Canadian Institute of Actuaries
Institut canadien des actuaires

Educational Note Supplement

Guidance for Assumptions for Hypothetical Wind-Up and Solvency Valuations Update – Effective September 30, 2015, and Applicable to Valuations with Effective Dates Between September 30, 2015, and December 30, 2015

Document 215097

Canadian Institute of Actuaries / Institut canadien des actuaires

MEMORANDUM

To: All Pension Actuaries

From: Pierre Dionne, Chair
Practice Council

Simon Nelson, Chair
Committee on Pension Plan Financial Reporting

Date: November 3, 2015

Subject: **Educational Note Supplement: Guidance for Assumptions for Hypothetical Wind-Up and Solvency Valuations Update – Effective September 30, 2015, and Applicable to Valuations with Effective Dates Between September 30, 2015, and December 30, 2015**

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The most recent guidance from the Committee on Pension Plan Financial Reporting (PPFRC) regarding assumptions for hypothetical wind-up and solvency valuations was provided in the educational note dated August 4, 2015. This guidance applied for valuations with effective dates on and after June 30, 2015 (but no later than December 30, 2015).

The PPFRC has conducted its quarterly review of group annuity pricing conditions as at September 30, 2015 and has determined that a revision to its previous guidance regarding assumptions for hypothetical wind-up and solvency valuations is appropriate for valuations with effective dates on or after September 30, 2015 (but no later than December 30, 2015).

The PPFRC has adopted the 2014 Canadian Pensioners' Mortality Table (CPM2014) combined with the mortality improvement scale CPM Improvement Scale B (CPM-B) as the underlying mortality table for purposes of developing the guidance (i.e., the same table promulgated by the Actuarial Standards Board for the purpose of subsection 3530 of the Standards of Practice). The PPFRC has also provided additional guidance on adjustments that the actuary would be expected to make to the regular annuity purchase assumptions for plans where there is demonstrated substandard or super-standard mortality or where an insurer might be expected to assume significantly shorter or longer than average pension plan longevity.

The revisions to the guidance are contained in this educational note supplement.

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Due Process

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

Contact Information

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PD, SN

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, 2015 (but no later than December 30, 2015), 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 or decreased arithmetically by between -20 to 60 basis points (bps), in conjunction with the UP94 generational mortality table, with the AA improvement scale (UP94Proj). The spread above or below 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 hypothetical quotes provided by seven insurance companies on illustrative blocks of business using pricing conditions as at June 30, 2015, supplemented by data from certain actuarial consulting firms on actual group annuity purchases during the second quarter of 2015. 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 as at September 30, 2015 from seven insurance companies on the same illustrative blocks of business used to develop the previous guidance. The characteristics of the three illustrative blocks are as follows:

Duration	**Low**	**Medium**	**High**
Duration at September 30, 2015	8.4	11.0	13.4
Approximate premium at September 30, 2015	$18 million	$24 million	$25 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:

[(Estimated Purchase Price at 3.19% / Estimated Purchase Price at 3.20%) – 1] / 0.01%

where 3.19% is equal to the CANSIM V39062 yield of 2.09% at September 30, 2015 plus 110 bps and where the estimated purchase price is calculated using mortality rates equal to the 2014 Canadian Pensioners' Mortality Table (CPM2014) combined with mortality improvement scale CPM Improvement Scale B (CPM-B) with no adjustments for sub or super-standard mortality (CPM2014Proj), being the guidance for the illustrative block with medium duration (as described below). Note that the durations of the three illustrative blocks will change over time as discount rates change.

The PPFRC also obtained data from certain actuarial consulting firms on actual group annuity purchases during the third quarter of 2015.

The hypothetical quotations at June 30, 2015 and September 30, 2015 may be summarized as follows:

Average of the Three Most Competitive Hypothetical Quotes									
	June 30, 2015 (Using UP94Proj)			September 30, 2015 (Using UP94Proj)			September 30, 2015 (Using CPM2014Proj)		
	Low duration	Medium duration	High duration	Low duration	Medium duration	High duration	Low duration	Medium duration	High duration
Discount rate	1.93%	2.46%	2.78%	1.86%	2.42%	2.79%	2.81%	3.05%	3.22%
Spread over CANSIM V39062	- 28 bps	+ 25 bps	+ 57 bps	- 23 bps	+ 33 bps	+ 70 bps	+ 72 bps	+ 96 bps	+ 113 bps

The change in spread over CANSIM V39062 based on the average of the three most competitive hypothetical quotes during the quarter was due primarily to the change in the underlying mortality rates used; changes in market conditions had a much lower impact. As of September 30, 2015 the variability between the most competitive hypothetical quotes was fairly small, though the most competitive quotes were somewhat more favourable than indicated above . In addition, while the average spreads for actual purchases and bona fide quotations during the quarter were not inconsistent with the averages quoted above for each block, actual purchases on blocks at certain durations were somewhat more favourable than the averages quoted above.

Based on the above information, the PPFRC has concluded that a revision to the guidance is appropriate. In establishing the guidance, the PPFRC has given some weight to the hypothetical quotes and the data collected on actual annuity purchases.

Guidance for Non-indexed Pensions

The PPFRC has concluded that effective September 30, 2015, the cost of purchasing non-indexed annuities, prior to any adjustment for sub or super-standard mortality, would be estimated based on the following process:

1. Determine the duration *of the portion of the liabilities assumed to be settled through the purchase of annuities*, based on a discount rate of 3.19% (CANSIM V39062 plus 110 bps at September 30, 2015) and CPM2014Proj mortality rates.
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 3.19% discount rate	Spread above unadjusted CANSIM V39062
Low duration	8.4	+ 80 bps
Medium duration	11.0	+ 110 bps
High duration	13.4	+ 120 bps

If the duration of the portion of the liabilities assumed to be settled through the purchase of annuities is lower than 8.4 or higher than 13.4, the actuary would make a reasonable assumption regarding the appropriate spread.

The PPFRC believes that groups with durations higher than 13.4 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 8.4. As of September 30, 2015, the PPFRC believes that one reasonable approach would be to assume that the spread for durations lower than 8.4 is +80 bps, and the spread for durations higher than 13.4 is +120 bps. Other approaches may also be reasonable.

3. The cost of purchasing annuities would be estimated using an interest rate determined as the unadjusted CANSIM V39062 increased arithmetically by the spread calculated in step 2, in conjunction with CPM2014Proj.

   Each actuary would use discretion in determining whether to round the interest rate to the nearest five or 10 basis points. Consistency in the application of such rounding would be followed.

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 September 30, 2015, pending any further guidance or other evidence of change in annuity pricing.

CPI-Indexed Annuity Proxy

Previous Guidance

The most recent guidance from the PPFRC concluded that for valuations with effective dates on or after June 30, 2015 (but no later than December 30, 2015), 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 UP94Proj.

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

Analysis

The majority of the contributing insurers also provided hypothetical quotes for the illustrative blocks on a CPI-indexed basis as of September 30, 2015. The hypothetical quotations as at June 30, 2015 and September 30, 2015, for the medium-duration illustrative block may be summarized as follows:

Average of the Three Most Competitive Hypothetical Quotes			
	June 30, 2015 (Using UP94Proj)	**Sept. 30, 2015 (Using UP94Proj)**	**Sept. 30, 2015 (Using CPM2014Proj)**
Discount rate	-0.60%	-0.59%	+0.05%
Spread over CANSIM V39057	- 115 bps	-128 bps	- 64 bps

The spread below CANSIM V39057 based on the average of the three most competitive hypothetical quotes decreased slightly for the medium-duration illustrative block.

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 very limited quantitative data obtained on actual fully indexed annuity purchases during the third quarter of 2015.

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 determined using an interest rate equal to the unadjusted yield on Government of Canada real-return long-term bonds (CANSIM series V39057) reduced arithmetically by 70 bps, in conjunction with CPM2014Proj.

Each actuary would use discretion in determining whether to round the interest rate to the nearest five or 10 basis points. Consistency in the application of such rounding would be followed.

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, 2015, pending any further guidance or other evidence of change in annuity pricing.

Example

As at September 30, 2015, the unadjusted yield on Government of Canada real-return long-term bonds (CANSIM series V39057) was 0.69%. Therefore, prior to rounding, an applicable underlying discount rate would be determined as 0.69% - 0.70% = -0.01%.

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 April 24, 2015, modified to reflect the revised guidance contained in this memo.

Mortality Basis

The PPFRC does not have access to the mortality assumptions used by insurers for purposes of pricing group annuities. The mortality table and assumed future improvements used to establish the discount rate guidance in this educational note are the 2014 Combined Canadian Pensioners' Mortality Table (CPM2014) generational mortality tables in conjunction with the CPM Improvement Scale B (CPM-B), irrespective of the basis used by insurers when submitting quotes. This is the mortality table promulgated for the computation of pension commuted values for calculations from October 1, 2015 in accordance with subsection 3530 of the Standards of Practice. Previous guidance was issued using the UP94 generational mortality table in conjunction with the AA improvement scale.

The choice of the mortality assumption used for this guidance is unlikely to materially affect the estimated cost of purchasing an annuity, since the guidance is derived by solving for the discount rate that along with the selected mortality table produces the price of an annuity. It would be acceptable to continue to use the UP94 generational mortality table, particularly for valuations on September 30, 2015, if a lower discount rate is used and produces an annuity purchase liability that is consistent with this guidance. The reduction in discount rate will vary with the demographic and liability profile of the group.

Mortality Adjustments

The hypothetical quotes were requested to be based on an assumption that the priced group's life expectancy is typical of a group annuity purchase. The hypothetical quotes were also requested to be based on typical pension sizes, irrespective of the underlying data. That is, no adjustments for sub or super-standard mortality were to be made due to the size of the pensions, or other factors, in the illustrative block.

Insurers are increasingly considering occupational and demographic factors in establishing mortality assumptions for the pricing basis of specific group annuities, as are pension actuaries for establishing liabilities for other purposes, including going concern valuations. The factors an insurer may consider are similar to those pension actuaries consider in establishing liabilities, such as the credibility of experience, the experience of similar plans, published mortality studies, plan provisions that expose the group to anti-selection or tail risk, and possible adjustments based on characteristics such as collar type, industry, and pension size.

An adjustment to regular annuity purchase assumptions would be expected where there is demonstrated substandard or super-standard mortality or where an insurer might be expected to assume significantly shorter or longer than average pension plan longevity based on the above factors. In such cases, the actuary would be expected to make an adjustment to the mortality assumption in a manner consistent with the underlying annuity purchase basis.

Adjustment could include using a different underlying mortality table, developing a broad adjustment to the underlying mortality table (e.g., 90% or 110% of the standard table rates) or, in some cases, different adjustment factors may be used for a range of ages. Other approaches for making an adjustment may also be reasonable.

Further guidance on the nature of adjustments for plan characteristics can be found in the March 2014 Educational Note *Selection of Mortality Assumptions for Pension Plan Actuarial Valuations*.

Validity of April 24, 2015 Educational Note

Except as noted above, actuaries would continue to reference the April 24, 2015 educational note for guidance with respect to the selection of assumptions for hypothetical wind-up and solvency valuations with effective dates between September 30, 2015, and December 30, 2015.

Actual Annuity Pricing

The purpose of this educational note supplement is to provide actuaries with guidance related to establishing assumptions for hypothetical wind-up and solvency valuations. 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 and the factors outlined in the section titled "Mortality Adjustments", some of the other factors that may affect pricing of a particular purchase include, but are not limited to the following:

- The overall size of the purchase;
- The proportion of deferred vested members included in the group being purchased;
- Broad capital market conditions at the time of 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, 2015, 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, 2015, up to December 30, 2015, pending any future guidance or other evidence of change in annuity pricing.

As part of this quarterly review, the PPFRC requested information from insurers as to whether an illustrative block of business that is half the size or five times the size, but keeping the same average pension and profile as the current illustrative block, would have a significant impact on price. Based on the information collected, the PPFRC does not currently believe that the guidance should be revised to reflect differing pricing for these blocks.

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.