Educational Note

Guidance for 2007 Assumptions for Hypothetical Wind-up and Solvency Valuations with Effective Dates between December 31, 2006 and December 30, 2007

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Document 207032

This document was archived June 12, 2023

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Guidance for 2007 Assumptions for Hypothetical Wind-up and Solvency Valuations with Effective Dates between December 31, 2006 and December 30, 2007

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Committee on Pension Plan Financial Reporting

April 2007

Document 207032

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Educational Notes do not constitute standards of practice. They are intended to assist actuaries in applying standards of practice in respect of specific matters. Responsibility for the manner of application of standards in specific circumstances remains that of the member in the Pension practice area.

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Memorandum

To: All Pension Practitioners

From: Stephen Butterfield, Chairperson
Committee on Pension Plan Financial Reporting

John Brierley, Chairperson
Practice Council

Date: April 11, 2007

Subject: **Educational Note – Guidance for 2007 on Assumptions for Hypothetical Wind-up and Solvency Valuations with Effective Dates between December 31, 2006 and December 30, 2007**

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This educational note provides guidance for 2007 on assumptions to be applied in hypothetical wind-up and solvency valuations.

In accordance with the Institute's Policy on Due Process for Approval of Practice-Related Material other than Standards of Practice, this educational note has been approved by the Committee on Pension Plan Financial Reporting (PPFRC) and has received final approval for distribution by the Practice Council on April 4, 2007.

As outlined in subsection 1220 of the Standards of Practice,

> *"The actuary should be familiar with relevant educational notes and other designated educational material.* [Effective December 1, 2002]
>
> Educational notes and other designated educational material describe but do not recommend practice in illustrative situations.
>
> 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.
>
> The 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."

The PPFRC would like to express its gratitude to Desjardins, Industrial Alliance, Standard Life and Sun Life for providing the committee with data. Like last year, the data were considerably more voluminous and reliable than that used in previous years and have been extremely helpful in enabling us to develop this guidance.

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Note: The annuity survey was undertaken, and this educational note was prepared, by a subcommittee of PPFRC, comprising: Stephen Butterfield, FCIA; Paul Chang, FCIA; and Martin Cyrenne, FCIA.

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1. INTRODUCTION

Under paragraph 3720.01 of the Standards of Practice, the assumptions used for a wind-up valuation (and hence a hypothetical wind-up and solvency valuation) 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, 2006 and December 30, 2007.

This guidance does not address the question of which group or whether the benefits for a specific group of active and/or deferred vested members would be valued using the annuity purchase assumption or the commuted value assumption. The actuary would review the plan provisions and the requirements of any applicable legislation to determine the answer to this question for any particular pension plan.

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2. RETROACTIVE APPLICATION

If an actuary has issued a funding valuation report with a calculation date on or after December 31, 2006 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 provides 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 after the report date.

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

3. 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.

4. 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 2006. After reviewing the information provided, there were 52 group annuities sold by these insurance companies during 2006 that the PPFRC believes are representative of the competitive group annuity market. The total premiums for the 52 group annuities, in respect of non-indexed immediate annuities, were approximately $538 million, covering a total of 5,783 lives, and reflecting an average premium of approximately $93,000 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

For immediate non-indexed group annuities with a total premium of at least $15 million, the data are very similar to the data collected in the previous two years. 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 45 basis points above the yield on Government of Canada long-term bonds (series V121758) in conjunction with the UP94@2015 mortality tables.

However, this year's data for immediate non-indexed group annuity purchases clearly indicate 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 lesser spread between the underlying interest rate and the yield on long-term Government of Canada bonds. In fact, for small annuity purchases, the data indicate that the spread disappears. Following discussions with representatives of the insurance companies, these data are considered to reflect the actual market for immediate non-indexed group annuities accurately. 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 45 basis points and 0 basis points, based on the total expected premium.

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

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assumption based on the applicable daily CANSIM Series (i.e., unadjusted CANSIM V39062).

As at December 29, 2006, the unadjusted CANSIM V39062 rate was 4.15%. 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, 2006 / January 1, 2007. Prior to rounding, an applicable underlying interest rate for annuities with total premiums in excess of $15 million would then be determined as 4.15% + 0.45% = 4.60%. For very small annuity purchases, an applicable underlying interest rate would be determined as 4.15% + 0.00% = 4.15%.

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

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

From the 52 group annuities mentioned earlier, 32 included some portion of deferred non-indexed annuitants. The total premium in respect of the deferred non-indexed annuitants was approximately $62 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. It is noted that this is lower than the 0.18% spread that was revealed in last year's survey. Following discussions with representatives of the insurance companies, these data are considered to reflect the actual market for deferred non-indexed group annuities accurately.

Therefore, the data suggests 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 all the variables inherent in the purchase of deferred annuities (i.e., deferral period, complexity of plan provisions, etc.).

6. INDEXED PENSIONS

The PPFRC received effectively no data with respect to the purchase of annuities where benefits are automatically indexed in accordance with the increases in some external index (e.g., CPI). Accordingly, the PPFRC is not able to provide any direct guidance on the appropriate basis to be used to value such annuities. The PPFRC does, however, believe that insurers would be inclined to back such annuities with assets that most closely match these liabilities. Accordingly, actuaries would be expected to take into consideration the fact that indexed pensions would likely be backed by assets with yields correlated to inflation. The most common of these assets are Government of Canada real return bonds. Therefore, while non-indexed annuities may be backed by provincial bonds

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and/or mortgages that provide higher yields than Government of Canada bonds, such assets may not be available for indexed annuities.

7. LARGE PLANS

Due to capacity constraints within the Canadian group annuity market, it is unlikely that large plans would 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 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 still to access the annuity market. However, the PPFRC recognizes 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 successfully settling liabilities 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. A committee of the CIA will undertake research on this subject. In the meantime, the PPFRC believes that 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, the PPFRC believes that 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.

8. 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 substandard 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.

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9. 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 administration, custodial and investment management expenses. Actuaries would refer to Educational Note: Expenses in Funding Valuations for Pension Plans for further guidance.

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