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Educational Note

Assumptions for Hypothetical Wind-up and Solvency Valuations with Effective Dates Between December 31, 2007 and December 30, 2008

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Seeing Beyond Risk Canadian Institute of Actuaries Institut canadien des actuaires Voir au-delà du risque

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Assumptions for Hypothetical Wind-up and Solvency Valuations with Effective Dates Between December 31, 2007 and December 30, 2008

Committee on Pension Plan Financial Reporting

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Members should be familiar with educational notes. Educational notes describe but do not recommend practice in illustrative situations. They do not constitute Standards of Practice and are, therefore, not binding. They are, however, intended to illustrate the application (but not necessarily the only application) of the Standards of Practice, so there should be no conflict between them. They are intended to assist actuaries in applying Standards of Practice in respect of specific matters. Responsibility for the manner of application of Standards of Practice in specific circumstances remains that of the members in the pension practice area.

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Memorandum

To: All Pension Actuaries

From: Jacques Tremblay, Chairperson
Practice Council

Stephen Butterfield, Chairperson
Committee on Pension Plan Financial Reporting

Date: March 19, 2008

Subject: **Educational Note – Assumptions for Hypothetical Wind-up and Solvency Valuations with Effective Dates between December 31, 2007 and December 30, 2008**

This educational note provides guidance for 2008 on assumptions to be applied in hypothetical wind-up and solvency valuations. The Committee on Pension Plan Financial Reporting (PPFRC) would like to express its gratitude to Desjardins, Industrial Alliance, Standard Life and Sun Life for providing the committee with data.

The annuity survey was undertaken by a subcommittee of PPFRC, comprising: Stephen Butterfield, FCIA; Phil Rivard, FCIA; and Gavin Benjamin, FCIA.

In accordance with the Institute's Policy on Due Process for the Approval of Guidance Material other than Standards of Practice, this educational note has been prepared by the PPFRC and has received final approval for distribution by the Practice Council on March 7, 2008.

As outlined in subsection 1220 of the Standards of Practice, "*The actuary should be familiar with relevant educational notes and other designated educational material.*" That subsection explains further that a "*practice which the notes describe for a situation is not necessarily the only accepted practice for that situation and is not necessarily accepted actuarial practice for a different situation.*" As well, "*educational notes are intended to illustrate the application (but not necessarily the only application) of the standards, so there should be no conflict between them."*

If you have any questions or comments regarding this educational note, please contact Stephen Butterfield at his CIA Online Directory address, stephen.butterfield@towersperrin.com.

JT, SB

800-150 Metcalfe, Ottawa ON K2P 1P1
613.236.8196 613.233.4552
secretariat@actuaries.ca / secretariat@actuaires.ca
actuaries.ca / actuaires.ca

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1. INTRODUCTION

Under paragraph 3720.01 of the Standards of Practice, the assumptions used for actual and hypothetical wind-up valuations would

> *in respect of benefit entitlements that are expected to be settled by purchase of annuities, reflect single premium annuity rates, and*
>
> *in respect of benefit entitlements that are expected to be settled by lump sum transfer, reflect the recommendations respecting capitalized values.*

This document has been prepared by the Committee on Pension Plan Financial Reporting (PPFRC) and is intended to provide actuaries with guidance in selecting appropriate assumptions for these two assumed methods of settlement for hypothetical wind-up valuations and solvency valuations with effective dates between December 31, 2007 and December 30, 2008.

2. RETROACTIVE APPLICATION

If an actuary has issued a funding valuation report with a calculation date on or after December 31, 2007 before the publication of this guidance, the actuary would consider paragraph 1820.33 of the Standards of Practice, which states that a report may be invalidated if additional information becomes available about the entity as it was at the calculation date. The actuary would also consider paragraph 1520.07 of the Standards of Practice, which offers examples of events that provide additional information about an entity as it was at the calculation date. One of the examples cited in paragraph 1520.07 of the Standards of Practice is the publication of an experience study that provides information for the selection of assumptions. Finally, paragraph 1820.04 of the Standards of Practice states that an actuary should withdraw or amend a report if information that invalidates the report comes to hand subsequent to the report date.

The actuary would consider these sections of the Standards of Practice in determining how to proceed.

3. SETTLEMENT METHODS

To comply with paragraph 3720.01 of the Standards of Practice, the actuary would make an assumption for each class of plan members as to the portion of liabilities settled by annuity purchase or commuted value transfer. Classes of plan members would typically include at least

> active members not retirement eligible,
>
> active members retirement eligible,
>
> retired members and surviving spouses, and
>
> deferred vested members.

In determining the appropriate assumption for the method of settlement, the actuary would consider the following

> any legislative requirements to offer specific settlement options to various classes of members,

the settlement provisions of the plan and, in particular, the options to be provided to members upon plan wind-up,

the benefit provisions of the plan, for example,

where a plan has generous ancillary benefits, an election to receive a commuted value transfer may be affected by the maximum transfer limits imposed under section 8517 of the *Income Tax Act* (Canada) Regulations, or

where a plan has inflexible retirement options and few optional forms of payment, a member may prefer to elect a commuted value transfer to increase flexibility in payment terms,

when relevant, past experience of the plan, and

any experience from actual wind-ups of comparable plans of which the actuary may be aware.

All requirements of the Standards of Practice with respect to the development and reporting of assumptions would apply to this assumption.

4. BENEFITS ASSUMED TO BE SETTLED BY LUMP SUM TRANSFER

For all valuations, paragraph 3740.05 of the Standards of Practice applies. In particular, for a hypothetical wind-up valuation or a solvency valuation, that paragraph states, *"The actuary should assume that the wind-up date, the calculation date and the settlement date are coincident.*

Accordingly, the wind-up liabilities for benefits expected to be settled through the payment of a lump sum transfer would be determined in accordance with section 3800 applying the assumptions consistent with the particular valuation date.

5. BENEFITS ASSUMED TO BE SETTLED BY PURCHASE OF IMMEDIATE NON-INDEXED ANNUITIES

Data

The PPFRC has compiled information from four insurance companies active in the group annuity market with respect to group annuities sold during 2007. After reviewing the information provided, there were 47 group annuities sold by these insurance companies during 2007 that the PPFRC believes are representative of the competitive group annuity market. The total premiums for the 47 group annuities, in respect of non-indexed immediate annuities, were approximately $480 million, covering a total of 5,223 lives, and reflecting an average premium of approximately $92,000 per member. The amount of data is comparable to previous years and the PPFRC believes that the data yield credible results.

Methodology

The insurance companies were asked to determine the effective annual interest rate underlying each annuity purchase based on the sex-distinct UP94 Mortality Table, including mortality improvements projected to 2015 using Scale AA (UP94@2015). The PPFRC compared these interest rates to the unadjusted CANSIM V121758 rates, which

are the weekly series of the weighted average yields on Government of Canada bonds of maturity of 10 years and more. The CANSIM rates were taken at the dates nearest the annuity pricing dates (not necessarily the actual purchase dates).

Results and Conclusions

The analysis for immediate non-indexed group annuities with a total premium of at least $15 million was undertaken considering both 2007 data only and also the aggregate data for 2005, 2006 and 2007. The 2007 data included eight group annuities with premiums in respect of immediate non-indexed annuities in excess of $15 million (total premium of $259 million). These data indicate that the spread between the interest rates underlying the annuity purchases and the CANSIM V121758 rates has decreased compared to the data for 2005 and 2006. Further, when analyzing the data for all three years, a trend toward decreasing spreads is observed. The PPFRC is of the opinion that this decreasing spread is at least partially attributable to the insurance companies gradually reflecting improvements to mortality over the three-year period. As the survey has assumed the same static UP94@2015 mortality rates for all three years, the mortality improvements are revealed through decreasing interest rate spreads.

Therefore, the data suggest that, in most circumstances, an appropriate proxy for estimating the cost of purchasing a group annuity for immediate non-indexed pensions with a total premium of greater than $15 million, is currently 40 basis points above the yield on Government of Canada long-term bonds (series V121758) in conjunction with the UP94@2015 mortality tables. The PPFRC used the weekly unadjusted CANSIM Series V121758 in its analysis, since the exact date of pricing was not clear. However, actuaries would develop an appropriate assumption based on the applicable daily CANSIM Series (i.e., unadjusted CANSIM V39062).

This year's data for immediate non-indexed group annuity purchases continue to indicate clearly a correlation between the interest rate underlying the purchase price and the total premium. In particular, in cases where the total premium is less than $15 million, the data indicate that there is a smaller spread between the underlying interest rate and the yield on long-term Government of Canada bonds. For small annuity purchases, the data continue to indicate that the spread disappears. The PPFRC is of the opinion that these data accurately reflect the actual market for immediate non-indexed group annuities. As such, the data suggest that, in cases where the total group annuity purchase price for immediate non-indexed group annuities is expected to be less than $15 million, the spread between the interest rate underlying the annuity purchase and the yield on long-term Government of Canada bonds would grade linearly between 40 basis points and 0 basis points, based on the total expected premium.

As at December 31, 2007, the unadjusted CANSIM V39062 rate was 4.10%. This rate would form the basis for developing an appropriate underlying interest rate for valuations of immediate non-indexed group annuities with effective dates of December 31, 2007 and January 1, 2008. An applicable underlying interest rate for annuities with total premiums in excess of $15 million would then be determined as 4.10% + 0.40% = 4.50%. Prior to rounding, for very small annuity purchases, an applicable underlying interest rate would be determined as 4.10% + 0.00% = 4.10%.

Each actuary would use discretion in determining whether to round interest rates to the nearest multiple of 5, 10 or 25 basis points. Consistency in the application of such rounding would be followed.

6. BENEFITS ASSUMED TO BE SETTLED BY PURCHASE OF DEFERRED NON-INDEXED ANNUITIES

From the 47 group annuities mentioned earlier, 29 included some portion of deferred non-indexed annuitants. The total premium in respect of the deferred non-indexed annuitants was approximately $55 million.

The data revealed that the average spread between the interest rate underlying each annuity purchase and the unadjusted CANSIM V121758 rate at the same date was nil if the spread for each annuity purchase is weighted in accordance with the total premium. This is consistent with the spread revealed in last year's survey. The PPFRC believes that these data accurately reflect the actual market for deferred non-indexed group annuities.

Therefore, the data suggest that, in most circumstances, an appropriate proxy for estimating the cost of purchasing a group annuity for deferred non-indexed pensions would be based on the applicable daily CANSIM Series (i.e., unadjusted CANSIM V39062) in conjunction with the UP94@2015 mortality tables.

It is acknowledged that the amount of data available with respect to group deferred annuities is limited. Actuaries would, therefore, employ caution in applying this guidance to particular situations, given the large number of variables involved in the purchase of deferred annuities (i.e., deferral period, complexity of plan provisions, etc.).

7. INDEXED PENSIONS

For immediate indexed pensions, there continues to be insufficient data to provide credible guidance. However, based on the limited data that were received this year and in prior years, and considering discussions with representatives of the insurance carriers, an appropriate proxy for estimating the cost of purchasing an immediate group annuity where pensions are fully indexed to the rate of change in the Consumer Price Index (CPI) and with a total premium in excess of $15 million, is the yield on Government of Canada real return long-term bonds (series V39057) in conjunction with the UP94@2015 mortality tables. For purchases of less than $15 million, the spread between the interest rate underlying the purchase and the yield on Government of Canada real return long-term bonds would grade linearly between 0 basis points and -40 basis points, based on total expected premium. As at December 31, 2007, the unadjusted CANSIM V39057 rate was 1.91%.

In situations where pensions are partially indexed, indexed to a measure other than the Consumer Price Index or contain a deferred component, the actuary would make appropriate provisions for such situations consistent with the guidance provided in this educational note.

8. LARGE PLANS

Due to capacity constraints within the Canadian group annuity market, it is possible that large plans would not be able to purchase annuities upon plan wind-up. While the capacity of the group annuity market is not clearly known, the PPFRC believes that groups representing annuity liabilities exceeding approximately $500 million may have difficulty in effecting a purchase.

It may be possible to market a large annuity as a series of smaller annuities over a period of time, thereby enabling a plan with greater annuity liabilities to access the annuity market anyway. However, this approach may not be suitable, or even possible, in every instance. Further, large plans with inflationary increases tied to an external index (i.e., CPI related) would likely have difficulty in settling liabilities successfully through a group annuity purchase.

It is very difficult to predict how the benefits of members in receipt of a pension would be settled for large plans with effectively no access to group annuity markets. In the absence of any practical experience, the actuary would make a reasonable hypothesis for the manner in which the benefits may be settled. Based on this hypothesis, the actuary would then develop appropriate assumptions.

Note that, in most circumstances where an actual plan wind-up is hypothesized, the principles underlying the determination of annuity purchases would continue to apply. Accordingly, an actuary would be guided by the underlying philosophy used by insurance companies in pricing group annuities (i.e., that assets with characteristics similar to the liabilities are used to "immunize" the purchase).

9. MORTALITY

Whether or not the actuary is considering a settlement mechanism other than the purchase of annuities, the mortality experience of pensioners can be a factor in developing an appropriate basis. The determinant is whether there is credible and persistent mortality experience demonstrating substandard pensioner mortality. There is evidence that insurers may consider demonstrable substandard mortality experience when establishing the pricing basis for specific group annuities. Also, for large plans, where the actuary is hypothesizing an alternate settlement method (e.g., development of an "immunized" portfolio), it may be appropriate to reflect non-standard mortality in developing the expected cash flows to be immunized. Accordingly, provided the experience is credible and persistent, the actuary may reflect an appropriate adjustment to the UP94@2015 tables, whether the benefits are assumed to be settled through an actual annuity purchase or through an alternate settlement mechanism.

When reflecting substandard mortality, the actuary would be expected to make provision for future improvements in mortality in a manner consistent with the mortality improvements inherent in the assumed annuity purchase basis.

10. WIND-UP EXPENSES

Unless the actuary is satisfied that the expenses of wind-up are not to be charged to the pension fund, the actuary would make an assumption regarding these expenses and the

assumption would be explicit. Expenses normally include such items as fees related to preparation of the actuarial wind-up report, fees imposed by a pension supervisory authority, legal fees, commissions to buy annuities, as well as administrative, custodial and investment management expenses. Actuaries may refer to the educational note: Expenses in Funding Valuations for Pension Plans (document 207010) for further guidance.