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Revised Educational Note Supplement

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

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Memorandum

To: All Pension Actuaries

From: Manuel Monteiro, Chair
Committee on Pension Plan Financial Reporting
Bruce Langstroth, Chair
Practice Council

Date: October 15, 2013

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

Document 213081

The most recent quarterly guidance from the Committee on Pension Plan Financial Reporting (PPFRC) regarding assumptions for hypothetical wind-up and solvency valuations, effective March 31, 2013, was provided in an [educational note supplement](#) dated June 25, 2013. That guidance confirmed the guidance contained in the [annual educational note](#) dated June 11, 2013, for valuations with effective dates on and after December 31, 2012 (but no later than December 30, 2013).

In addition to the usual quarterly monitoring of group annuity pricing, the PPFRC has conducted extensive research and analysis over the last 18 months on various aspects of the group annuity market. This review has resulted in significant revisions to the guidance, effective June 30, 2013. The key changes to the guidance are:

- The cost of purchasing non-indexed annuities would be estimated using the duration of the liabilities expected to be settled through the purchase of annuities; and
- The cost of purchasing annuities that are fully indexed to Consumer Price Index (CPI) increases would be estimated using a discount rate less than the yield on Government of Canada real-return long-term bonds.

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

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NON-INDEXED ANNUITY PROXY

Previous Guidance

The previous guidance determined that 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 70 basis points (bps), in conjunction with the UP94 generational mortality tables (based on the AA scale).

The above guidance applied to both immediate and deferred pensions and also applied regardless of the overall size of the group annuity purchase. It was based on quotes provided by eight insurance companies on illustrative group annuities using pricing conditions as at March 31, 2013, supplemented by data from certain actuarial consulting firms on actual group annuity purchases during the first quarter of 2013.

Rationale for Extensive Review

Since 2009, the PPFRC guidance on the estimated cost of purchasing non-indexed annuities has been partly based on the pricing obtained from insurers on two illustrative blocks of business—one block was intended to be representative of a large purchase (premium greater than \$15 million) and the other to be representative of a small purchase (i.e., premium less than \$15 million). Both the large and small blocks included pensioners and deferred vested members. Over the last few years, the PPFRC has observed that the pricing for the small block has generally been more favourable than the pricing for the large block. In addition, the pricing for the deferred vested members has generally been more favourable than the pricing for the pensioners. Both these observations reversed from prior periods that showed more favourable pricing for the large block than the small block and more favourable pricing for pensioners than deferred vested members. Following discussions with various insurers, the PPFRC concluded that the primary reason for these observations is that the duration of the small block is significantly higher than the duration of the large block, in part due to the inclusion of proportionately more deferred vested members. The effect of duration was also noted in actual annuity purchases. Due to the steeply upward sloping yield curve in recent years, most insurers have offered more favourable pricing for longer-duration groups than shorter-duration groups.

Analysis

The PPFRC concluded that the duration of the liabilities expected to be settled through the purchase of annuities is a more important determinant of the cost of purchasing non-indexed annuities than the size of the purchase or the deferred vested/pensioner split.

Consequently, the PPFRC developed new illustrative blocks of business of three different durations and obtained hypothetical quotes on these blocks. The characteristics of the three blocks are as follows:

Duration	Low	Medium	High
Duration at June 30, 2013	7.8	10.2	12.5
Approximate premium	\$17 million	\$22 million	\$22 million
Average monthly pension	\$897	\$897	\$897
Proportion of liability for deferred members	0%	4%	12%

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:

$$[(\text{Estimated Purchase Price at 3.44\%} / \text{Estimated Purchase Price at 3.45\%}) - 1] / 0.01\%$$

where 3.44% is equal to the CANSIM V39062 yield of 2.84% plus 60 bps at June 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 June 30, 2013. The PPFRC also obtained data from certain actuarial consulting firms on actual group annuity purchases during the second quarter of 2013. The hypothetical quotations on June 30, 2013, may be summarized as follows:

AVERAGE OF THE THREE MOST COMPETITIVE QUOTES (USING UP94 GENERATIONAL MORTALITY TABLES)			
	Low duration	Medium duration	High duration
Discount rate	3.23%	3.43%	3.56%
Spread over CANSIM V39062	+ 39 bps	+ 59 bps	+ 72 bps

The data obtained on actual annuity purchases during the second quarter were consistent with the above results.

Guidance for Non-indexed Pensions

As a result of this analysis, the PPFRC has concluded that effective June 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 3.44% (CANSIM V39062 plus 60 bps at June 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 3.44% discount rate	Spread above unadjusted CANSIM V39062
Low duration	7.8	+ 40 bps
Medium duration	10.2	+ 60 bps
High duration	12.5	+ 70 bps

If the duration of the portion of the liabilities assumed to be settled through the purchase of annuities is lower than 7.8 or higher than 12.5, the actuary would make a reasonable assumption regarding the appropriate spread.

The PPFRC believes that groups with durations higher than 12.5 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 7.8. Therefore, as of June 30, 2013, the PPFRC believes that one reasonable approach would be to assume that the spread for durations lower than 7.8 is 40 bps, and the spread for durations higher than 12.5 is 70 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 and after June 30, 2013, pending any further guidance or other evidence of change in annuity pricing.

Example

As at June 30, 2013, the unadjusted CANSIM V39062 was 2.84%; therefore the guidance for the medium duration would be 3.44% (i.e., + 60 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 3.44% to 3.41%, the appropriate spread above the unadjusted CANSIM V39062 would be determined as:

$$\frac{[\text{Medium spread} \times (\text{High duration} - 11) + \text{High spread} \times (11 - \text{Medium duration})]}{[\text{High duration} - \text{Medium duration}]}$$

$$[60 \text{ bps} \times (12.5 - 11) + 70 \text{ bps} \times (11 - 10.2)] / [12.5 - 10.2] = 63 \text{ bps}$$

Prior to rounding, an applicable underlying discount rate would then be determined as 2.84% + 0.63% = 3.47%.

CPI-INDEXED ANNUITY PROXY

Previous Guidance

The previous guidance determined that an acceptable discount rate for estimating the cost of purchasing a group annuity where pensions are fully indexed to the rate of change in the CPI would be determined as the unadjusted yield on Government of Canada (GoC) real-return long-

term bonds (CANSIM series V39057), in conjunction with the UP94 generational mortality tables (based on the AA scale).

Given the lack of actual CPI-indexed annuity transactions, the above guidance was based on similar guidance issued by the PPFRC in previous years.

Rationale for Extensive Review

Most of the contributing insurers have historically provided hypothetical quotes for the two illustrative blocks used to develop previous PPFRC guidance, determined as if the pensions were fully indexed to CPI increases. The hypothetical quotes for the previous illustrative blocks on a CPI-indexed basis have consistently been higher than the guidance provided by prior educational notes. At the same time, the PPFRC did not have any up-to-date information on significant actual purchases of fully CPI-indexed annuities, and therefore was unable to determine whether the hypothetical quotes were consistent with actual market conditions.

In light of the above, the PPFRC has conducted research on the CPI-indexed group annuity market over the last 18 months. This research included discussions with insurers, including confirmation of their willingness to transact on the basis of the hypothetical quotes being provided as well as a review of the results received in a limited number of actual quotations for CPI-indexed annuities where the transaction did not proceed. The PPFRC is also aware that a significant CPI-indexed group annuity purchase occurred in the second quarter of 2013.

Analysis

While the data regarding actual annuity transactions indexed to the CPI continue to be extremely limited, the pricing data received in the potential transactions that did not proceed were broadly consistent with the hypothetical quotes being provided by the insurers. Consequently, the PPFRC has concluded, based on the limited evidence available, that the previous guidance is no longer appropriate for estimating the cost of annuities that are fully indexed to the rate of change in the CPI.

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

AVERAGE OF THE THREE MOST COMPETITIVE QUOTES (USING UP94 GENERATIONAL MORTALITY TABLES)	
Discount rate	-0.15%
Spread over CANSIM V39057	-120 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 above guidance is applicable to CPI-indexed annuities regardless of their duration.

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

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 120 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 June 30, 2013, pending any further guidance or other evidence of change in annuity pricing.

Example

As at June 30, 2013, the unadjusted yield on Government of Canada real-return long-term bonds (CANSIM series V39057) was 1.05%. Therefore, prior to rounding, an applicable underlying discount rate would then be determined as $1.05\% - 1.20\% = -0.15\%$.

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 memo.

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:

$$(\text{Indexation \%}) \cdot \text{Fully-indexed proxy} + (1 - \text{Indexation \%}) \cdot \text{Non-indexed proxy}$$

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 June 30, 2013, would be determined as $75\% \cdot (-0.15\%) + (1 - 75\%) \cdot 3.47\% = 0.755\%$.

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 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 June 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 June 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 spread.

The CIA has also published the final version of the [educational note](#) on alternative settlement methods for hypothetical wind-up and solvency valuations.

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.