Canadian Institute of Actuaries
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# Educational Note Supplement

# Guidance for Assumptions for Hypothetical Wind-Up and Solvency Valuations Update – Effective September 30, 2013, and Applicable to Valuations with Effective Dates Between September 30, 2013, and December 30, 2013

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Document 213099

This document was archived June 12, 2023

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# Memorandum

**To:** All Pension Actuaries

**From:** Bruce Langstroth, Chair
Practice Council

Manuel Monteiro, Chair
Committee on Pension Plan Financial Reporting

**Date:** November 13, 2013

**Subject:** **Educational Note Supplement: Guidance for Assumptions for Hypothetical Wind-Up and Solvency Valuations Update – Effective September 30, 2013, and Applicable to Valuations with Effective Dates between September 30, 2013, and December 30, 2013**

*Document 213099*

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The most recent quarterly guidance from the Committee on Pension Plan Financial Reporting (PPFRC) regarding assumptions for hypothetical wind-up and solvency valuations, effective June 30, 2013, was provided in the revised educational note supplement dated October 15, 2013. The guidance provided in that revised educational note supplement modified the guidance contained in the educational note dated June 11, 2013, for valuations with effective dates on and after June 30, 2013 (but no later than December 30, 2013).

The PPFRC has conducted its quarterly review of group annuity pricing conditions as at September 30, 2013, and has determined that a revision to its guidance regarding assumptions for hypothetical wind-up and solvency valuations is appropriate for valuations with effective dates on or after September 30, 2013 (but no later than December 30, 2013). The revisions to the guidance are contained in this educational note supplement.

## DUE PROCESS

The Policy on Due Process for the Approval of Guidance Material Other than Standards of Practice was followed in the development of these revisions.

## CONTACT INFORMATION

Questions should be addressed to Manuel Monteiro, Chair of the PPFRC, at manuel.monteiro@mercer.com.

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## NON-INDEXED ANNUITY PROXY

### Previous Guidance

The most recent guidance from the Committee on Pension Plan Financial Reporting (PPFRC) concluded that for valuations with effective dates on or after June 30, 2013 (but no later than December 30, 2013), an appropriate discount rate for estimating the cost of purchasing a non-indexed group annuity would be determined as the unadjusted average yield on Government of Canada (GoC) marketable bonds with maturities over 10 years (CANSIM series V39062) increased arithmetically by between 40 to 70 basis points (bps), in conjunction with the UP94 generational mortality tables (based on the AA scale). The spread above the CANSIM series V39062 would be determined based on the duration of the liabilities expected to be settled through the purchase of a group annuity.

This guidance was based on quotes provided by eight insurance companies on illustrative group annuities using pricing conditions as at June 30, 2013, supplemented by data from certain actuarial consulting firms on actual group annuity purchases during the second quarter of 2013. Furthermore, this guidance applied to both immediate and deferred pensions, and also applied regardless of the overall size of the group annuity purchase.

### Analysis

The PPFRC obtained hypothetical quotes on the same illustrative blocks of business used to develop the previous guidance. The characteristics of the three blocks are as follows:

| **Duration** | **Low** | **Medium** | **High** |
|---|---|---|---|
| Duration at September 30, 2013 | 7.6 | 9.9 | 12.2 |
| Approximate premium at September 30, 2013 | $16 million | $21 million | $21 million |
| Average monthly pension | $897 | $897 | $897 |
| Proportion of liability for deferred members | 0% | 4% | 12% |

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For the purpose of this guidance, the durations of the illustrative blocks shown above were determined by calculating the impact of a 0.01% change in the discount rate, and using the following formula:

[(Estimated Purchase Price at 3.77% / Estimated Purchase Price at 3.78%) – 1] / 0.01%

where 3.77% is equal to the CANSIM V39062 yield of 2.97% plus 80 bps at September 30, 2013, being the guidance for the block with medium duration (as described below). Note that as discount rates change over time, so would the duration of the three blocks.

The PPFRC obtained hypothetical quotes on the above three blocks of business from the eight insurers based on pricing conditions as at September 30, 2013. The PPFRC also obtained limited data from certain actuarial consulting firms on actual group annuity purchases during the third quarter of 2013. The hypothetical quotations at June 30, 2013, and September 30, 2013, may be summarized as follows:

| AVERAGE OF THE THREE MOST COMPETITIVE QUOTES (USING UP94 GENERATIONAL MORTALITY TABLES) | | | | | | |
|---|---|---|---|---|---|---|
| | 30/06/2013 | | | 30/09/2013 | | |
| | **Low duration** | **Medium duration** | **High duration** | **Low duration** | **Medium duration** | **High duration** |
| **Discount rate** | 3.23% | 3.43% | 3.56% | 3.56% | 3.79% | 3.90% |
| **Spread over CANSIM V39062** | + 39 bps | + 59 bps | + 72 bps | + 59 bps | + 82 bps | + 93 bps |

While very limited, the data obtained on actual annuity purchases during the third quarter were consistent with the above results.

**Guidance for Non-indexed Pensions**

As a result of this analysis, the PPFRC has concluded that effective September 30, 2013, the cost of purchasing non-indexed annuities would be estimated based on the duration of the liabilities expected to be settled through the purchase of annuities. The process for estimating the cost of purchasing non-indexed annuities would be as follows:

1. Determine the duration *of the portion of the liabilities assumed to be settled through the purchase of annuities,* based on the impact of a change in discount rate from 3.77% (CANSIM V39062 plus 80 bps at September 30, 2013).
2. Using the duration obtained in step 1, interpolate using the following table to determine the appropriate spread above unadjusted CANSIM V39062:

   | **Illustrative block** | **Duration based on 3.77% discount rate** | **Spread above unadjusted CANSIM V39062** |
   |---|---|---|
   | Low duration | 7.6 | + 60 bps |
   | Medium duration | 9.9 | + 80 bps |
   | High duration | 12.2 | + 90 bps |

   If the duration of the portion of the liabilities assumed to be settled through the purchase of annuities is lower than 7.6 or higher than 12.2, the actuary would make a reasonable assumption regarding the appropriate spread.

   The PPFRC believes that groups with durations higher than 12.2 would likely include a large proportion of deferred vested members. While the higher duration, in isolation, would be expected to result in lower pricing, the PPFRC believes that this impact would be offset by added administrative costs and risks that insurers would incur in assuming these obligations. The PPFRC also believes that it is rare that a group would have a duration materially lower than 7.6. Therefore, as of September 30, 2013, the PPFRC believes that one reasonable approach would be to assume that the spread for durations lower than 7.6 is 60 bps, and the spread for durations higher than 12.2 is 90 bps. Other approaches may also be reasonable.
3. The cost of purchasing annuities should be estimated using an interest rate determined as the unadjusted CANSIM V39062 increased arithmetically by the spread calculated in step 2, in conjunction with the UP94 generational mortality tables.

The above guidance applies to both immediate and deferred pensions and also applies regardless of the overall size of the group annuity purchase. It applies to valuations with effective dates on

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and after September 30, 2013, pending any further guidance or other evidence of change in annuity pricing.

**Example**

As at September 30, 2013, the unadjusted CANSIM V39062 was 2.97%; therefore the guidance for the medium duration would be 3.77% (i.e., + 80 bps). If the duration of the liabilities assumed to be settled through the purchase of annuities is determined to be 11 based on a change in discount rate from 3.77% to 3.78%, the appropriate spread above the unadjusted CANSIM V39062 would be determined as:

[Medium spread · (High duration – 11) + High spread · (11 – Medium duration)]/
[High duration – Medium duration]

[80 bps · (12.2 – 11) + 90 bps · (11 – 9.9)]/ [12.2 – 9.9] = 85 bps

Prior to rounding, an applicable underlying discount rate would then be determined as 2.97% + 0.85% = 3.82%.

## CPI-INDEXED ANNUITY PROXY

### Previous Guidance

The most recent guidance from PPFRC concluded that for valuations with effective dates on or after June 30, 2013 (but no later than December 30, 2013), an appropriate discount rate for estimating the cost of purchasing a group annuity where pensions are fully indexed to the rate of change in the Consumer Price Index (CPI) would be the unadjusted yield on Government of Canada real-return long-term bonds (CANSIM series V39057) reduced arithmetically by 120 bps, in conjunction with the UP94 generational mortality tables (based on the AA improvement scale).

This guidance applied to both immediate and deferred pensions, regardless of the overall size of the group annuity purchase, and regardless of duration.

### Analysis

Most of the contributing insurers also provided illustrative quote data for the three new sample blocks on a CPI-indexed basis as of September 30, 2013. The illustrative quotations as at June 30, 2013, and September 30, 2013, for the medium-duration block may be summarized as follows:

| AVERAGE OF THE THREE MOST COMPETITIVE QUOTES (USING UP94 GENERATIONAL MORTALITY TABLES) | | |
|---|---|---|
| | **30/06/2013** | **30/09/2013** |
| **Discount rate** | -0.15% | 0.09% |
| **Spread over CANSIM V39057** | -120 bps | -104 bps |

While there is some indication that the pricing of CPI-indexed annuities may also vary by duration, the PPFRC has concluded that there are insufficient data at this stage to introduce this level of refinement. Consequently, the guidance contained herein is applicable to CPI-indexed annuities regardless of their duration.

There were no quantitative data obtained on actual indexed annuity purchases during the third quarter.

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**Guidance for Fully CPI-Indexed Pensions**

Based on the pricing received, the PPFRC has determined that an appropriate proxy for estimating the cost of purchasing a group annuity where pensions are fully indexed to the rate of change in the CPI would be the unadjusted yield on Government of Canada real-return long-term bonds (CANSIM series V39057) reduced arithmetically by 100 bps, in conjunction with the UP94 generational mortality tables (with the AA improvement scale).

The above guidance applies to both immediate and deferred pensions, regardless of the overall size of the group annuity purchase and regardless of duration. It applies to valuations with effective dates on and after September 30, 2013, pending any further guidance or other evidence of change in annuity pricing.

**Example**

As at September 30, 2013, the unadjusted yield on Government of Canada real-return long-term bonds (CANSIM series V39057) was 1.13%. Therefore, prior to rounding, an applicable underlying discount rate would then be determined as 1.13% - 1.00% = 0.13%.

**Partially-Indexed Annuities**

In situations where pensions are partially indexed, indexed to a measure other than the CPI, or contain a deferred component, the actuary would make appropriate provisions for such situations consistent with the guidance provided in the annual educational note dated June 11, 2013, modified to reflect the revised guidance contained in this educational note supplement.

Since there are significant variations in the types of partially-indexed provisions, it is not feasible to provide guidance that would apply in all possible circumstances. However, in a simplest case, where the indexation is a percentage of CPI without any offsets, caps, or floors, an appropriate implicit discount rate would be determined as follows:

(Indexation %) · Fully-indexed proxy + (1- Indexation %) · Non-indexed proxy

For purposes of determining the non-indexed proxy in the above formula, the duration of the portion of the liabilities assumed to be settled through the purchase of annuities should be determined as if the pensions were *not* indexed.

For example, for a plan that provides indexing based on 75% of the CPI increase without any offsets, caps, or floors, and where the duration of the group expected to be settled through the purchase of annuities (determined as if the pensions were not indexed) is 11, an appropriate discount rate as at September 30, 2013, would be determined as 75% · (0.13%) + (1 - 75%) · 3.82% = 1.05%.

**VALIDITY OF JUNE 11, 2013, EDUCATIONAL NOTE**

Except as noted above, actuaries would continue to reference the June 11, 2013, educational note for guidance with respect to the selection of assumptions for hypothetical wind-up and solvency valuations with effective dates between December 31, 2012, and December 30, 2013.

**ACTUAL ANNUITY PRICING**

The purpose of this educational note supplement is to provide actuaries with guidance related to the establishment of assumptions for hypothetical wind-up and solvency valuations. It is worth noting that the pricing for an actual group annuity purchase depends on many factors, with the

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result that the actual price may differ from the guidance provided herein. In addition to the duration of the purchase, some of the other factors that may affect pricing of a particular purchase include, but are not limited to:

- The overall size of the purchase;
- The proportion of deferred vested members included in the group being purchased;
- The average pension amount for the pensions being purchased;
- The mortality experience anticipated by the insurance companies bidding on the purchase; and
- Competitive pressures in the group annuity market at the time of the purchase.

**RETROACTIVE APPLICATION**

If an actuary has already prepared a funding valuation report with an effective date on or after September 30, 2013, before the publication of this guidance, the actuary would consider paragraphs 1820.30 through 1820.36 of the Standards of Practice to determine whether it is necessary to withdraw or amend the report.

**ADDITIONAL COMMENTS**

The PPFRC intends to continue monitoring group annuity pricing on a quarterly basis. Actuaries may use the spreads indicated above for valuations with effective dates on and after September 30, 2013, up to December 30, 2013, pending any future guidance or other evidence of change in annuity pricing.

The PPFRC is continuing to review some other aspects of group annuity purchase pricing that may result in revisions to future guidance. In particular, the underlying basis used to express the non-indexed annuity guidance is being reviewed. Currently, the non-indexed annuity guidance is expressed as a spread over yields on GoC long-term bonds in conjunction with the UP94 generational mortality tables, irrespective of the basis used by insurers when submitting quotes. The PPFRC is exploring whether other bases may be more appropriate to provide more stability in the resulting spreads.

It may be noted that the spreads versus GoC long-term bonds for group annuity pricing have been volatile during the past three to four years. Actuaries may wish to be mindful of this volatility when communicating advice related to future hypothetical wind-up and solvency valuations.

**DISCLAIMER**

Members should be familiar with educational note supplements. Educational note supplements expound or update the guidance provided in an educational note. They do not constitute standards of practice and are, therefore, not binding. They are, however, in conjunction with the source educational note, 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.

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