

Educational Note

Guidance for 2006 on Assumptions for Wind-up, Hypothetical Wind-up and Solvency Valuations with Effective Dates Between December 31, 2005 and December 30, 2006

Committee on Pension Plan Financial Reporting

April 2006

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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 practitioner.

Memorandum

To: All Pension Actuaries

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

Date: April 27, 2006

Subject: **Guidance for 2006 on Assumptions for Wind-up, Hypothetical Wind-up and Solvency Valuations with Effective Dates Between December 31, 2005 and December 30, 2006**

The Committee on Pension Plan Financial Reporting (PPFRC) has developed the attached guidance for 2006 on assumptions for wind-up, hypothetical wind-up and solvency valuations.

In accordance with the Institute's policy for Due Process, this educational note has been approved by the Committee on Pension Plan Financial Reporting, and has received final approval for distribution by the Practice Standards Council on April 27, 2006.

Educational notes are covered under subsection 1220 of the Standards of Practice. Subsection 1220 prescribes that "*The actuary should be familiar with relevant educational notes and other designated educational material.*" It further explains 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.*"

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GUIDANCE FOR 2006 ON ASSUMPTIONS FOR WIND-UP, HYPOTHETICAL WIND-UP AND SOLVENCY VALUATIONS WITH EFFECTIVE DATES BETWEEN DECEMBER 31, 2005 AND DECEMBER 30, 2006

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) should:

- “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 methods of settlement for hypothetical wind-up valuations and solvency valuations with effective dates between December 31, 2005 and December 30, 2006.

This educational note does not address the question of which group of active and/or deferred vested members should be valued using the annuity purchase assumption as opposed to the commuted value assumption. The actuary should review the plan provisions and the requirements of any applicable legislation to determine the answer to this question for any particular pension plan.

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, “*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 should be determined in accordance with the Standard of Practice for Determining Pension Commuted Values applying the assumptions consistent with the particular valuation date.

Benefits Assumed to be Settled by Purchase of Immediate Non-Indexed Annuities

Data

The PPFRC has compiled information from insurance companies active in the group annuity market with respect to group annuities sold during 2005. After reviewing the information provided, there were 64 group annuities sold by these insurance companies during 2005 which the PPFRC believes are representative of the competitive group annuity market. The total premiums for the 64 group annuities were approximately \$658 million, covering a total of 8,100 lives, reflecting an average premium of approximately \$81,000 per member. The amount of data is comparable to, but even more voluminous than that collected for 2004 group annuity purchases and the PPFRC believes that the data yield quite 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 B113867 rates, which are the weekly series of the weighted average yields on Government of Canada bonds of 10 years and over to maturity. The CANSIM rates were taken at the dates nearest the annuity pricing dates (not necessarily the actual purchase dates).

Results and Conclusions

The data revealed that the average spread between the interest rate underlying the immediate annuities component of each annuity purchase and the unadjusted CANSIM B113867 rate at the same date was 0.45%, if each annuity is weighted in accordance with the total premium. This result is remarkably similar to last year when this methodology of approaching insurance companies to obtain information on actual annuity purchases was instituted. This is very encouraging as it lends further credence to the reasonableness of the results.

Based on the results of this survey, the PPFRC observes that assuming mortality in accordance with the UP94@2015 Table, together with a flat solvency valuation discount rate equal to the unadjusted CANSIM B113867 rate, plus 0.45% would appear to be appropriate for the valuation of immediate non-indexed group annuities.

The PPFRC used the weekly CANSIM Series (B113867) in its analysis, since the exact date of pricing was not clear. However, the PPFRC believes that actuaries should develop an appropriate assumption based on the applicable daily CANSIM Series (i.e., CANSIM B114022).

As at December 30, 2005, the CANSIM B114022 rate was 4.06%. The PPFRC believes that this rate should form the basis for developing an appropriate underlying interest rate for valuing immediate non-indexed group annuities for valuations with effective dates of December 31, 2005/January 1, 2006. Prior to rounding, an applicable underlying interest rate would then be determined as $4.06\% + 0.45\% = 4.51\%$. Therefore, the data indicate that an appropriate basis for valuing immediate non-indexed group annuities for valuations with effective dates of December 31, 2005/January 1, 2006 for most plans will include an interest rate of 4.50% per year together with mortality in accordance with the UP94@2015 Table.

A similar approach (i.e., adding 0.45% to the applicable CANSIM B114022 rate) should be used to determine the appropriate assumption for valuation dates other than December 31, 2005/January 1, 2006 and prior to December 31, 2006.

Each actuary should 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 should be followed.

Differentiating by Size

The data display absolutely no correlation between the average premium per member and the spread between the interest rate underlying each annuity purchase and the unadjusted CANSIM B113867 rate at the same date. We note, however, that there does appear to be moderate correlation (about 40%) emerging between the total premium and the spread between the interest rate underlying each annuity purchase and the unadjusted CANSIM B113867 rate at the same date. Such correlation is not sufficiently robust to prompt this

educational note to advise actuaries to take this into account when setting the discount rate to be used for annuity purchase although this phenomenon, if it continues to be supported by the data, may warrant further study.

Benefits Assumed to be Settled by Purchase of Deferred Non-Indexed Annuities

Of the 64 group annuities included in the data used by PPFRC, 34 included some portion of deferred annuitants. We estimate that the total premium in respect of the deferred annuitants was roughly \$99 million.

The data revealed that the average spread between the interest rate underlying each annuity purchase and the unadjusted CANSIM B113867 rate at the same date was 0.18% if each annuity is weighted in accordance with the total premium. This compares to the 0.20% spread that was revealed in last year's survey.

Based on the results of this survey, the PPFRC observes that assuming mortality in accordance with the UP94@2015 Table, together with a flat solvency valuation discount rate equal to the unadjusted CANSIM B114022 rate, plus 0.20% would appear to be appropriate for the valuation of deferred non-indexed group annuities.

This is the second year that reliable information was available with respect to the basis underlying deferred annuities. While the total premiums of \$99 million do not represent a huge sample size, the fact that the results are very consistent with last year lends credence to the results. Nevertheless, actuaries should still 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.).

Indexed Pensions

The PPFRC received effectively no data with respect to the purchase of annuities where benefits are automatically indexed in accordance with increases in some external index (e.g., Consumer Price Index (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 and/or mortgages which provide higher yields than Government of Canada bonds, such assets may not be available for indexed annuities.

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 to still 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. The PPFRC intends to conduct further research into this issue over the next year. In the meantime, the PPFRC believes that the actuary should 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 should continue to apply. Accordingly, an actuary should be guided by the underlying philosophy used by insurance companies in pricing group annuities, being that assets with characteristics similar to the liabilities are used to “immunize” the purchase.

Mortality

Whether or not the actuary is considering a settlement mechanism different 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.

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 should make an assumption regarding these expenses and the assumption should 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, administration, custodial and investment management expenses.

Assistance of Insurance Company Representatives

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

Note: The annuity survey was undertaken, and this report was prepared, by a sub-committee of PPFRC, comprising: Stephen Butterfield, Lorne Cohen and Jeff Kissack.