

## ***Explanatory Report***

# **Guidance for Assumptions for Hypothetical Wind-Up and Solvency Valuations Update – Effective September 30, 2022, and Applicable to Valuations with Effective Dates on or after September 30 30, 2022, and no later than December 30, 2022**

## **Committee on Pension Plan Financial Reporting**

**November 2022**

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*The actuary should be familiar with relevant other guidance. They expand or update the guidance provided in an educational note. They do not constitute standards of practice and are, therefore, not binding. They are, however, intended to illustrate the application of the Standards of Practice, so there should be no conflict between them. The actuary should note however that a practice that the other guidance 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. Responsibility for the manner of application of standards of practice in specific circumstances remains that of the members. As standards of practice evolve, other guidance may not reference the most current version of the Standards of Practice; and as such, the actuary should cross-reference with current Standards. To assist the actuary, the CIA website contains an up-to-date reference document of impending changes to update other guidance.*

# MEMORANDUM

**To:** All pension actuaries

**From:** Dean Newell, Chair  
Actuarial Guidance Council  
Gus van Helden, Chair  
Committee on Pension Plan Financial Reporting

**Date:** November 7, 2022

**Subject:** **Explanatory Report: Guidance for Assumptions for Hypothetical Wind-Up and Solvency Valuations Update – Effective September 30, 2022, and Applicable to Valuations with Effective Dates on or after September 30, 2022, and no later than December 30, 2022**

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The Committee on Pension Plan Financial Reporting (PPFRC) is issuing this explanatory report to provide members with additional information and details on the analysis done for the guidance outlined in the [educational note supplement](#) dated October 25, 2022 (*Guidance for Assumptions for Hypothetical Wind-Up and Solvency Valuations Update – Effective September 30, 2022, and Applicable to Valuations with Effective Dates on or after September 30, 2022, and no later than December 30, 2022*), issued as a supplement to the [educational note](#) dated March 11, 2022.

## Contact information

Questions or comments regarding this explanatory report may be directed to the PPFRC Chair at [guidance.feedback@cia-ica.ca](mailto:guidance.feedback@cia-ica.ca).

DN, GVH

## Application of the March 11, 2022, educational note

The guidance from the PPFRC, outlined in the March 11, 2022 educational note, concluded that for valuations with effective dates on or after December 31, 2021 (but no later than December 30, 2022), 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 a spread determined based on the duration of the liabilities. 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), the discount rate would be determined as the unadjusted yield on GoC real-return long-term bonds (CANSIM series V39057) increased arithmetically by a fixed spread. The discount rates are to be used in conjunction with the 2014 Canadian Pensioners' Mortality Table (CPM2014) combined with mortality improvement scale CPM Improvement Scale B (CPM-B). If applicable, the mortality assumption would be adjusted to reflect adjustments for sub- or super-standard mortality. The guidance outlined in the March 11, 2022 educational note was based on hypothetical quotes provided by insurance companies on illustrative blocks of business, supplemented by data from certain actuarial consulting firms on actual group annuity purchases and bona fide quotations.

Except as noted below, actuaries would continue to reference the March 11, 2022, educational note for guidance with respect to the selection of assumptions for hypothetical wind-up and solvency valuations with effective dates on or after September 30, 2022, and no later than December 30, 2022.

## Guidance for non-indexed pensions

Based on the analysis provided in Appendix A, the PPFRC concluded that, effective September 30, 2022, the cost of purchasing non-indexed annuities would be estimated based on the process outlined in the March 11, 2022, educational note and the following table:

<b>Annuity duration</b>	<b>Duration based on 4.64% discount rate</b>	<b>Unadjusted CANSIM V39062* as at September 29, 2022**</b>	<b>Spread above V39062</b>	<b>Discount rate as at September 30, 2022</b>
<b>Low</b>	7.8	3.14%	+140 bps	4.54%
<b>Medium</b>	9.9	3.14%	+150 bps	4.64%
<b>High</b>	11.9	3.14%	+150 bps	4.64%
<b>Mortality table:</b> CPM2014 combined with mortality improvement scale CPM-B with no adjustments for sub- or super-standard mortality.				

\*Unadjusted average yield on GoC marketable bonds with maturities over 10 years (CANSIM V39062)

\*\*September 30, 2022 was a Bank Holiday

## Other guidance for non-indexed pensions

### *Very low duration annuities*

As at September 30, 2022, the PPFRC continues to believe that a reasonable approach to derive the spread for very low duration annuities is to extrapolate downwards from the spreads at the low and medium durations. Other approaches may also be reasonable.

### *Very high duration annuities*

As at September 30, 2022, the PPFRC continues to believe that a reasonable approach to derive the spread for very high duration annuities is to extrapolate downwards from the spread at the high duration, assuming that the rate of decrease in spreads from the high duration will be the same as the rate of increase in spreads from the low duration to the high duration. Other approaches may also be reasonable.

## Guidance for indexed pensions

Based on the analysis provided in Appendix A, the PPFRC concluded that, effective September 30, 2022, the cost of purchasing a group annuity where pensions are fully indexed to the rate of change in the CPI would be estimated based on the process outlined in the March 11, 2022 educational note and the following table:

<b>Unadjusted CANSIM V39057* as at September 29, 2022**</b>	<b>Spread below V39057</b>	<b>Discount rate as at September 30, 2022</b>
1.44%	- 40 bps***	1.04%
<b>Mortality table:</b> CPM2014 combined with mortality improvement scale CPM-B with no adjustments for sub- or super-standard mortality.		

\*Unadjusted yield on GoC real-return long-term bonds (CANSIM V39057)

\*\*September 30, 2022 was a Bank Holiday

\*\*\*See note in Appendix A for 'Clarification Regarding Indexed Pensions'

## Actual annuity pricing

The purpose of this explanatory report 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, as outlined in the March 11, 2022, educational note, with the result that the actual price may differ from the guidance provided herein. Spreads versus GoC long-term bonds for group annuity pricing can be volatile, of which actuaries may wish to be mindful when communicating advice related to future hypothetical wind-up and solvency valuations.

## Large plans

The PPFRC believes that the liability thresholds where a plan may have difficulty in effecting a single annuity purchase to settle its liabilities described in the [educational note supplement](#) issued on July 26, 2022 remain appropriate:

	<b>Non-indexed annuities</b>	<b>Indexed annuities</b>
June 30, 2022 onward	\$1,250 million	\$300 million
June 30, 2021 to June 29, 2022	\$1,000 million	\$300 million
December 31, 2018 to June 29, 2021	\$750 million	\$250 million
September 2013 to December 30, 2018	\$500 million	\$200 million

**Additional comments**

The PPFRC intends to continue monitoring group annuity pricing on a quarterly basis. Actuaries may use the spreads indicated above for non-indexed and indexed pensions effective September 30, 2022, for valuations with effective dates on and after September 30, 2022, and no later than December 30, 2022, pending any future guidance or other evidence of change in annuity pricing.

## Appendix A – Methodology in developing guidance as at September 30, 2022

### Data

The PPFRC requested hypothetical quotes as at September 30, 2022, from the same insurance companies on the same illustrative blocks of business used to develop the December 31, 2021 guidance outlined in the March 11, 2022 educational note. Consistent with the analysis performed at previous quarter ends, the hypothetical quote information was supplemented with data on the pricing of actual group annuity purchases and bona fide quotations in cases where the transaction did not proceed during the third quarter of 2022, as provided by several actuarial consulting firms. The total volume of data collected during the third quarter of 2022 for buyout and buy-in group annuity purchases in Canada was approximately \$0.8B. There was limited quantitative data obtained on actual indexed annuity purchases or bona fide quotations in cases where the transaction did not proceed during the third quarter of 2022.

### Mortality basis

The assumed mortality table and assumed future mortality improvements used to establish the discount rate guidance in this explanatory report are the CPM2014 combined with mortality improvement scale CPM-B with no mortality adjustments, irrespective of the basis used by insurers when submitting quotes.

### Analysis – non-indexed annuities

In establishing the guidance, the PPFRC has given weight to the hypothetical quotes and to the data collected on actual annuity purchases and bona fide quotations. Summary data in respect of the three central non-indexed illustrative blocks is the same as the data shown in Appendix A of the March 11, 2022 educational note, with the exception of the durations. The durations of the three central illustrative blocks are as follows:

Duration	Low	Medium	High
Duration at September 30, 2022	7.8	9.9	11.9

For the purpose of this guidance, the durations of the illustrative blocks shown above were determined using the discount rate guidance for the illustrative block with medium duration (as described in this explanatory report) of 4.64% which is equal to the CANSIM V39062 yield of 3.14% at September 29, 2022, plus 150 bps. The mortality assumptions as outlined in the March 11, 2022, educational note were also used. Note that the durations of the three illustrative blocks will change over time as discount rates change.

The table below provides the implicit discount rates as at September 30, 2022, underlying the average of the three most competitive hypothetical quotes, determined in conjunction with CPM2014 combined with mortality improvement scale CPM-B with no mortality adjustments, and the spread of these implicit discount rates over the CANSIM V39062 yield. Comparable information is also shown as at June 30, 2022.

<b>Average of the three most competitive hypothetical quotes</b>			
<b>Duration</b>	<b>Low</b>	<b>Medium</b>	<b>High</b>
<i>September 30, 2022</i>			
<b>Discount rate</b>	4.55%	4.61%	4.62
<b>Spread over CANSIM V39062</b>	+ 141 bps	+ 147 bps	+ 148 bps
<i>June 30, 2022</i>			
<b>Discount rate</b>	4.51%	4.63%	4.67%
<b>Spread over CANSIM V39062</b>	+ 132 bps	+ 144 bps	+ 148 bps

The spread over CANSIM V39062 based on the average of the three most competitive hypothetical quotes increased for the low duration illustrative block and remained stable for the medium and high duration illustrative blocks from June 30, 2022.

#### **Analysis – fully CPI-indexed annuities**

A subset of the contributing insurers also provided hypothetical quotes for the illustrative blocks on a CPI-indexed basis as of September 30, 2022, of which at least two indicated they may be willing to transact on their hypothetical quotes at the three durations.

Information on pricing was considered from the insurers willing to transact. To ensure confidentiality, the information for this explanatory report has been suppressed:

<b>Average of the most competitive hypothetical quotes</b>			
	<b>Number of hypothetical quotes in the average</b>	<b>Discount rate</b>	<b>Spread over CANSIM V39057</b>
<b>September 30, 2022</b>	--	--	-- *
<b>June 30, 2022</b>	3	0.41%	- 95 bps

Based on the average of the most competitive hypothetical quotes, the absolute value of the spreads relative to the unadjusted yield on GoC real-return long-term bonds (CANSIM V39057) for the medium-duration illustrative block decreased from June 30, 2022.

#### **\* Clarification Regarding Indexed Pensions**

Given the current economic conditions, the PPFRC reached out to the insurance companies that provide quotes on the illustrative blocks of business to ensure that their pricing reflects a first pension increase for cost-of-living adjustments 12 months from the quotation date (i.e., pricing is not affected by actual inflation experience prior to the quotation date). The actuary would consider whether any adjustment to the guidance provided is warranted based on the specific circumstances of a particular pension plan, including the timing of cost-of-living adjustments and actual inflation experience.

## Appendix B – Summary and links for historical guidance

The following is a summary of the historical guidance issued by the PFFRC. The summary is provided for reference, and actuaries are directed to refer to the respective published educational note or educational note supplement.

Educational note/ supplement/ explanatory report	Mortality table	Non-indexed immediate and deferred <i>Duration: Spread relative to unadjusted CANSIM V39062</i>			Fully CPI-indexed <i>Spread relative to unadjusted CANSIM V39057</i>
		Low duration	Medium duration	High duration	All durations
Sep 30, 2022	CPM2014Proj	7.8: + 140 bps	9.9: + 150 bps	11.9: + 150 bps	- 40 bps
<a href="#">Jun 30, 2022</a>	CPM2014Proj	7.8: + 130 bps	9.9: + 150 bps	11.9: + 150 bps	- 60 bps
<a href="#">Mar 31, 2022</a>	CPM2014Proj	8.2: + 120 bps	10.5: + 140 bps	12.8: + 140 bps	- 40 bps
<a href="#">Dec 31, 2021</a>	CPM2014Proj	8.7: + 100 bps	11.3: + 120 bps	13.9: + 120 bps	- 40 bps
<a href="#">Sep 30, 2021</a>	CPM2014Proj	8.6: + 100 bps	11.1: + 120 bps	13.6: + 130 bps	- 50 bps
<a href="#">Jun 30, 2021</a>	CPM2014Proj	8.6: + 100 bps	11.2: + 120 bps	13.7: + 130 bps	- 50 bps
<a href="#">Mar 31, 2021</a>	CPM2014Proj	8.5: + 100 bps	11.1: + 120 bps	13.6: + 130 bps	- 50 bps
<a href="#">Dec 31, 2020</a>	CPM2014Proj	8.9: + 120 bps	11.6: + 140 bps	14.3: + 150 bps	- 50 bps
<a href="#">Sep 30, 2020</a>	CPM2014Proj	8.9: + 130 bps	11.6: + 150 bps	14.3: + 160 bps	- 50 bps
<a href="#">Jun 30, 2020</a>	CPM2014Proj	8.8: + 140 bps	11.6: + 160 bps	14.3: + 170 bps	- 50 bps
<a href="#">Apr 30, 2020</a>	CPM2014Proj	8.9: + 130 bps	11.7: + 140 bps	14.5: + 150 bps	- 70 bps
<a href="#">Mar 31, 2020</a>	CPM2014Proj	8.7: + 150 bps	11.4: + 160 bps	13.9: + 170 bps	- 70 bps
<a href="#">Dec 31, 2019</a>	CPM2014Proj	8.6: + 110 bps	11.2: + 120 bps	13.7: + 120 bps	- 70 bps
<a href="#">Sep 30, 2019</a>	CPM2014Proj	8.7: + 120 bps	11.3: + 130 bps	13.9: + 130 bps	- 70 bps
<a href="#">Jun 30, 2019</a>	CPM2014Proj	8.7: + 100 bps	11.4: + 110 bps	14.0: + 110 bps	- 70 bps
<a href="#">Mar 31, 2019</a>	CPM2014Proj	8.6: + 100 bps	11.2: + 110 bps	13.8: + 110 bps	- 70 bps
<a href="#">Dec 31, 2018</a>	CPM2014Proj	8.5: + 100 bps	11.0: + 110 bps	13.4: + 110 bps	- 70 bps
<a href="#">Sep 30, 2018</a>	CPM2014Proj	8.4: + 80 bps	10.9: + 90 bps	13.3: + 90 bps	- 80 bps
<a href="#">Jun 30, 2018</a>	CPM2014Proj	8.5: + 80 bps	11.1: + 90 bps	13.5: + 90 bps	- 70 bps
<a href="#">Mar 31, 2018</a>	CPM2014Proj	8.5: + 70 bps	11.1: + 80 bps	13.6: + 90 bps	- 70 bps
<a href="#">Dec 31, 2017</a>	CPM2014Proj	8.6: + 70 bps	11.1: + 80 bps	13.6: + 90 bps	- 70 bps
<a href="#">Sep 30, 2017</a>	CPM2014Proj	8.5: + 60 bps	11.1: + 70 bps	13.5: + 80 bps	- 70 bps
<a href="#">Jun 30, 2017</a>	CPM2014Proj	8.6: + 60 bps	11.2: + 80 bps	13.8: + 90 bps	- 70 bps
<a href="#">Mar 31, 2017</a>	CPM2014Proj	8.5: + 70 bps	11.0: + 100 bps	13.5: + 110 bps	- 60 bps
<a href="#">Dec 31, 2016</a>	CPM2014Proj	8.5: + 70 bps	11.0: + 90 bps	13.5: + 100 bps	- 60 bps
<a href="#">Sep 30, 2016</a>	CPM2014Proj	8.7: + 80 bps	11.4: + 110 bps	14.0: + 120 bps	- 70 bps
<a href="#">Jun 30, 2016</a>	CPM2014Proj	8.6: + 90 bps	11.3: + 120 bps	13.8: + 130 bps	- 70 bps
<a href="#">Mar 31, 2016</a>	CPM2014Proj	8.5: + 90 bps	11.1: + 120 bps	13.6: + 130 bps	- 70 bps
<a href="#">Dec 31, 2015</a>	CPM2014Proj	8.5: + 60 bps	11.1: + 100 bps	13.6: + 110 bps	- 70 bps
<a href="#">Sep 30, 2015</a>	CPM2014Proj	8.4: + 80 bps	11.0: + 110 bps	13.4: + 120 bps	- 70 bps
<a href="#">Jun 30, 2015</a>	UP94Proj	8.3: - 20 bps	10.9: + 30 bps	13.6: + 60 bps	- 120 bps
<a href="#">Mar 31, 2015</a>	UP94Proj	8.5: + 0 bps	11.3: + 30 bps	14.0: + 60 bps	- 120 bps
<a href="#">Dec 31, 2014</a>	UP94Proj	8.2: + 0 bps	10.9: + 30 bps	13.5: + 60 bps	- 120 bps
<a href="#">Sep 30, 2014</a>	UP94Proj	8.1: + 0 bps	10.6: + 30 bps	13.2: + 50 bps	- 120 bps
<a href="#">Jun 30, 2014</a>	UP94Proj	8.0: + 0 bps	10.5: + 40 bps	12.9: + 60 bps	- 110 bps