the contribution rates from the present 1.8% of salary up to the Y.M.P.E. by both the employer and employee. No such scheduled increase has been announced by the Government. The Statutory Actuarial Report #3 as at December 31, 1973 indicates that current contributions will cease to cover benefits and expenses by 1982 and that the fund will start to decrease in 1990 until exhausted by the year 2000.

CIVIL SERVICE RETIREMENT SYSTEM

by Thomas P. Bleakney, and Richard R. Joss

Both the title and the dull format in the usual Government Printing Office style would seem to insure this document's instantaneous consignment to dead storage. However, behind the cover of this small pamphlet is a concise, well-written report discussing a number of the issues facing not only federal pension programs at the present time, but all pensions in an inflationary economy. For example, several of the 11 pages devoted to the main report discuss the implications of "static" assumptions (ignoring inflation) as opposed to "dynamic" assumptions (including inflation).

The report is a valuation of the Civil Service System as of June 30, 1972. In addition to presenting conventional cost figures consistent with previous reports, it also expands substantially upon this in several ways:

(1) In spite of the fact that the 1972 normal cost rate (13.64%) turned out to be less than the agency-employee contribution rate (14%), the Board of Actuaries recommended no reduction in the last, due to the uncertainties surrounding the other matters discussed in the report.

(2) The Board pointed out that under the static assumptions, future inflation was not considered on the liability side of the ledger (in the form of an inflationary salary scale). On the other hand, the current inflationary trend

EDITORIAL

WE are always pleased to hear from our correspondents on matters great and
small. Recently there came a letter from a member of the Society inviting us
to save energy and space by omitting the dots between the letters of abbrevia-
tion, e.g., FSA not F.S.A. This deserves careful consideration even though we are
reminded of the patient in the ophthalmologist's office who explained to the doctor
that he could read the eye chart but could not pronounce the words.

The 1976 Year Book has just arrived and we have been studying it with care
particularly the examinations that we, fortunately, do not have to pass. We continue
to be amazed at the scope of the examinations and we encourage the efforts of the
E and E Committee to produce actuaries who are both practical and theoretical.

Sometimes we wonder whether the Syllabus might not lean more towards the
practical side. A recent letter from another member of the Society drew our attention
to an item in *The Smithsonian* which stated that "South American actuaries have
estimated that a single anteater will eat 30,000 fire ants in one day." Our corres-
pondent concludes that the South American Syllabus must have a zoological content
which is lacking in the Society Examination Syllabus. (E & E Committee please note.)

There are other ways of helping the budding actuary to be more practical as,
for example, the following question that appeared in the examinations of another
actuarial body:

Members of an actuarial group, intrigued by suggested antidotes to the consequences of
drinking, investigated four of these antidotes:

(a) 2 lb. of mashed potatoes:		(c) 1 pint of water;	
(b) 1 pint of milk;		(d) 1 raw onion.	

Twenty volunteers were used, five on each antidote, the allocation to antidote being random.
One hour after each had drunk the same quantity of alcohol and swallowed the appropriate anti-
dote, a blood test was carried out. The resulting levels (mg./dl.) of alcohol in the blood were
as follows:

(a)	(b)	(c)	(d)
76	110	95	87
52	96	145	93
92	74	100	91
80	105	100	120
70	125	190	99

Construct an analysis of variance table and test whether or not the four antidotes have the
same effect.

The student who could correctly answer such a question would feel very much
better able to cope with the receptions which are such an important feature of
Society meetings and this practical type of question could well encourage students
to enter the profession. At least the subject of the question would be understood
by the layman, much more easily than, we suggest, would some of the terms now
proposed for pension plan terminology.   *A.C.W.*

CHICAGO CORNER

What Goes On in Chicago?

In January, I described the new Society
headquarters and invited members to
drop in and see what it looks like. A
natural question is, what goes on there?

The Society headquarters staff con-
sists of 16 people, including Bern Bar-
tels, the Society's Administrative Officer
and myself. Bern is in charge of the di-
rect supervision of the staff, and does
an excellent job of keeping the office
functioning smoothly.

An important part of the work of the
office staff consists of maintaining mem-
bership lists, reporting dues payments
etc., and generally taking care of all
membership matters.

A most important part of the work
involves the Education and Examination
system. Approximately 10,000 persons
sit for actuarial examinations every six
months. Each individual must receive
study notes (except for Parts 1-3) and
tickets of admission to examination
have their examination fees record
and eventually receive the good or bad
news. Most of this is normally routine
but occasionally emergencies arise,
such as occurred in the fall of 1975 with
the Canadian mail strike. Then it was
necessary to make special arrangements
to deliver examination materials to the
Canadian exam centers, inform the stu-
dents where to report, and, since one of
the Part Chairmen was a Canadian,
make special provision for processing
examination papers after the exam was
given. There was a lot of frantic phone
calling involved, but the Canadians end-
ed up taking their exams on schedule,
and that was what really mattered.

The sale of publications of the Society
is a surprisingly important part of the
work of the office staff. About $100,000
worth of books and other Society publi-
cations, excluding Study Notes and ma-
terial sent to members as part of their
membership dues, are purchased each
year. In each case, the appropriate pub-
lication must be taken from one of the
Society's storerooms (we have s
throughout the building), and mail
with an appropriate bill.

Many of you will never have the op-
portunity to meet many of the head-
quarters staff, but members attending

LETTERS

Independence of the Actuary

Editor's Note: We are glad to extend the courtesy of our columns to the Joint Committee on the Independence of The Actuary for publication of the following letter on one of the controversial aspects of independence. This letter reflects the opinion of the Committee and is not the official position of any of the actuarial bodies with which the Committee members are affiliated. The independence of the actuary is on the program for discussion at the Houston and Chicago meetings.

Sir:

A great deal of misunderstanding has developed as a result of some of the conclusions of the Joint Committee on Independence of the Actuary (see the November 15, 1975 Exposure Draft in response to which observations and comments were solicited through January 31, 1976). We have been advised that many actuaries working for accounting firms believe that the Committee's motive in connection with its development of prohibited practices is to remove the economic competition which has sprung up as the result of the growth of accounting/actuarial firms. It is easy to understand how this misconception might have arisen. Consequently, the Joint Committee on Independence of the Actuary is most anxious to point out that this belief is erroneous.

The Committee's sole objective has been to develop strictures which would elevate the professional work of the actuary. The Committee feels that "independence" is a relative word, not easily defined, and that under most circumstances, professionalism and disclosure are more important than independence, particularly when familiarity with the subject matter is vital (e.g., the preparation of the annual statement of an insurance company).

Nevertheless the Committee feels that when an *audit* is involved, an actuary should not audit the work of another actuary with whom he has some sort of relationship which could compromise his objectivity, in appearance if not in fact. [Incidentally, it is understood that the accounting profession is somewhat disturbed over our use of the word "audit." We use the word in the general

sense to reflect a formal review for which the reviewer assumes responsibility. We are not attempting to change or impinge on whatever specialized meaning the accounting profession sees fit to attach to the word.]

The Joint Committee feels that audits are serious business, that the public is relying on the results of an audit and that it should be conducted on a very high plane.

Accordingly, the Committee concluded that an actuary should not directly or indirectly be involved in a so-called "self-audit."

This has nothing to do with whether an actuary should be employed by an accounting firm. It simply means that when an actuary and an accountant are employed by the same firm, the actuary should not do work which will be audited by that accountant. Otherwise, independence is compromised.

It is of interest to note that this question erupted into quite a controversy in the Philippines approximately six years ago. The conclusion reached by the Bureau of Internal Revenue was that "a person cannot be both an independent accountant and actuary of the same client." In reply to a request for reconsideration of this ruling, Mr. Vera, Commissioner of Internal Revenue, wrote in a letter dated Aug. 11, 1970:

> . . . The word "independent" means "free from the influence, control or determination of another or others; free from influence, persuasion or bias" (Webster's Dictionary, College Ed.). It is in this sense that the word "independent" is used in Revenue Regulations No. 1-68. To be really independent, therefore, a consulting actuary must, in the exercise of his profession, be free from influence, control, persuasion or bias.
>
> The mere fact of employment may bring about the loss of such freedom, although not always. An employee-actuary may qualify as an independent consulting actuary, but his privilege to exercise his profession independent of his employment is of course a matter that purely concerns himself and his employer. Thus, duly accredited actuaries employed in insurance companies, banks or in any other entity may prepare the actuarial report or statement of actuarial assumptions and certify the same in connection with the determination of the costing of retirement plans provided that he or his employer bears to the employer whose retirement plan is under consideration, no business or professional relationship which may in any way affect the free exercise of his professional actuations. But where an actuary is employed by a firm of certified public accountants which is the external auditor of the employer whose retirement plan is also being prepared or formulated by said firm, the actuarial re-

> port or statement of actuarial assumptions to be prepared by the actuary would in effect be prepared by him for his firm as an employee discharging functions requiring the application of his knowledge and not in his individual capacity as a professional. In such situation, there can be no doubt that the actuary may not be free from influence or bias or persuasion as the relationship of his employer to the client are factors that affect his freedom as an actuary. However, an actuary of an accounting firm may prepare the actuarial report as regards the costing of pension plans of employers of which the firm is not the external auditor.
>
> Financial interest and management participation are not all inclusive criteria that affect the freedom to exercise and apply one's profession. In fact, even the Accountancy Law and the rules of the Board of Accountancy admit this. As "independence" is generally conceded as a state of mind, it can be said that any and all factors that tend to affect such independence can and should be considered and taken into account in appreciating the independence of an actuary, such as employment.
>
> It is the essence of the law and the implementing regulations that the costing of retirement plans should be fixed and predetermined in accordance with sound actuarial assumptions. It is for this reason that the regulations require that the assumptions should be certified by an "independent consulting actuary." It is not for the employer to determine at will how much he should contribute depending on his profits; otherwise, the requirement on the submission of the actuary's certification of actuarial assumptions would be an empty gesture.
>
> As regards your contention that an actuary, like a lawyer, will be guided by the ethics of his profession, suffice it to say that ethics of professional practice should be disassociated from the appreciation of "independence." An accountant or actuary may act strictly within the ethics of his profession and yet may not be considered independent.
>
> In view of all the foregoing, this Office is not inclined to modify or revoke the ruling in question. Accordingly, your request for the reconsideration of the same has to be as it is hereby denied.
>
> Very truly yours,
> (SGD) MISAEL P. VERA
> Commissioner of
> Internal Revenue

In closing, it should be noted that the AICPA recognizes the delicacy of the relationship between two professionals operating within the same firm and serving the same client. A recent ethics ruling by the AICPA expressed its conclusion through the following question and answer.

Subject: *Member Providing Actuarial Services*

Q. If a member's firm renders actuarial services to a client, may the member also express an opinion on the client's financial statements?

Letters

A. Even though the member's firm provides actuarial services (the results of which are incorporated in the client's financial statements), if all of the significant matters of judgment involved are determined or approved by the client and the client is in a position to have an informed judgment on the results, the member's independence would not be impaired by such activities.

We think most actuaries would agree that it is an extremely rare occasion when "all of the significant matters of (actuarial) judgment involved are determined or approved by the client and the client is in a position to have an informed judgment on the (actuarial) results . . . "

Comments are invited and should be sent to the Chairman of the Committee, Edward H. Friend, International Club Building, Suite 500, 1800 K Street N.W., Washington, D. C. 20006.

Joint Committee on Independence of the Actuary

* * * *

"The Proper Study, etc."

Sir:

As a feminist and an actuary, I share Ms. Rosenblatt's concern (expressed in her letter in the February issue) regarding the need for changes in language to accompany changes in our society. However, I believe it is unfortunate when we try to avoid or change a word which, in reality, is not inherently sexist, instead of trying to enlighten those who wrongly infer from that word a sexist connotation.

Specifically, if one were to check the definition of "fellow" in *Webster's New Collegiate Dictionary*, for example, she/he would find that the only reference to sex occurs in the fourth and *obsolete* definition (which, for those who are interested, reads in part: "a worthless man or boy").

By continuing to assert that the word "fellow" should be applied only to men, one is assuming, in effect, that this title, which traditionally connotes high esteem, may not be associated with women. It is this assumption and not the word itself which is sexist. Accordingly,

only as more women become and proudly refer to themselves as Fellows of the Society of Actuaries, will the word "fellow" be freed from any possible sexist associations.

Sally B. Schreiber

* * * *

The Actuary in Literature

Sir:

The following extract from Georges Simenon's autobiography, *When I was Old*, may be new to most of your readers. Simenon is better known for his Inspector Maigret detective stories and probably after reading the extract actuaries will prefer these to Simenon's other novels. Had Maigret been employed to find out a little more about the actuary, the picture in *Le Fils* might have been a little more accurate.

"In *Le Fils* I took an actuary as a character. These are unquestionably the people who cast the coldest eye on human life, passions, etc., since they study man only from the point of view of insurance companies. So many chances for such an individual to live so many years, to have a fire, an automobile accident, a personal tragedy . . . calculated in figures . . .

"They don't, as for instance many doctors do, read a paper at the Academy of Medicine, write an article or a report for a journal, or present a daring hypothesis calculated to lend importance to the author.

"The actuary is a boring gentleman. He may occasionally be mistaken in a particular case. Not too often. Never in his general forecasts, where it is not a matter of science but of money, the sacred money of the companies.

"The world as seen by these people. No room for philosophy, for feelings, no place at all for the approximate, for the nuances of art. A sort of X-ray of the world, of society.

"All that has to be false. And yet close enough to the truth, since the estimates have to be more or less accurate.

"Good risk. Poor risk. Bad risk."

Eugene F. Dorfman

* * * *

Multiple Decrement Probabilities

Sir:

Mr. Lowrie in the October issue presents an alternative to Jordan's Formula (14.38) which is, as Dr. Seal points out, given in Hooker and Longley-Cook, vol. 2. An analysis of the underlying assumptions is given by Mr. Mereu. The relationships between assumptions and various formula appear in Hooker and Longley-Cook, vol. 2, where they are dealt with more thoroughly than in Jordan's book.

The purpose of this letter is to prove that Formula (14.38) together with the pro-rating is in fact equivalent to Lowrie's method and as such Jordan's method should be discarded in favour of Lowrie's.

Using Jordan's formula (14.38), it is easy to see that

$$q_x^{(1)} + q_x^{(2)} = \frac{q_x^{(T)}}{1 - \frac{1}{4} q_x'^{(1)} q_x'^{(2)}}.$$

Thus (14.38) overstate the probabilities

Let $q_x^{(k)^c}$ denote the corrected (by prorating) probabilities.

Then

$$q_x^{(1)^c} = \frac{q_x^{(1)}}{q_x^{(1)} + q_x^{(2)}} q_x^{(T)}$$

where $q_x^{(k)}$, $k = 1, 2$ are obtained from formula (14.38). By substitution of (14.38) into the above, one obtains

$$q_x^{(1)^c} = \frac{q_x'^{(1)} \left(1 - \frac{1}{2} q_x'^{(2)}\right)}{q_x'^{(1)} + q_x'^{(2)} - q_x'^{(1)} q_x'^{(2)}} q_x^{(T)}$$

$$= q_x'^{(1)} \left(1 - \frac{1}{2} q_x'^{(2)}\right),$$

since the denominator is identically

$$q_x^{(T)}.$$

Thus Jordan's two stage approximation method is equivalent to the simpler method of Lowrie.

Harry H. Panjer

* * * *

Sir:

I was puzzled by Hilary Seal's letter in the January issue, in which a comparison

is made between the following two approximations for $q_x^{(1)}$:

$$(14.38) \qquad q_x^{(1)} \doteq \frac{q_x'^{(1)}\left(1 - \tfrac{1}{2}q_x'^{(2)}\right)}{1 - \tfrac{1}{4}q_x'^{(1)}q_x'^{(2)}}$$

$$(I) \qquad q_x^{(1)} \doteq q_x'^{(1)}\left(1 - \tfrac{1}{2}q_x'^{(2)}\right)$$

Walter B. Lowrie presented (I) in the Oct. issue of *The Actuary* and (14.38) appears in the Life Contingencies text by C. W. Jordan.

Expanding (14.38) as Mr. Seal suggests yields:

$$q_x^{(1)} \doteq q_x'^{(1)} - \tfrac{1}{2}q_x'^{(1)}q_x'^{(2)} + \tfrac{1}{4}\left(q_x'^{(1)}\right)^2 q_x'^{(2)} + \cdots$$

Mr. Seal's statement that this implies "both formulas are correct only to the term involving a product of two decremental probabilities (rates)" is simply not true. As (I) is an approximation itself, and as it is not necessarily true that

$$q_x^{(1)} = q_x'^{(1)}\left(1 - \tfrac{1}{2}q_x'^{(2)}\right) + g$$

where g is of the order of a product of 3 decremental rates, one cannot assert that (14.38) is only correct to the term $\tfrac{1}{2}q_x'^{(1)}q_x'^{(2)}$. The above expansion can only imply that the two approximations differ by a quantity like g.

Although John A. Mereu (in the January issue) points out that (14.38) involves

a subtle error, Jordan's two step method for obtaining $d_x^{(k)}$ and hence $q_x^{(k)}$ yields the same results as (I): applying (14.38) to obtain first estimates of

$q_x^{(1)}$ and $q_x^{(2)}$ and then

$$(II) \qquad d_x^{(k)} = \frac{q_x^{(k)}}{q_x^{(1)} + q_x^{(2)}} \cdot d_x^{(T)}, \quad k = 1, 2,$$

eliminates the effect of the denominator in (14.38). In fact, recalling that Mr. Lowrie

showed that $q_x^{(T)} = q_x'^{(1)} + q_x'^{(2)} - q_x'^{(1)} \cdot q_x'^{(2)}$ we can derive (I) from (14.38).

Substituting values of $q_x^{(k)}$ in (II) from (14.38) and eliminating the

denominator $\Rightarrow$

$$d_x^{(1)} \doteq \frac{q_x'^{(1)}\left(1 - \tfrac{1}{2}q_x'^{(2)}\right)}{q_x'^{(1)} + q_x'^{(2)} - q_x'^{(1)} \cdot q_x'^{(2)}} \cdot d_x^{(T)} = \frac{q_x'^{(1)}\left(1 - \tfrac{1}{2}q_x'^{(2)}\right) \cdot d_x^{(T)}}{q_x^{(T)}}$$

$$= q_x'^{(1)}\left(1 - \tfrac{1}{2}q_x'^{(2)}\right) \cdot \ell_x^{(T)} \quad \Rightarrow \quad q_x^{(1)} \doteq q_x'^{(1)}\left(1 - \tfrac{1}{2}q_x'^{(2)}\right)$$

* * * *

James A. Geyer

Alternate Route

Sir:

I am neither a proponent nor opponent of the alternate route; however, as an on-campus recruiter of actuarial students for a large company for four years and now as a professor of actuarial science, I feel compelled to answer Mr. Kabele's scathing letter in the February issue concerning the alternate route.

Mr. Kabele undermined his arguments by making ridiculous and exaggerated statements such as "thousands — yes thousands — of Associates pouring out' and 'require college students . . . to pass additional examinations."

If we were to accept such statements as the last, we should require actuarial students employed by large insurance companies which give large amounts of study time, to pass more examinations with "tougher grading scales" than actuarial students employed by smaller companies and consulting firms which give little or no study time to their students. The point of an actuarial examination is education. The exam is just a means of insuring that a student has learned the material that is covered by the examination. A person's other activities have nothing to do with this process.

Although I feel that I could speak for other actuarial programs since I am quite familiar with most of them, I will speak only for our program in saying that, although it is true that grade inflation is a present phenomenon in most colleges and universities around the country, it has not affected the actuarial courses at the University of Nebraska-Lincoln. *No* student is asked what grade he/she expects; *no* student can sit back and wait for his/her "A". There is no avalanche of "A"s in our program.

It has been my experience both as a professor and a recruiter, that actuarial students hired from actuarial programs make much more knowledgeable and astute students than the average *math* major who passed two examinations without any commitment to the profession, just so he/she could get a job. Most college actuarial students are well founded in actuarial courses, mathematics courses and, perhaps more importantly, in business courses. If our profession lacks in any area, it is in the management area. We need more ex-

Letters

posure to the business world through the educational process. Most actuarial programs give this to their students. College actuarial students are persons who have dedicated themselves to the profession, taken a balanced program which has allowed them to gain much knowledge and understanding of the profession and are much more able to step into a company and begin to function as a contributing employee than a math major who just heard about the profession and couldn't get any other job.

The alternate route can be attacked on other points, but Mr. Kabele's attack seems mis-directed. The process of accreditation of actuarial programs would strengthen any program or eliminate it. Programs which are not qualified would not function in the alternate route comprehensive exam system. Small, ineffective programs would be discouraged. Thus it is doubtful that very many additional programs would be started.

Mr. Kabele speaks of the "regular examinations" but we should all be prepared to change, progress and be innovative. While I am not necessarily saying that the alternate route is a progressive step, we should not throw it out just because we came up in a different way.

Cecil D. Bykerk

* * * *

Asset Valuation and Fair Market Value

Sir:

Mr. Ramirez' article in the January issue is interesting. The problem discussed is, I think, somewhat broader than Mr. Ramirez assumes in his approach. It is the question of finding a satisfactory Adjusted Asset Valuation System which must consider book value and market value developments over the year. My own viewpoint on the problem is expressed below.

When market appreciation becomes substantial, attention is normally directed toward designing an asset valuation system greater than book value but less than market value. In most cases, the valuation of assets at market value would be risky, the value being too volatile.

With a spread-gain funding method, some of this risk is diminished. With ERISA's immediate-gain funding me-

thod requirement of 15-year amortization of actuarial gains and losses, this risk is diminished as well. (Recognized funding methods can be classified as either spread-gain or immediate-gain).

Unless there is ample market appreciation, sustained over a period of years, there is normally little interest in adopting a system other than book value. However, with ERISA requiring some recognition of market value, the actual number of special asset valuation systems in use is increasing and will be the dominant form for asset valuations in the future.

These systems must attack two basic problems:

(i) When the decision is reached to move to a system other than book value, the existing appreciation at the valuation date might be significant and some method must be devised to introduce this appreciation gradually into the valuation.

(ii) More important and more fundamental, some method must be devised to smooth or reduce investment fluctuations. These involve smoothing the fluctuations in emerging unrealized appreciation.

Consider the total investment increment of a fund based on book value and the total investment increment of a fund based on market value. These are indicated in parenthesis immediately below.

(Interest Income + Net Realized Gains)

(Interest Income + Net Realized Gains

+ Increase in Net Unrealized

Appreciation)

It is the terms in parenthesis which have to be smoothed or regulated so that we move successfully between book value and market value. It should be apparent that the problem lies with the lack of predictability of net realized gains and with fluctuations in Net Unrealized Appreciation.

It is possible to list the desirable properties of an Adjusted Asset valuation system.

(1) It should be simple to operate.

(2) It should be simple to explain.

(3) It should have a basis in theory and be related to book value and to market value. A development of assets should be possible, similar to those above for book value and market value over a one-year period. In this connec-

tion, the graph of book value, market value and adjusted assets should make sense. Developments of all three: book value, market value, adjusted book value should be required.

(4) It should be flexible. The existing appreciation at the date the system starts should be introduced in an appropriate manner, suitable to the valuation problems at hand.

(5) It should include a smoothing device of appropriate weight. Too much smoothing and the adjusted assets will be too close to book value. Too little smoothing and the adjusted assets will be too close to market value.

(6) The system should become fully operative within a reasonable period of years and not take many years before becoming effective.

(7) Any excess of adjusted assets above market value should be limited and clearly indicated so that participants, accountants, and financial analysts are not misled.

Barnet N. Berin

* * * *

Actuarial Science in Nebraska

Sir:

In Mr. Potts' review of the film *Super Actuary* in the January issue, reference is made to the Committee for the Chair of Actuarial Science at Nebraska. Your readers might be interested in information about this Committee.

The Chair of Actuarial Science was established in 1957, thanks to the joint efforts of the Nebraska Actuaries Club and the University of Nebraska. Originally the life and health insurance companies of Nebraska contributed sufficient funds to the University of Nebraska Foundation so that a qualified actuary could be hired to begin the actuarial science program. The companies further agreed to provide financial support for a three-year period with the thought that the University could continue the program after the initial three years without further subsidy from the insurance industry.

At the end of the first three years the University found itself unable to fully fund the program and consequently the Committee for the Chair of Actuarial Science continues to function and to solicit funds from the insurance industry.

Civil Service

surely had affected the assumed interest rate (5%), the key ingredient on the potential asset side.

(3) Going further than just making the above statement, and indeed going further than required by law, the Board presented tables demonstrating the effect on costs of two sets of inflation assumptions.

Students of the fine points of funding federal plans may wish to review Walter Shur's excellent paper of several years ago, "Financing the Federal Retirement Systems" (*TSA* XVI, p. 265). Mr. Shur pointed out that the "problem of federal retirement plan financing is inextricably woven into the fabric of over-all fiscal policy." Thus, as Mr. Shur elsewhere noted, higher federal taxes to fund federal systems would result in a transfer of debt (the funds' increased assets) from the public to the retirement funds. "If higher taxes will put the economy of the future in a better position to bear the burden of retirement payments, then higher taxes are desirable with or without a reserve method of financing and the point should be argued on economic grounds, not on actuarial grounds." Despite this argument, Mr. Shur recommended normal cost plus interest funding for the sound financing of the federal systems.

The report of the Board of Actuaries noted that such a recommendation was not their function, but that it was incumbent upon them "to point out that the present approach to funding this System will lead to spiraling costs in the future, not only in dollar amounts but as a percentage of covered payroll." Apparently, projections have been made to illustrate this point, but the report itself gives adequate proof to the actu-

arial reader. The accompanying table of employer costs, calculated in various manners, is indicative of the current level of underfunding of this system. All figures are employer contributions approximately as of the valuation date, June 30, 1972.

The static assumptions include a 5% interest rate and a total annual salary increment in the 2% to 2½% per year range. Of the two dynamic scales adopted, the one assuming the greater inflation (Dynamic II) used a 6% interest rate and a total annual salary growth rate in the 5% to 5½% range, plus the assumption that CPI increases after retirement will be at the rate of 4% per year. Because of the effect of the well-publicized "kicker" in the System's formula for calculating cost-of-living increases, the 4% annual CPI growth rate assumption translates roughly to a 5.2% annual increase in retired life benefits.

The report discusses the problem produced by applying ERISA standards to the Civil Service Plan, which is not governed by ERISA. The report points out that "the past service funding requirements of . . . ERISA . . . seem to require level dollar funding . . . Whether a level percentage of payroll funding of past service would be acceptable under ERISA for an inflation-indexed plan such as the Civil Service plan is problematical." This topic will probably get increasing attention in the private sector in the next few years, as actuaries become more familiar with ERISA requirements and at the same time presumably move increasingly to inflation-adjusted actuarial assumptions.

An added bonus for readers of the report is the set of detailed statistical tables in the appendices, including analyses of the changes in assumptions between 1970 and 1972. A major contributor to additional actuarial costs, inci-

dentally, was the assumption changes reflecting increased rates of retirement experienced by the System between valuations.

The actuarial profession owes a debt of gratitude to the Board of Actuaries, Edwin F. Boynton, F.S.A., Douglas C. Borton, F.S.A., and Russell R. Reagh, F.C.A.   □

1980 CENSUS

The Census Bureau is actively working on plans for the 1980 census and important decisions have to be made in the relatively near future. For example, the full content of the basic census questionnaire must be determined by the spring of 1977 so that further preparatory steps can be accomplished successfully.

Although there are many constraints on the census in terms of what and how much information can be collected and tabulated, the Bureau believes that it is very important to obtain and review the recommendations of as wide a range of users and potential users of decennial census data as possible. The Census Bureau is therefore anxious to have the ideas of the members of the Society of Actuaries.

If you have any suggestions, questions, or comments on the 1980 census, please send them to: Director, U.S. Bureau of the Census, Washington, D.C. 20233.

Actuarial Meetings

May 13, Baltimore Actuaries Club

May 18, Denver Actuarial Club

May 19, Seattle Actuarial Club

May 25, Joint Meeting—Boston and Hartford Actuaries' Clubs

June 10, Baltimore Actuaries Club

June 10, Denver Actuarial Club

June 10 and 11, Actuaries Club of Southwest

June 22, San Francisco Actuarial Club

	In Billions
Current Contribution Rate	$ 4.1
Normal Cost Plus Interest, Static Assumptions	6.8
Normal Cost Plus Level Percent of Payroll, Dynamic II Assumptions	12.1
Normal Cost Plus 40-Year Level Dollar (ERISA basis), Dynamic II Assumptions	17.8

Letters

The program is now supported by contributions from 17 Nebraska and 14 out-of-state insurance companies and consulting firms as well as by a number of individuals. These contributions are used, to provide an advisory grant to the Professor of Actuarial Science, to supplement the salary paid by the University, to provide for expenses of the program and of the professor not covered by the University, to provide scholarships for non-Nebraskan students, and to provide a program of rewards to students passing actuarial exams.

The purpose and program of the Committee have expanded over the years. Although its main function is to continue to obtain the necessary financial support for the program, the Committee is also involved in (1) promoting careers in actuarial science among the high school and college students in Nebraska, (2) promoting the actuarial science program in the states surrounding Nebraska, particularly through the actuarial clubs in those states, (3) assisting the Professor of Actuarial Science in curriculum development, and (4) working with the Chair of Actuarial Science to see that actuarial science courses, particularly basic actuarial mathematics courses, are available to home office employees in both Lincoln and Omaha.

The Chair has been fortunate in its occupants since it was founded. Dr. Robert E. Larson was the first professor and he was followed by Stephen G. Kellison. The current occupant following Mr. Kellison's departure in 1975 is Cecil D. Bykerk.

The Committee is most appreciative of the support it has received. We are grateful not only for the financial support from individuals, firms and companies both in and out of Nebraska, but also for the time given by members of the Nebraska Actuaries Club who work closely with the Committee. Without the assistance of these companies and these actuaries, we would not continue to have the outstanding program in actuarial science that now exists at the University of Nebraska.

Frederick Rickers, Chairman,
Committee for the Chair of
Actuarial Science

Ann Arbor Actuarial Conference

A conference on Classification Analysis and other topics in multivariate analysis will be held in the Chrysler Center for Continuing Education at the University of Michigan, Ann Arbor, Sept. 2, 3, and 4, 1976. The conference is sponsored by Casualty Actuarial Society, the Committee on Research of the Society of Actuaries, and the Departments of Mathematics and Statistics of the University of Michigan. Members of the Society of Actuaries, the Casualty Society and others interested in the subject are invited to attend. Attendance will be limited to approximately 100 persons.

The principal topic is classification of cases by the statistical analysis of many variables. Of particular interest will be methods which have developed rapidly with the availability of faster and larger computers in recent years. These include both general topics such as cluster analysis, logistic regression, discriminate analysis, and multi-dimensional scaling, as well as specific computer algorithms for these *and other data ransacking procedures.* Real applications to insurance data will be presented by the staff of the Life Insurance Marketing and Research Association.

Complete information can be obtained from Donald A. Jones, Department of Mathematics, University of Michigan, Ann Arbor, Mich. 48109.

Chicago

a Society meeting have the chance to meet at least a couple of them, in addition to Bern and myself. Two of the staff travel to each meeting to work behind the registration desk, handling the many questions and problems which arise, as well as doing the routine work of laying out badges, selling banquet tickets, and the like. This is but a small part of the work they have had to do for the meeting. Prior to the meeting, they and the others on the staff have prepared badges, mailed meeting notices, collected and recorded registration fees, and performed dozens of other tasks, all designed to make the meetings run smoothly.

The Society office staff is also responsible for handling the office work of the American Academy of Actuaries and the Conference of Actuaries in Public Practice. One person is responsible for the Academy, another for the Conference, although, of course, the rest of the st are available in case they need help. The Academy and Conference pay the Society for these services under the terms of a service agreement.

With all that they have to do, occasional errors are made; this might have happened to you. If it does, just let us know, so that we can correct the situation. In spite of the occasional error, I'm sure you'll agree that the staff does a very efficient job handling their many responsibilities.   *P.W.P.*

Canada Pension Plan Subsidies

Increasing the contribution rate to cover current benefits and expenses as a minimum would lead to an eventual contribution rate of 3.95% by both the employer and his employees by the year 2025.

Earlier this year the Canadian Labour Congress proposed that the Canada Pension Plan be expanded to provide pensions of 75% of earnings up to the Y.M.P.E. commencing at age 60. The government has estimated that such a benefit level would increase the eventual contributions required to over 15% for both the employer and employee. Clearly, this would be a distortion of national priorities in favour of the retired segment of the population and drastically diminish the role of private pensions and the accumulation of productive capital. The initial respo of the government was to oppose these changes but subsequently two steps have been taken:

(1) It was announced that the private pension plan system should be studied, and

(2) The Liberal Party, which is the party in power, adopted a resolution in favour of an increase in Canada Pension Plan benefits from 25% to 40% of covered earnings over a 10 year period.   □