Canadian Institute of Actuaries
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Educational Note

Assumptions for Hypothetical Wind-Up and Solvency Valuations with Effective Dates Between December 31, 2008 and December 30, 2009

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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.

Memorandum

To: All Pension Actuaries

From: Jacques Tremblay, Chairperson
Practice Council

Michael Banks, Chairperson
Committee on Pension Plan Financial Reporting

Date: April 9, 2009

Subject: **Educational Note – Assumptions for Hypothetical Wind-up and Solvency Valuations with Effective Dates between December 31, 2008 and December 30, 2009**

Document 209035

This educational note provides guidance on assumptions to be used for hypothetical wind-up and solvency valuations for 2009 and revises the guidance for certain assumptions for valuations with effective dates between February 29, 2008 and December 30, 2008 from that provided in the March 2008 Educational Note, Assumptions for Hypothetical Wind-up and Solvency Valuations with Effective Dates Between December 31, 2007 and December 30, 2008. This educational note also revises initial guidance for 2009 assumptions that was provided in announcements issued on February 11, 2009 and March 4, 2009.

The Committee on Pension Plan Financial Reporting (PPFRC) would like to express its gratitude to AIG, Desjardins, Industrial Alliance, Manulife, Standard Life and Sun Life for providing the committee with data.

The annuity survey was undertaken by a subcommittee of PPFRC, comprising: Michael Banks, FCIA; Gavin Benjamin, FCIA; and Pierre Girardin, 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 April 8, 2009.

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 Michael Banks at his CIA Online Directory address, Michael.Banks@mercer.com.

JT, MB

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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, 2008 and December 30, 2009.

This document revises the guidance for certain assumptions for valuations with effective dates between February 29, 2008 and December 30, 2008 from that which was provided in the March 2008 Educational Note, Assumptions for Hypothetical Wind-up and Solvency Valuations with Effective Dates Between December 31, 2007 and December 30, 2008. This Educational Note also revises initial guidance for 2009 assumptions that was provided in announcements issued on February 11, 2009 and March 4, 2009.

2. 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.

3. BENEFITS ASSUMED TO BE SETTLED BY LUMP SUM TRANSFER

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

Accordingly, except for situations noted in the paragraph below, 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.

On December 8, 2008, the Actuarial Standards Board approved changes to section 3800, which has become effective on April 1, 2009. However, early implementation of the changes to section 3800 is permitted for hypothetical wind-up and solvency valuations with effective dates on or after December 12, 2008 if appropriate to the circumstances of the plan and if permitted by the applicable pension regulator. Further, pursuant to paragraph 3750.02 of the Standards of Practice, the new commuted value Standards may be used for a solvency valuation effective prior to December 12, 2008 where permitted by a pension regulator and called for by the terms of the actuary's engagement. However, the Standards of Practice do not provide for the use of the new commuted value Standards for hypothetical wind-up valuations effective prior to December 12, 2008.

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

Data

The PPFRC has compiled information from six insurance companies active in the group annuity market with respect to group annuities sold during 2008. The insurance companies provided the information on the condition that only PPFRC members would have access to the detailed data. After reviewing the information provided, there were 127 group annuities sold by these insurance companies during 2008 that the PPFRC believes are representative of the competitive group annuity market. The total premiums for the 127 group annuities, in respect of non-indexed immediate annuities, were approximately $526 million, covering a total of 5,511 lives, and reflecting an average premium of approximately $95,000 per member. The amount of data is more than in previous years.

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 (referred to below as the "spread"). The CANSIM rates were taken at the dates nearest the annuity pricing dates (not necessarily the actual purchase dates).

Initial Analysis

Initially, the analysis for immediate non-indexed group annuities with a total premium of at least $15 million was undertaken considering both 2008 data only and also the aggregate data for 2006, 2007 and 2008. The data revealed a significant change in the 2008 pricing basis from the 2006 and 2007 calendar years. This change, presumably, reflects the dramatic increase during 2008 in the yield spreads for bonds other than Government of Canada bonds over Government of Canada bonds. As a result, the PPFRC concluded that the analysis should focus only on the 2008 data. The 2008 data included 13 group annuities with premiums in respect of immediate non-indexed annuities in excess of $15 million (total premium of $309 million). For these data, the spread varied from a low of 80 basis points to a high of 180 basis points. (The purchase with a spread of 180 basis points, which occurred in mid-September 2008, appeared at the time to be an outlier relative to the other purchases.) The range of spreads indicates that annuity pricing exhibited considerable volatility in 2008.

The higher spreads over Government of Canada bond yields relative to the 2007 insurer data began to emerge in February of 2008. The PPFRC also considered whether there was evidence that the spreads changed in late 2008 during which time there was considerable turbulence in the capital markets. This analysis proved to be difficult due to the limited amount of data and the fact that the data included only one purchase with total premium in excess of $15 million in each of November and December. The December purchase occurred during the middle of the month. As in previous years, no purchases occurred on December 31. The PPFRC did observe, however, that the average spread for purchases with a total premium in excess of $15 million was approximately 110 basis points during the period from March to June 2008 and approximately 120 basis points during the second half of 2008. (If the purchase with a spread of 180 basis points mentioned above is considered an outlier and removed from the averages, the average spread during the second half of 2008 was approximately 110 basis points.) Overall, the PPFRC concluded at the time that the data did not provide sufficient evidence that the spreads changed significantly in late 2008.

Based on the analysis described above, an announcement was issued on February 11, 2009 providing preliminary guidance regarding assumptions for hypothetical wind-up and solvency valuations pending issuance of this annual Educational Note. The guidance suggested that 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, for valuations effective on or after February 29, 2008 would be 110 basis points added arithmetically to the unadjusted yield on Government of Canada long-term bonds (series V121758) in conjunction with the UP94@2015 mortality tables.

Additional Group Annuity Data

Subsequent to the February 11, 2009 announcement, additional group annuity data were provided by several consulting firms which included three purchases that occurred in late 2008 and two purchases that occurred in early 2009 each with total premium in excess of \$15 million. Including this additional data, the average spread for the November and December 2008 purchases was approximately 140 basis points. After considering these additional data, the PPFRC concluded that there is evidence that the spreads increased even further starting in November 2008 and that the increased spreads persisted into early 2009.

Conclusion – Immediate Non-indexed Group Annuities over \$15 million

The data suggest that 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, for valuation dates between February 29, 2008 and October 30, 2008, inclusive, would be 110 basis points added arithmetically to the unadjusted yield on Government of Canada long-term bonds (series V121758) in conjunction with the UP94@2015 mortality tables. For valuation dates on or after October 31, 2008, an appropriate interest rate would be 140 basis points added arithmetically to the unadjusted 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).

Immediate Non-indexed Group Annuities under \$15 million

This year's data for immediate non-indexed group annuity purchases continue to indicate a correlation between the interest rate underlying the purchase price and the total premium. In cases where the total premium is less than \$15 million, the spreads were volatile in 2008 and ranged from negative 50 basis points to 180 basis points. The average premium per retiree was \$79,000. The data overall indicate that there is a smaller spread between the underlying interest rate and the yield on Government of Canada long-term bonds for smaller rather than larger group annuity purchases.

The observed differential between the interest rates underlying smaller group annuity purchases and those for annuities with total premium in excess of \$15 million for 2008 was, on average, quite consistent with that observed in prior years. Further, based on limited data, it appears that spreads for smaller group annuity purchases increased in November and December 2008 to a similar extent as indicated by the expanded data for annuities with total premium in excess of \$15 million. Accordingly, to estimate the cost of group annuities with total premium of less than \$15 million, for valuation dates on or after February 29, 2008, it is appropriate to use the interest rate applicable to group annuities with total premium over \$15 million at the valuation date less a deduction which grades linearly from 40 basis points for a total premium of zero to zero for a total premium of $15 million, in conjunction with the UP94@2015 mortality tables.

Example

As at December 31, 2008, the unadjusted CANSIM V39062 rate was 3.45%. 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, 2008 and January 1, 2009 to be used in conjunction with the UP94@2015 mortality tables. Prior to rounding, an applicable underlying interest rate for annuities with total premiums in excess of $15 million would then be determined as 3.45% + 1.40% = 4.85%. Prior to rounding, for very small annuity purchases, an applicable underlying interest rate would be determined as 4.85% - 0.40% = 4.45%.

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.

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

From the 127 group annuities mentioned earlier, 43 included some portion of deferred non-indexed annuitants. The total premium in respect of the deferred non-indexed annuitants was approximately $30 million.

Consistent with prior years, the data suggest that an appropriate proxy for estimating the cost of purchasing a group annuity for deferred non-indexed pensions would be 40 basis points below the interest rates indicated above for valuation dates on or after February 29, 2008 for immediate group annuities with total premium in excess of $15 million at the valuation date 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.).

6. 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 unadjusted 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 unadjusted yield on Government of Canada real return long-term bonds would grade linearly between 0 basis points and negative 40 basis points, based on total expected premium. As at December 31, 2008, the unadjusted CANSIM V39057 rate was 2.10%.

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.

7. INDIVIDUAL ANNUITY PRICING

On February 12, 2009, a member posted information to the pension listserver regarding individual annuity quotations obtained on December 31, 2008. These data indicate that the implicit yield for non-indexed annuities underlying the December 31, 2008 individual annuity quotes was significantly higher than the interest rates indicated in the February 11, 2009 guidance. The PPFRC reviewed the information posted on February 12, 2009.

The PPFRC observes that, particularly during a period of capital market turbulence, the pricing of individual and group annuities can differ for reasons such as,

- there is a greater risk of anti-selection for individual annuities,
- the size of the average monthly pension is usually larger for individual annuities,
- individual annuities may have less complex ancillary features,
- the ability to find appropriate fixed income investments to back the annuity obligation may be less of an issue for individual annuities due to the relatively small premium size, particularly during a period in which many fixed income instruments are highly illiquid, and
- the group annuity pricing is underwritten at the time of the quote, while individual annuity pricing for a particular quote may be "automated".

The PPFRC concluded that, due to the various reasons why individual and group annuity pricing may differ, the information regarding individual annuity quotations obtained on December 31, 2008 does not invalidate the guidance for group annuities contained in this Educational Note. However, where an actuary considers that a plan's hypothetical wind-up or solvency obligations could be settled by the purchase of individual annuities, yields based on relevant individual annuity quotations could be reflected in establishing the annuity purchase discount rate assumption.

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 fixed income 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 provisions 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, costs related to the purchase of annuities and administrative costs related to the settlement of benefits. Actuaries may refer to the Educational Note: Expenses in Funding Valuations for Pension Plans (document 207010) for further guidance.

11. RETROACTIVE APPLICATION

If an actuary has already prepared a funding valuation report with an effective date on or after February 29, 2008 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.

Application of the revised guidance to a valuation that has been issued with an effective date on or after February 29, 2008 will in some cases materially reduce solvency liabilities and minimum required contributions. In such cases, it would be appropriate for the actuary to advise the plan sponsor or plan administrator and seek the plan sponsor's or plan administrator's direction as to whether a revised report should be prepared. However, in cases where revising the results of a valuation would reduce contribution requirements, it is likely that the Standards of Practice would not necessitate the revision of a report that has already been prepared.

12. FUTURE GUIDANCE

The guidance contained in this document is intended to be applicable to hypothetical wind-up valuations and solvency valuations with effective dates up to December 30, 2009. Given the significant change in annuity pricing that occurred in 2008, it is apparent that further significant change could occur at any time. Also, it appears that annuity pricing has exhibited considerable volatility in early 2009.

The PPFRC is investigating whether more frequent data can be obtained with a view to adjusting the guidance on a more timely basis if the need arises. More frequent data may possibly be obtained by receiving quotes from insurers periodically based on illustrative blocks of business rather than actual sold annuities. However, all methodologies investigated have limitations and are highly dependent on the goodwill of insurers to provide data.

Actuaries may use the spreads indicated above based on the 2008 survey data for valuations with effective dates on and after December 31, 2008 up to December 30, 2009, pending such further guidance or other evidence of change in annuity pricing.

PPFRC is also reviewing whether additional guidance can be provided with respect to settlement of benefits for large plans.

Responsibility for the manner of application of Standards of Practice in specific circumstances remains that of the member in the pension practice area.