Canadian Institute of Actuaries | Institut canadien des actuaires

Update to Draft Educational Notes

Changes to the Reference Curves Outlined in CLIFR's and PCFRC's Draft Educational Notes on IFRS 17 Discount Rates

Document 221075

This document updated document 220079
and was replaced by document 222097

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Changes to the Reference Curves Outlined in CLIFR's and PCFRC's Draft Educational Notes on IFRS 17 Discount Rates

Committee on Life Insurance Financial Reporting

Committee on Property and Casualty Insurance Financial Reporting

June 2021

Document 221075

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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: Members in the life insurance, property and casualty insurance, and public personal injury compensation plan areas

From: Steven W. Easson, Chair
Actuarial Guidance Council

Marie-Andrée Boucher and Steve Bocking, Co-Chairs
Committee on Life Insurance Financial Reporting

Sarah Chevalier, Chair
Committee on Property and Casualty Insurance Financial Reporting

Date: June 30, 2021

Subject: **Update to draft educational notes: Changes to the reference curves outlined in CLIFR's and PCFRC's draft educational notes on IFRS 17 Discount Rates**

Introduction

The Actuarial Guidance Council (AGC), with the support of the Committee on Life Insurance Financial Reporting (CLIFR) and in collaboration with the Committee on Property and Casualty Insurance Financial Reporting (PCFRC), initiated an external consultation on the draft educational note, *IFRS 17 Discount Rates for Life and Health Insurance Contracts* ("CLIFR's draft educational note") in the fall of 2020. CLIFR and its IFRS 17 Discount Rate subcommittee ("subcommittee") have reviewed the comments received as part of the external consultation process. This consultation process and review of the comments received resulted in the subcommittee recommending changes to the reference curves outlined in Chapter 2 of CLIFR's draft educational note. The purpose of this memorandum is to provide a summary of the changes that are expected to be reflected in the final educational note later this year. The AGC, CLIFR, and PCFRC are releasing this summary of changes ahead of publishing their final educational notes and recommend that it be considered when completing the Office of the Superintendent of Financial Institutions (OSFI) and the Autorité des marchés financiers (AMF) Quantitative Impact Study #3 for Life Insurance Capital Adequacy Test (LICAT)/Capital Adequacy Requirements for Life Insurance (CARLI)/Minimum Capital Testing (MCT) that will be conducted in 2021.

In December 2020, PCFRC published a revised draft educational note, *IFRS 17 Discount Rates and Cash Flow Considerations for Property and Casualty Insurance Contracts*. Section 5 discusses the reference curves and refers to CLIFR's draft educational note for guidance on this topic.

The *Application of IFRS 17 Insurance Contracts to Public Personal Injury Compensation Plans* draft educational note published by the Committee on Workers' Compensation also refers to CLIFR's and PCFRC's draft educational notes on the topic of discount rates.

As such, this update to draft educational notes applies to members in the life insurance, property and casualty insurance, and public personal injury compensation plan areas.

A preliminary version of the document included in Appendix 1 was shared with the following committees:

- Property and Casualty Insurance Financial Reporting Committee
- Committee on Risk Management and Capital Requirements
- Committee on the Appointed/Valuation Actuary
- International Insurance Accounting Committee
- Workers' Compensation Committee

CLIFR and PCFRC are satisfied it has sufficiently addressed the comments received.

The creation of this update to draft educational notes has followed the ASC's protocol for the adoption of educational notes and other material. In accordance with the Institute's *Policy on Due Process for the Approval of Guidance Material other than Standards of Practice and Research Documents*, this update to draft educational notes has been prepared by CLIFR and PCFRC and has received approval for distribution from the ASC on June 23, 2021.

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.

CLIFR and PCFRC would like to acknowledge the contribution of the subcommittee that assisted in the development of this update to draft educational notes: Stéphanie Fadous (Chair), Wesley Foerster, Emmanuel Hamel, Étienne Morin, Denis Cantin, Saul Gercowsky, Benoît-Pierre Blais, Gwen Yun Weng, Ivy Lee, Junyu Chen, Shaonan Fang, Matthew Garnier, Abid Kazmi, Amal Rajwani, and Ling Cen.

Questions or comments regarding this update to draft educational note may be directed to Marie-Andrée Boucher, Steve Bocking, and Sarah Chevalier.

SWE, MAB, SB, SC

Background

The language related to discount rates in the IFRS 17 standard is brief and principles-based. The principles-based nature of IFRS 17 could lead to a wide range of practice among actuaries, particularly when setting discount rates beyond the observable period. Consequently, CLIFR has created parameters for a set of reference curves to facilitate comparison of discount rates among entities. PCFRC's revised draft educational note, *IFRS 17 Discount Rates and Cash Flow Considerations for Property and Casulaty Insurance Contracts* refers to CLIFR's reference curves.

It is expected that the actuary compares the entity's discount curves used to calculate the discounted value of the estimates of future cash flows against these reference curves in the Appointed Actuary's Report (AAR) to the regulator. The information provided in the AAR would include a demonstration that the discounted value of the estimates of future cash flows calculated using the parameters of the entity's discount curves beyond the observable period is not lower than the value obtained using the parameters of the reference curves beyond the observable period (refer to the draft educational note for more information).

Chapter 2 of CLIFR's draft educational note and Section 5 of PCFRC's draft educational note present reference curves for insurance contracts that are deemed to be liquid and illiquid and outlines how these curves are constructed in the observable period and beyond the observable period.

The draft educational notes define reference curves for liquid and illiquid insurance contracts. In assessing the liquidity characteristics of the insurance contracts, an entity may have insurance contracts that fall between the two defined reference curves. For example, an entity may only have insurance contracts that have medium liquidity characteristics or may have different insurance contracts that fall in multiple liquidity categories. In these situations, the actuary would use judgment to derive the reference curve that would apply to the insurance contracts that fall between the defined liquid and illiquid categories.

External consulation and resulting changes

The comments received as part of the external consultation process and the resulting changes to the methodologies used to set the parameters of the reference curves, namely the ultimate risk-free rate[1], the ultimate liquidity premiums and the liquidity premiums within the observable period are outlined in the document included in Appendix 1 of this update to draft educational notes and summarized below.

Ultimate risk-free rate

CLIFR and its subcommittee determined that it would be appropriate to base the determination of the ultimate risk-free rate on a historical approach that puts more weight on recent data. This led to the recommendation that the ultimate risk-free rate be based on an exponential moving average formula, and that the ultimate risk-free rate be updated annually using this formula.

[1] The ultimate risk-free rate used within the reference curves is on a "spot rate basis". All references to the ultimate risk-free rate within this document refer to the parameter within the the reference curves and is on a "spot rate basis."

The reference curves' ultimate risk-free rate is set in consideration of the real interest rate and inflation target. Real interest rates consist of the short-term real rate and term premium. A 25-year exponential moving average (EMA) is used to place more weight on recent data both for the short-term real rate and term premium. The EMA formula used to calculate both the short-term real rate and term premium is as follows:

$$EMA(t) = Data(t) \times \alpha + EMA(t-1) \times (1 - \alpha)$$

Where **Data(t)** represents the most recent observation at time t; **α** = 2 / (N + 1) and **N** is equal to 300 months (i. e., α = 2/301).

The ultimate risk-free rate is then calculated as follows:

Reference curves' ultimate risk-free rate(t)

$$= EMA(t)_{\text{short-term real rate}} + EMA(t)_{\text{term premium}} + \text{inflation target}(t)$$

The recommendation for the inflation target (t) is to use the mid range of the Bank of Canada inflation target of 1% to 3% (i.e., inflation target (t) = 2%).

The reference curves' ultimate risk-free rate will be updated annually using this formula, but the maximum annual change will be capped at ±15 bps.

For the purposes of the upcoming 2021 OSFI and AMF Quantitative Impact Study #3 and for any LICAT/CARLI/MCT 2023 Test Runs, an ultimate risk-free rate of 3.65% was determined to be appropriate. This rate was derived using data up to March 2021 and projections of short-term real rates and term premiums to the end of calendar year 2022 under three scenarios (see Appendix 2).

In order to provide some stability/certainty during the transition in to IFRS 17, this rate is the recommended rate up to October 15, 2023. The next update to the ultimate risk-free rate will be effective on October 15, 2023, and will utilize actual data up to the end of 2022.

Ultimate liquidity premiums

No changes were made to the ultimate liquidity premiums. The ultimate liquidity premiums are determined using the simple average of historical long-term liquidity premiums as outlined in the document attached to this update to draft educational notes. Using the most recent data available this resulted in an ultimate liquidity premium of 1.5% for the most illiquid category of products and 0.7% for the most liquid category. Like the reference curves' ultimate risk-free rate, these reference curves ultimate liquidity premiums are recommended for use up to October 15, 2023. These ultimate liquidity premiums will then be updated using data to the end of 2022 and be effective on October 15, 2023, respectively.

Liquidity premiums in the observable period

To set the reference curves in the observable period the subcommittee calculated what the liquidity premiums would be across the observable curve based on historical data for spreads, expected credit losses, and unexpected credit losses. The subcommittee reviewed the details of the calculation and recommended a few changes for the illiquid reference curve, as outlined in the document attached in Appendix 1, that led to an increase in the credit default adjustment from 25% to 30%. In other words, the liquidity premium ratio for the illiquid reference curve will be updated from 75% to 70%.

Resulting reference curves

The reference curves outlined in CLIFR's and PCFRC's draft educational notes will be updated to reflect the changes discussed above. This would result in the following estimated reference curves as at December 31, 2022:

In the observable period:

- Liquid curve: Risk-free rate + 90% of Provincial Bonds Spreads
- Illiquid curve: Risk-free rate + 70% of Canadian Investment Grade Corporate Bonds Spreads[2] + 0.50%

In the unobservable period:

- Liquid curve: Grade linearly from the 30-year spot rate to the ultimate 70-year spot rate of 4.35% (ultimate risk-free rate of 3.65% and ultimate liquidity premium of 0.70%)
- Illiquid curve: Grade linearly from the 30-year spot rate to the ultimate 70-year spot rate of 5.15% (ultimate risk-free rate of 3.65% and ultimate liquidity premium of 1.50%)

Publishing the reference curves

The CIA has retained the services of Fiera Capital (Fiera) to publish the reference curves and market curves used to build the reference curves on a monthly basis. The market curves developed by Fiera include a Government of Canada curve (i.e., risk-free curve), a provincial bond market curve and a corporate bond market curve that uses 50% of a Corporate A-rated bond curve, and 50% of a Corporate BBB-rated bond curve. The resulting reference curves are published on Fiera's website.

[2] The subset of investment grade corporate bonds used for the calculation of the spreads were A or BBB rated. The corporate bond spreads were derived using 50% of the corporate A spreads and 50% of the corporate BBB spreads.

Appendix 1

The following document summarizes the comments received within the external consultation process and outlines the recommended updates to CLIFR's and PCFRC's draft educational notes.

IFRS 17 Discount rate draft educational note – External consultation process

Stéphanie Fadous, Étienne Morin, Gwen Weng

Agenda

- External consultation process review
- CLIFR Subcommittee's areas of focus
- Feedback on ultimate risk-free rate (URFR)
- Feedback on liquidity premium
- Timeline

Draft ed note overview

- Chapter 1: Considerations in developing the discount curve for IFRS 17 valuation
  - Setting the observable period in Canada
  - Setting the ultimate risk-free rate
  - Setting the liquidity premium for products sold in Canada
  - In addition to the guidance above:
    - Using spot rates versus forward rates
    - Methodology to extrapolate beyond the observable period
    - Period over which the last observable rate would converge to an ultimate rate
- Chapter 2: Reference curve for liquid and illiquid insurance contracts
  - Serves as a qualitative comparison point in the observable period
  - Serves as a benchmark in the unobservable period: *"When selecting the parameters in the unobservable period, the actuary would choose parameters that result in the discounted value of the estimates of future cash flows being as high as the discounted value of the estimates of future cashflows obtained using the reference curve parameters beyond the observable period. This comparison would be performed in aggregate for all insurance contracts sold in Canada in Canadian currency"*

Reference curve overview

In the observable period (30 years)

- Liquid curve: Risk-free rate + 90% of provincial bonds spread
- Illiquid curve: Risk-free rate + 75% of Canadian investment grade corporate bonds spread[1] + 0.50%

In the unobservable period (>30 years)

- Liquid curve: Grade linearly from the 30-year point to the ultimate 70-year spot rate of 4.7% (risk-free rate of 4% and 70bps liquidity premium)
- Illiquid curve: Grade linearly from the 30-year point to the ultimate 70-year spot rate of 5.5% (risk-free rate of 4% and 150bps liquidity premium)

Areas of focus from external comments

- Methodology used to set the ultimate risk-free rate of 4%
- Methodology used to set the liquidity premium in the observable and unobservable period
- Methodology and frequency of updating the parameters of the reference curves

External consultation process

Feedback requested from different commentors (i.e., key stakeholders and economists) on specific topics covered in the draft educational note (some were asked to comment on the entire note):	The derivation of the risk-free rates beyond the last observable point, including setting the ultimate risk-free rate;
	The establishment of the last observable point in Canada;
	The basis used to interpolate the rates between the last observable point and the ultimate rate;
	Establishing the liquidity premium in the observable and unobservable periods;
	Developing a process to update the value of the reference curve parameters.

Areas of focus

- Areas where we received the most feedback on were related to :
  - Setting the ultimate risk-free rate (URFR)
  - Setting the liquidity premium in the observable period and beyond the observable period
  - Developing a process to update the parameters of the reference curves

- On the topics of the last observable point, we received either no comments or concurrence with the 30-year horizon
- On the topics of interpolation between the last observable point and the ultimate rates, we received few comments, two reviewers pointed out the continuity of forwards rates, one considered the approach reasonable, and two believed there should be only one method of interpolation
- The subcommittee's review is therefore focused on the ultimate risk-free rate, the liquidity premium, and setting an approach to update the parameters of the reference curves

Ultimate risk-free rate (URFR)

Principles to set the URFR

- IFRS 17 does not require a particular estimation technique for determining the long-term rates. IFRS 17.B78 and B82 highlight the key principles an entity should follow when performing such estimation:
  - Maximize the **use of observable inputs**, reflect current market conditions and develop unobservable inputs using the best information available in the circumstances;
  - Develop unobservable inputs using the best information available in the circumstances and the entity might place **more weight on long-term estimates** than on short-term fluctuations.
- Consistent with these principles, the subcommittee agreed on the following desirable characteristics when setting the long-term discount curve:
  - **Stability**: The URFR would be more stable over time than the rates in the observable period
  - **Smoothness**: Interpolated rates would follow a smooth path from the last observable point to the URFR
  - **Simplicity**: The approach would be easy to understand and implement
- All principles and characteristics cannot necessarily be met to the same degree at once, it is a balancing act.

Methodology used in draft ed note

Process to update the URFR

- AGC, CLIFR, and PCFRC are committed to a transparent regular process to review the URFR
- Actuarial judgment applied to ensure appropriateness and update the recommendation over time
- Balance between short-term fluctuations/undue volatility vs. long-term trends in interest rates

Four main methodologies (as at Dec 31, 2019)

1. Historical median :	Median of historical nominal rates since 1991 (4.2%)
2. Real-rate + inflation target :	Average of historical long-term real rates since 1936 + inflation target (4.1%)
3. Forward-looking economic :	Long-term GDP growth forecast + inflation target (3.5%)
4. Historical economic :	Historical GDP growth and CPI since 1999 (4.2%)

Starting level of the URFR : 4.0%

- Based on the four methodologies listed above
- Initial reasonable range: 3.5% to 5.0%

Feedback received from commenters

Process to update the URFR

- Define a transparent, predictable, formal, impartial and systematic updating process
- Clarify the update frequency, the triggers and the external input related to the update

Four main methodologies

Specific comments :

1. Historical median : Caution nominal rates might not be mean-reverting & lack of forward-looking inputs
2. Real-rate + inflation target : More robust, could consider other variables (monetary policy, demographics, savings glut …)
3. Forward-looking economic : Real-rates might differ from GDP Growth, adjustments might be needed
4. Historical economic : Blend of the above, not forward-looking, real-rate/GDP growth relationship, …)

General comments :

- Put more weight on observable/recent data hence we would balance historical and forward-looking inputs
- Clarify the term of the estimated rate (i.e. long-term premium estimation)

Starting level of the URFR : Too high

- Some feel a range of 3.0% to 3.5% is more appropriate

Our takeaways

Process to update the URFR

- Establish a clear and predictable process

Starting Level: 4.0% is too high

- Long-term trends are not reflected at an appropriate pace
- Put more weight on recent data

Methodologies

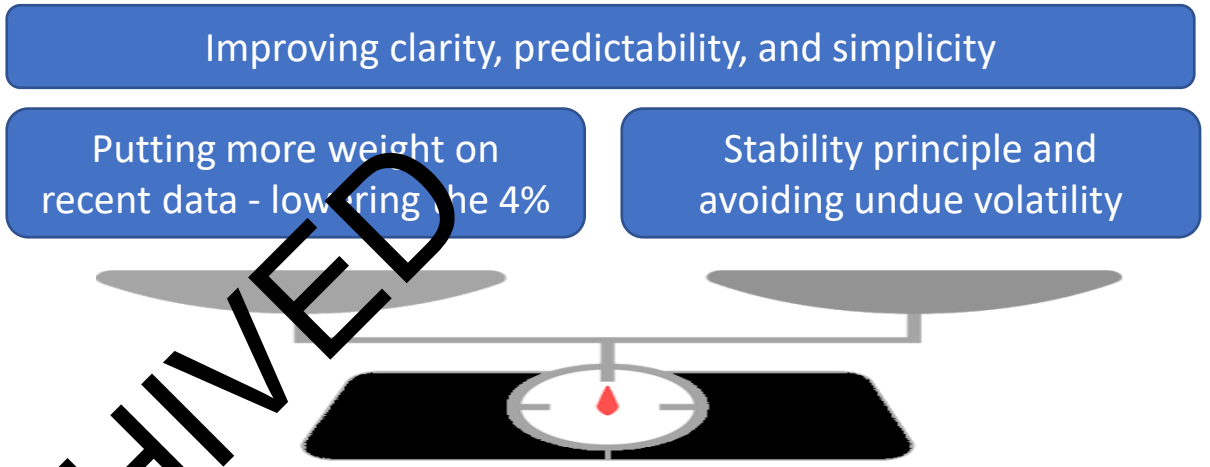
- Abandon historical (1. and 4.) : Not enough weight on recent trend
- Abandon forward-looking (3.) : GDP might need adjustments
- Keep, adjust, and improve method 2. Real-rate + inflation target

Follow-up with commenters – 3.0% estimate

- The BoC neutral rate seems to be a good forward-looking reference for short-term rate expectations (2.25% confirmed last fall)
- The term premium is more open to debate (some commenters suggested 0.75% and other inputs pointed towards 1.2% to 1.5%)

Path forward

Summary: The subcommittee is trying to balance:

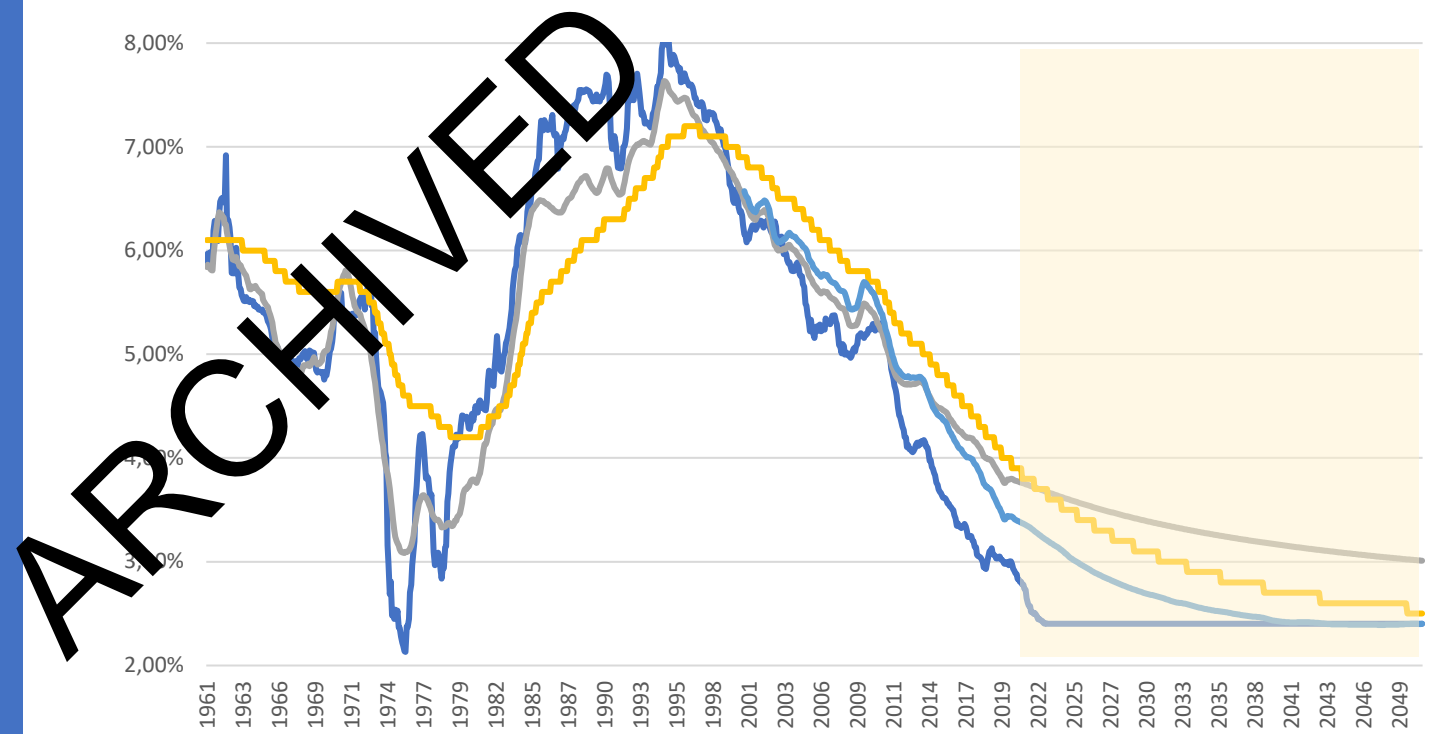


- Current analysis:
  - A single time-weighted average of real-rates could achieve this balance;
  - The inflation target is still relevant as a forward-looking add-on to the real-rate approach.
- If current low interest rate environment continues, we will likely end up with a lower rate than 4.0% as at Jan 1, 2022, and this rate will continue to decline for the foreseeable future.
- We're considering stabilizing measures (e.g., capping the change, rounding) to prevent drastic changes (e.g., inflation target change).
- We are committed to a disciplined and transparent approach to update the URFR.

Path forward

Type of analysis performed

- We continue to explore a variety of methods considering volatility and speed of convergence.



Analysis of ultimate risk-free rate

- Based on the **external feedback** and further **subcommittee discussions,** we settled on a main approach to set the URFR :

  Historical [short term real rates + term premium] + Inflation target

- Main reasons :
  - Robust, similar to Solvency II approach;
  - Includes historical as well as forward-looking inputs;
  - Allows some level of predictability of the estimate.

- Consideration of different weighting approaches for estimating the **historical** part, covering multiple time horizons and parameters :
  - Simple averages/medians;
  - Simple moving averages;
  - Average of averages;
  - Time-weighted average (as proposed in AMF external consultation paper and exponential moving average);
  - Time-weighted median.

- Top candidates

Methodology	Time period/Parameter	Comments
Simple moving average	25 years	Simple, but equal weights to historical period
AMF-time weighted average	1961 + & 1991 +	Too stable and historical weights slowly leveling
AMF-time weighted moving average	30 years	Too reactive and starting level on the low side
Exponential moving average	20, 25, and 30 years	Balance between simplicity, reactivity, stability, and level

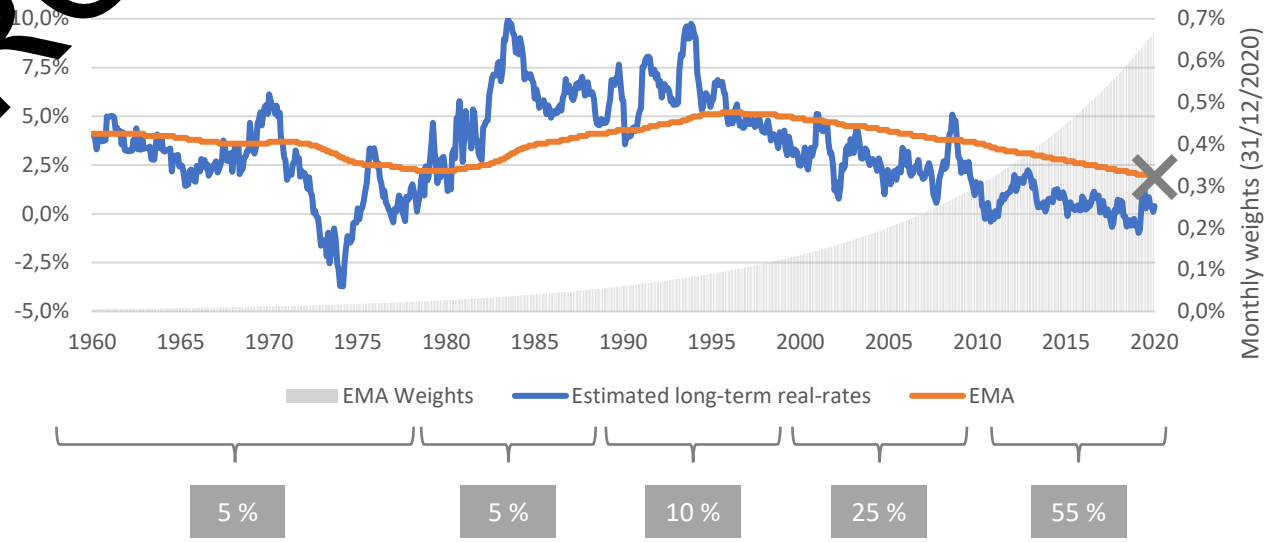
Analysis of ultimate risk-free rate

- The subcommittee settled on **Exponential Moving Average (EMA)** approach
- Main reason – Great balance between :
  - Simplicity : Simple recursive form :

$$\mathbf{EMA(t) = Data(t) * \alpha + EMA(t-1) * (1 - \alpha)}$$

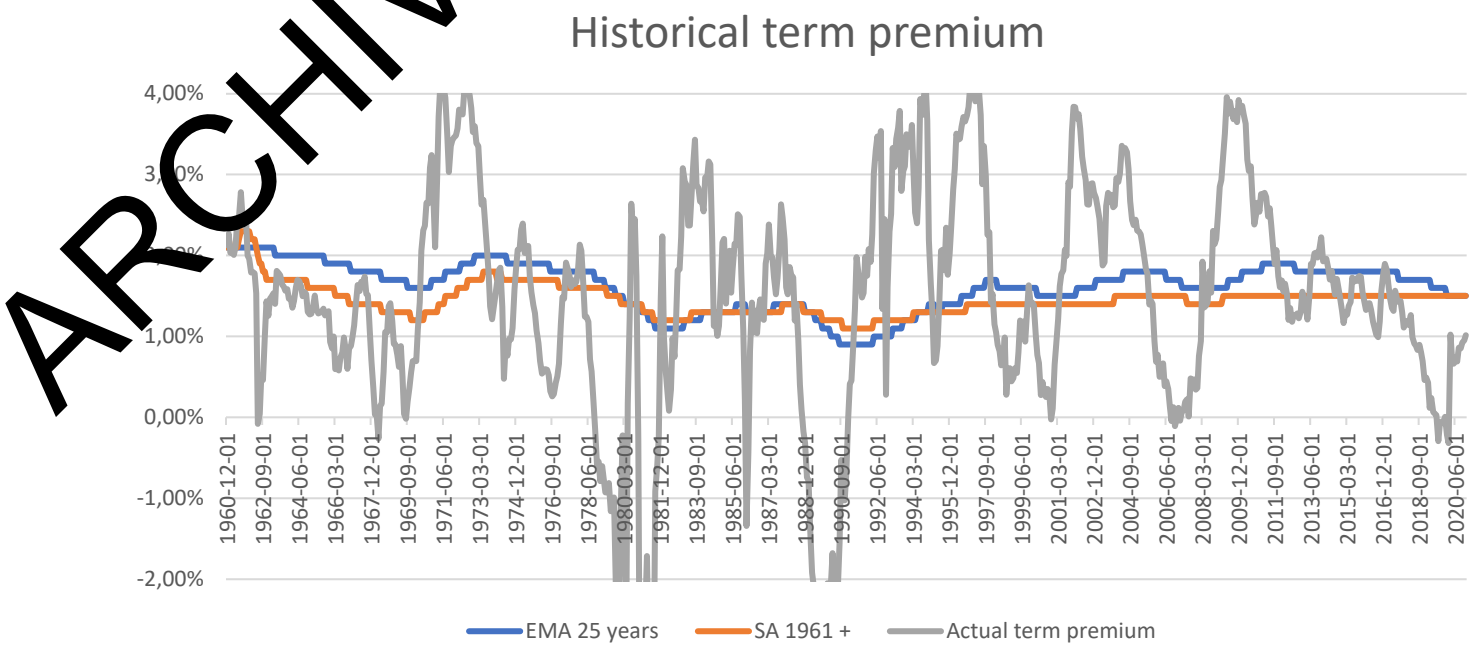
  - Reactivity : Well-known technical analysis method to investigate recent trends;
  - Stability : Time-period parameter $\alpha = 2 / (N + 1)$ can be adjusted to avoid undue volatility. Potential values for N: 240, 300, or 360 months;
  - Level : Expected to fall in the 3.00% to 4.00% range as at 2022-12-31.
- All available historical data can be considered (ex : 1961 to today) and the historical decreasing weighting factors remain constant throughout time (i.e. α for last month data, **α (1- α)** for second last month data, …)

EMA approach and corresponding weights N=25



Analysis of ultimate risk-free rate

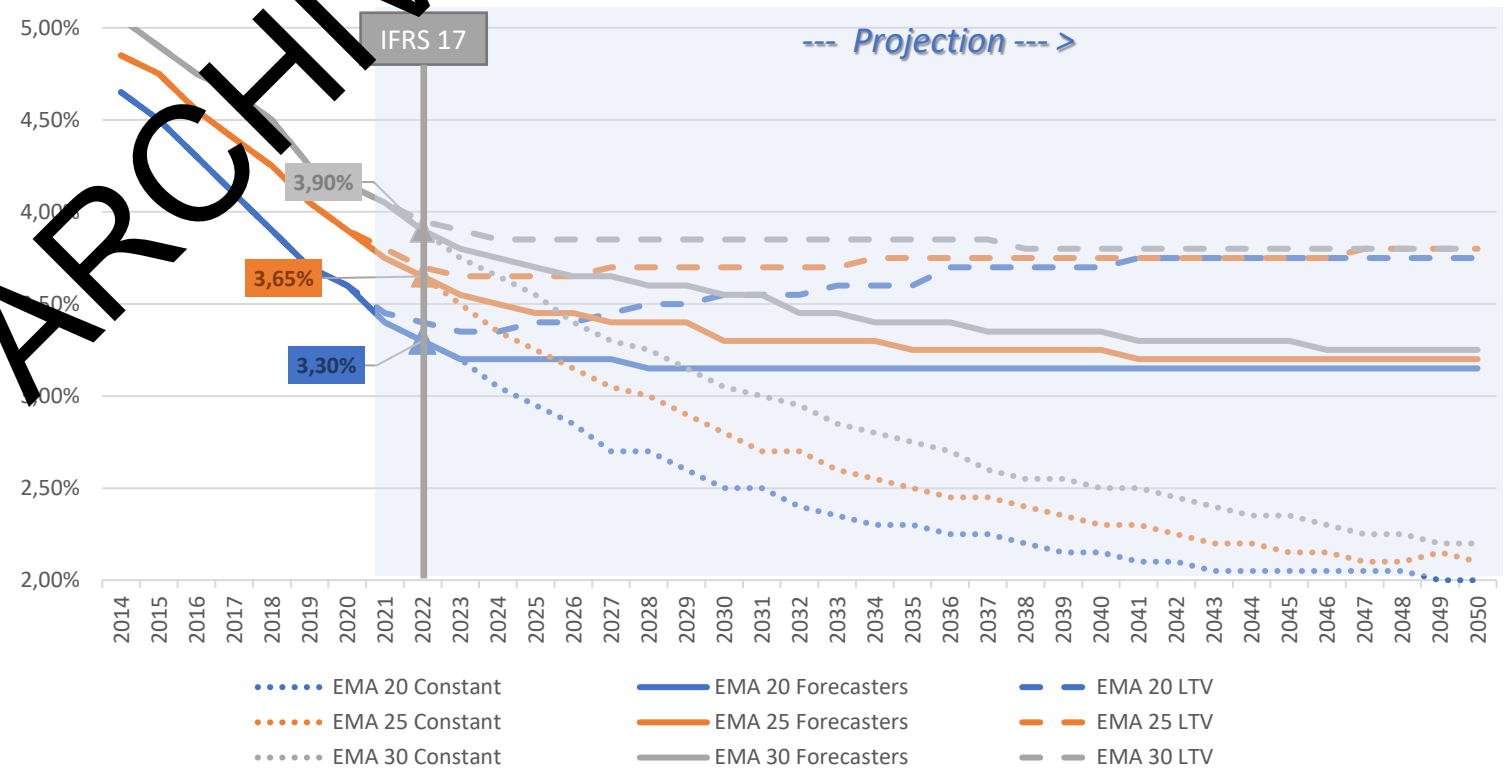
- Consideration around using a separate method between short-term real rates and term premium.
  - Term premium appears to be cyclical
  - Using a long-term simple average
    - Pros : Avoid cyclical effect, consistent with long-term estimate
    - Cons : Would not reflect fundamental/structural change, less market-consistent
  - Conclusion: For simplicity, and based on comments received (i.e., put more weight on recent data), we decided to keep the same averaging method for real-rates and the term premium.



Analysis of ultimate risk-free rate

- **EMA approach** – Challenge in setting the N parameter
  - Different economic scenarios were tested [ST rates; term premium; infl. tgt], where long-term risk-free rate (LTRFR) = ST real rate + term premium + inflation target
    - Constant rate scenario (LTRFR of 1.9% [-1.9%;1.8%;2.0%] , 2021/03 onward)
    - Professional forecaster scenario (LTRFR of 3.1% [-0.4%;1.5%;2.0%], reached in 2025)
    - Long-term view scenario (LTRFR of 3.75% [0.25%;1.5%;2.0%], reached in 2025)
  - Considering
    - N = 20 years (240 months) : Quite reactive, starting IFRS 17 level at YE 2022= 3.30 %
    - N = 25 years (300 months) : More stable, starting IFRS 17 level at YE 2022 = 3.65 %
    - N = 30 years (360 months) : Starting level too high at YE 2022 = 3.90 %

UKRP Projections under Different Methodologies and Economic Scenarios



URFR recommendation

- The sub-committee recommends using real rates + term premium + inflation to set the URFR.
  - The sources of data and formulas used would be detailed in the educational note to allow for transparency and visibility into potential changes to the URR.
- **Method: EMA with parameter N = 25 years (300 months) for calculating both the real rates and term premiums**
  - URFR as at 2022 year-end is 3.65 % (between 3.65% and 3.70% depending on the scenario)
  - If rates remained at March 2021 level, the URFR would reach 3.5% by the end of 2023, and 4% in 2028

Additional considerations:

- **Rounding: Nearest 5 bps**
  - Real-rates and term premium are rounded separately
  - Balance between simpler representation and minimum change
- **Update frequency: Annual**
  - Consistent with BoC neutral rate & current URR revision frequency
  - Note : Pension plan curve is updated each month.
- **Update cap: Cap any annual update to a ± 15 bps change**
  - Avoid drastic changes coming from any BoC inflation target changes
  - Consistent with Solvency II method
  - Within upcoming expected revision under various scenarios
- **Economic barometer:** Plan to add a discussion on the neutral rate window in the educational note and to use it to review the appropriateness of the methodology and resulting URFR in the future.

Liquidity Premium

Principles adopted to set the liquidity premium

- IFRS 17 does not require a particular technique for determining the liquidity premium. However, IFRS 17.B78-B85 highlight the key principles to follow when performing such estimation:
  - Maximize the use of observable inputs and reflect current market conditions.
  - Exercise judgment to assess the degree of similarity between the features of the insurance contracts and assets with observable prices and make further adjustments as needed.
  - For liquidity premiums beyond the last observable point, the entity might place more weight on long-term estimates than on short-term fluctuations.
- Where insurance contracts are highly illiquid the discount rate could be set at a rate that is higher than the expected yield or market return on a portfolio of (less illiquid) assets. The actuary would understand the implications of setting a discount rate that creates a negative bias in net investment results.

Methodology used in draft ed note

Liquidity characteristics

- The liquidity characteristics of an insurance contract can be qualitatively assessed by considering:
  - ✓ Exit value
  - ✓ Inherent value
  - ✓ Exit cost
- All characteristics of an insurance contract need to be taken into consideration in such an assessment:
  - ✓ Increase liquidity: Cash surrender value, return of premiums, etc.
  - ✓ Decrease liquidity: Level premium payments, guarantees, surrender charges etc.

Hybrid approach for setting the liquidity premium

- Public bond market spreads (provincial for liquid insurance contracts and corporate for illiquid insurance contracts) are adjusted to remove the expected probability of default and unexpected default.
- For illiquid insurance contracts, an adjustment of 50 bps is added to reflect additional illiquidity based on spreads of private debts and mortgages

Starting level of the ultimate illiquidity premium: 70 bps for liquid insurance contracts and 150 bps for illiquid insurance contracts

- Similar to the risk-free rate, an ultimate liquidity premium needs to be set.
- The ultimate liquidity premium was derived using the historical average of the liquidity premium for long assets and the overlay adjustment is consistent with highly illiquid assets such as private debt and mortgages.

Feedback received from commenters

Liquidity premium might be too high

- The observable and ultimate liquidity premiums appear to be high
- Liquidity premium might not necessarily be related to liquidity, lots of things seem to be subsumed in the liquidity premium.
- Caution in considering historical data:
  - ✓ Recent liquidity premium might be lower than in the past
  - ✓ Place more weight on currently observed liquidity premiums in financial market

Quantitative criteria to classify insurance contracts as liquid/illiquid

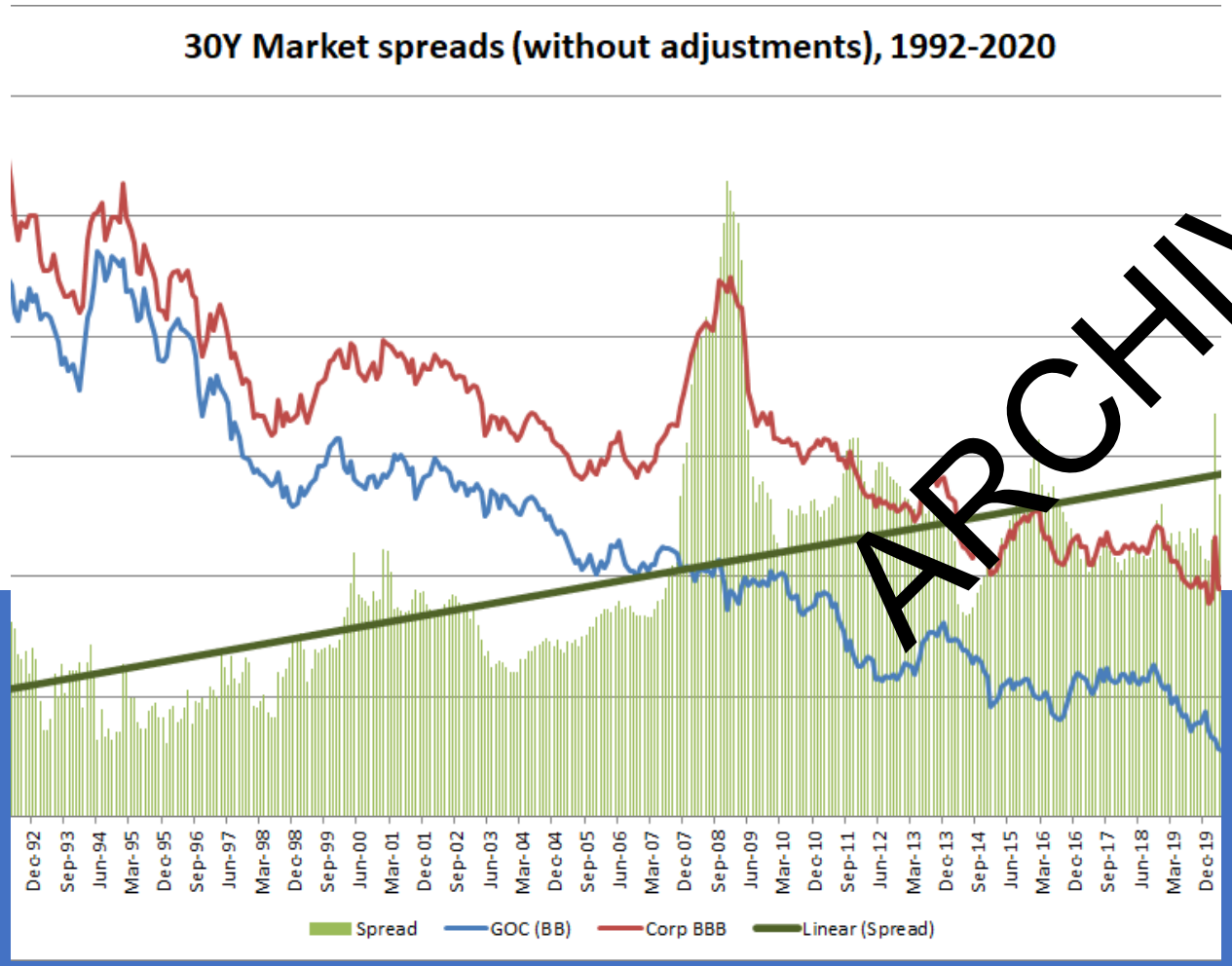
- Minimum quantitative criteria should be set for defining insurance contracts that may be deemed to be illiquid

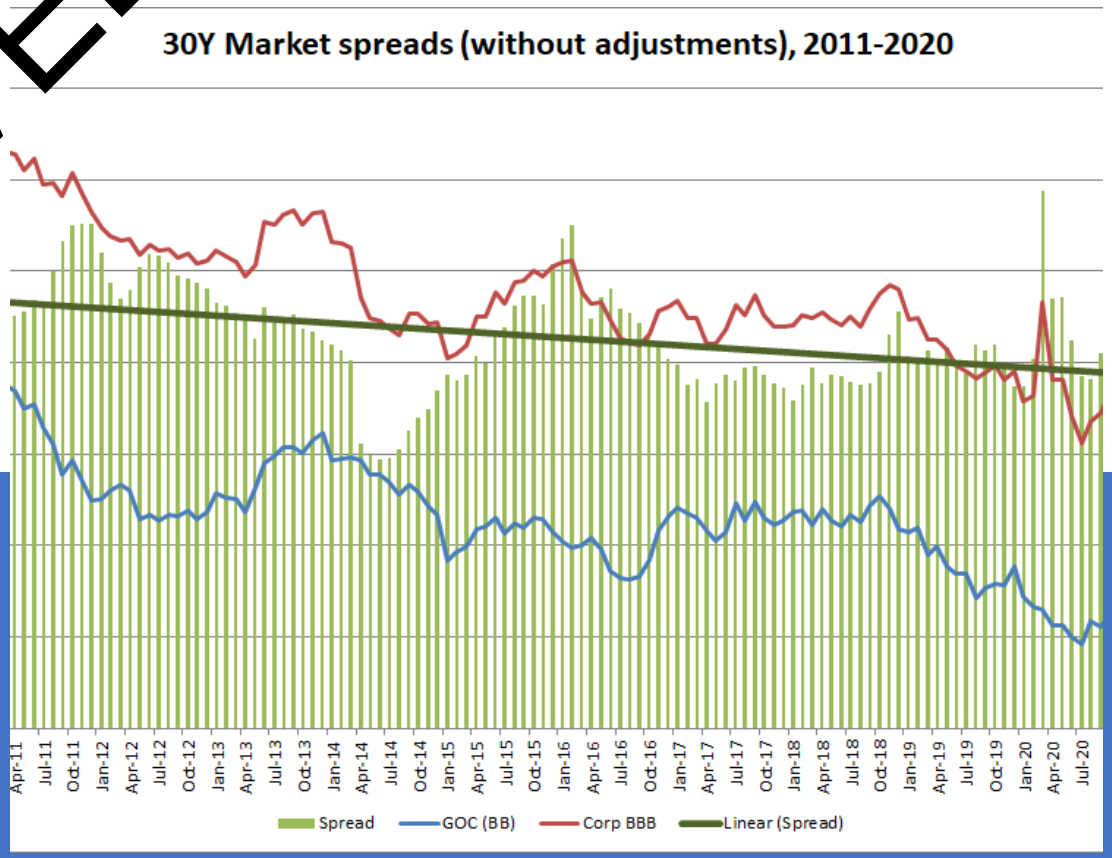
Documentation of the methodology used and the process to update the ultimate liquidity premium assumption

- Add further documentation for the method used to set the ultimate liquidity premiums.
- Establish a clear and predictable process for updating the assumption.

Our observations

- The yields of government of Canada bonds and corporate bonds are trending down over time. However, spreads are trending up, even if we exclude the outlier around 2008.
- The spreads are trending down slightly over the past ten years.
- The ten-year average of Corporate BBB spreads is higher than a historical lifetime average.
- After the removal of the credit risk adjustment from the average of the spreads, the resulting liquidity premiums would also follow the same pattern as the spreads shown here.





Our takeaways

Liquidity premium might be too high

- Comments imply liquidity premiums are lower today than in the past. There is a slight downward trend in recent years, however, our estimate was based on a longer-term basis.
- If we put more weight on recent data, we would revise our estimates up rather than down.
- There may be different views around the liquidity premium definition, but we feel comfortable the approach we adopted is aligned with IFRS 17 requirements (B81-B85).

Quantitative criteria to classify insurance contracts

- The draft ed note has presented a framework for analyzing the level of liquidity for various products.
- Companies need to set liquidity premiums based on their own product design, views on liquidity, and asset mix (where a top-down approach is used).

Follow-up with commenters

- We asked for clarity around the comments that liquidity premiums were trending down, in some instances it was based on judgment considering recent changes in the market.
- One commenter suggested we remove outliers (e.g., financial crisis).

Path forward

Summary: The subcommittee is reviewing the approach and considering refinements

- Our approach is appropriate and aligned with IFRS 17. We applied a top-down approach and removed the credit risk and market risk premiums.
- Refinements being considered:
  - The weighting scheme of historical data and whether we put more weight on recent data
  - The approaches to calculate the market risk premium (unexpected credit loss)
  - The loss given default (LGD) assumption
  - The approach to calculate the liquidity premium ratio by term
- The changes are not expected to significantly impact the current estimates.
- Further documentation of the method used and the process to update the ultimate liquidity premium.

Analysis of ultimate liquidity premium (illiquid contracts)

Historical credit spreads

Step 1: Collected market data from Bloomberg (1992-2020)

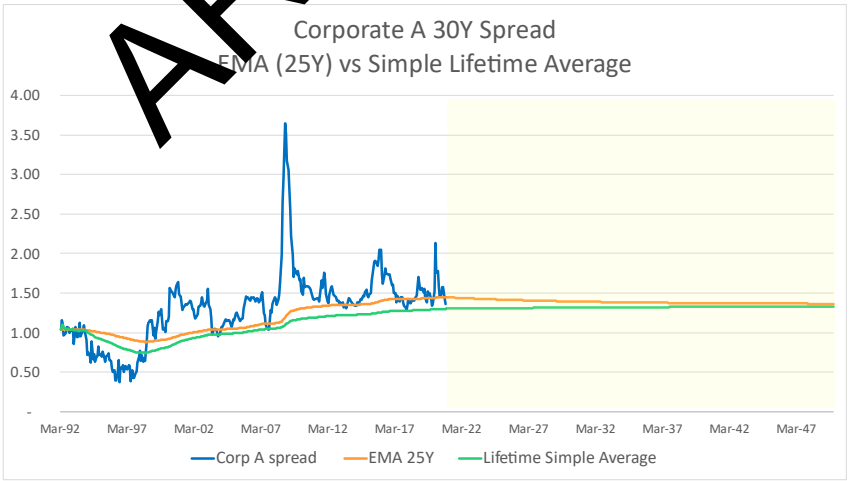
Step 2: Calculated the lifetime average of spreads between corporate bonds (50% A, 50% BBB) and risk-free rate for the most illiquid bucket, for the 30-year term.

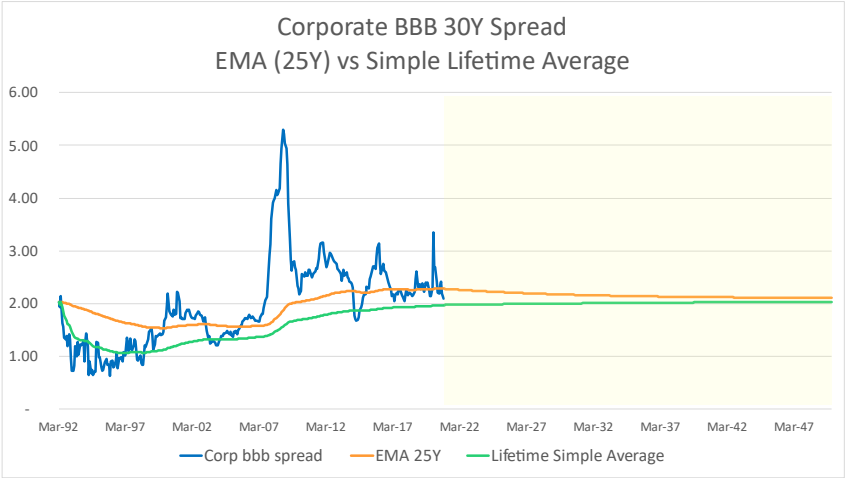
- The subcommittee considered different weighting approaches including EMA (N=25 years), in order to be consistent with risk free rates.
- As of YE 2020:

	EMA	Simple Average
Corp A	1.41	1.30
Corp BBB	2.22	1.97
Average	1.82	1.64

* This table summarizes the difference in historical spread under different approaches, to obtain the liquidity premium the default adjustment must be subtracted and the 50bps constant added

- Compared to lifetime simple average, the EMA approach would yield a higher ultimate liquidity premium assumption due to an increasing trend in the credit spread
- Some members preferred using a simple average approach to be internally consistent between credit spreads and the credit default adjustment (non-time varying). Some members preferred using EMA to be consistent with risk free rates and the comments received regarding more weight on recent estimates. **We chose the simple average weighting of the various factors.**





Analysis of ultimate liquidity premium (illiquid contracts)

Credit default adjustments

Step 3: Calculated credit default adjustment = expected credit loss (ECL) + unexpected credit loss (UCL)

- ECL was calculated using compounded average default rates from S&P global default study and a loss given default assumption.
- $Expected\ default\ adjustment_t = \left(1 - (1 - cumulative\ PD_t)^{\frac{1}{t}}\right) * LGD$
- The unexpected credit loss is calculated using the average of three methods: flat 100% margin, LICAT CoC, Basel III CoC

Refinements:

- Updated the default data to the most recent 2020 SP default study
- Revised the LGD assumption to 45% considering results from various studies[1].
- Overall, this led to little change in the ultimate liquidity premium

Step 4: An additional liquidity adjustment is added to account for the fact that illiquid insurance contracts are more illiquid than investment grade corporate bonds. The adjustment brings the liquidity premium more in line with illiquid assets such as privates and mortgages. The subcommittee proposed a liquidity premium adjustment of 50bps[2].

Resulting Ultimate Liquidity premium (illiquid contracts)

	Simple Average
Lifetime average credit spreads	1.64
Average ECL & UCL adjustment	(0.64)
Additional adjustment	0.50
Ultimate Liquidity Premium	1.50

The estimate is expected to be stable until 2022 if the current liquidity premium persists in the next two years. There is not a strong trend unlike the risk-free rates.

1. LGD is up to 40% for global large corps: https://www.globalcreditdata.org/system/files/documents/gcd_lgd_report_large_corporates_2018.pdf. LICAT QIS 6: LGD = 45% https://www.osfi-bsif.gc.ca/eng/fi-if/rg-ro/gdn-ort/pp-do/pages/qis6_cr.aspx, consistent with BIS paper https://www.bis.org/bcbs/publ/d424.pdf but OSFI did not explicitly state the final assumption. Dec 2020 S&P Default, Transition, and Recovery: U.S. Recovery Study: Clouds Loom As Defaults Rise: The long-term average recovery is ~40% or a LGD of 60% for US. Moody's credit study: ~50% (Moody's breaks down the recovery rates by priority positions and LGD is a range).
2. This is the lower end estimate of available reports from Willis Towers Watson, Phillips, Hager & North Investment Management, and Pemberton Asset Management. The subcommittee members also checked their internal data sources and confirmed they are consistent with the external reports.

Analysis of ultimate liquidity premium (liquid contracts)

Spread and credit default adjustments

The derivation of the liquidity premium for liquid contracts is similar to the approach used for illiquid contract, however, the reference portfolio consists of provincial bonds and there are no further adjustments

Step 1: Collected market data from Bloomberg (1992-2020)

Step 2: Calculated the lifetime average of spreads between provincial bonds and risk-free rate for the 30-year rate for all tenors

Step 3: Calculated credit default adjustment = expected credit loss (ECL) + unexpected credit loss (UCL), assuming an AA credit rating

- Some members believe using Corp AA credit adjustment is too high given the historical default experience of the provincial bonds so the adjustment should be close to 0 bps.
- Using the corporate AA default rate is conservative and was a judgment area, as a result there is judgment in setting the ultimate liquidity premium that could lead to more stability in the estimate

The resulting ultimate liquidity premium is presented in the table below:

Lifetime average credit spreads	0.94
Average ECL & UCL adjustment	(0.27)
Additional adjustment	-
Ultimate Liquidity Premium	0.67

Analysis of liquidity premium

Observable period

- Objective was to find a simple way to adjust observable market spread data for default risk
- We followed an approach very similar to what was done for the ultimate liquidity premium:
  - Step 1: Collect historical data from Bloomberg for provincial or investment grade corporate bonds for each key tenor
  - Step 2: Calculate an expected and unexpected default adjustment based on the same data source and assumptions as the ultimate liquidity premium, for each key tenor
  - Step 3: Based on historical spread and default adjustment, calculate the liquidity premium ratio as 1 - credit default adjustment from step 2/lifetime average spreads from step 1
  - Step 4: Based on the information in step 3, perform a weighted average calculation of the default adjustment across key tenors. The approach was refined to put more weight on longer tenors, which increased the default adjustment
    - We used the average of 5Y, 10Y, 30Y instead of simple average across the tenors. Details can be found in the appendix.
- **For illiquid contracts, revised the credit default adjustment to 30% of the credit spreads, up from an original estimate of 25% in the observable period.**
- For liquid contracts, the subcommittee landed on using 10% credit adjustment for the observable period in between the Corp AA adjustment and provincial adjustment.

Liquidity premium Recommendation

- The liquidity premium ratio in the observable period will be revised to 70% from 75% for illiquid contracts and remain at 90% for liquid contracts.
- The constant liquidity adjustment will remain at 50 bps.
- The ultimate estimates will remain unchanged at 150 bps for the illiquid contracts and 70 bps for liquid contracts.
- Same rounding, update frequency and update cap as the ultimate risk-free rate.

Timeline

Timeline to revise guidance

Deliverables	Timeline
1. Summary of comments received and subcommittee's recommendation for changes in approach shared with CLIFR	Early April
2. CLIFR's recommendations shared with other CIA committees for comments	End of April/Early May
3. CLIFR's recommendation reviewed by Actuarial Guidance Council	May
4. Recommendations presented to the membership	June/July
5. Publication of document summarizing comments and responses	September
6. Publication of final version of the discount rate educational note	End of 2021/Early 2022

Thank you

Appendix - URFR Starting Point and Projection

Method	EMA(20)			EMA(25)			EMA(30)		
Scenario	Constant	Forecasters	LTV	Constant	Forecasters	LTV	Constant	Forecasters	LTV
12/31/2014	4.65%	4.65%	4.65%	4.85%	4.85%	4.85%	5.05%	5.05%	5.05%
12/31/2015	4.50%	4.50%	4.50%	4.75%	4.75%	4.75%	4.90%	4.90%	4.90%
12/31/2016	4.30%	4.30%	4.30%	4.55%	4.55%	4.55%	4.75%	4.75%	4.75%
12/31/2017	4.10%	4.10%	4.10%	4.40%	4.40%	4.40%	4.65%	4.65%	4.65%
12/31/2018	3.90%	3.90%	3.90%	4.25%	4.25%	4.25%	4.50%	4.50%	4.50%
12/31/2019	3.70%	3.70%	3.70%	4.05%	4.05%	4.05%	4.25%	4.25%	4.25%
12/31/2020	3.60%	3.60%	3.60%	3.90%	3.90%	3.90%	4.15%	4.15%	4.15%
12/31/2021	3.40%	3.40%	3.45%	3.75%	3.75%	3.80%	4.05%	4.05%	4.05%
12/31/2022	**3.30%**	**3.30%**	**3.40%**	**3.65%**	**3.65%**	**3.70%**	**3.90%**	**3.90%**	**3.95%**
12/31/2023	3.20%	3.20%	3.35%	3.50%	3.55%	3.65%	3.75%	3.80%	3.90%
12/31/2024	3.05%	3.20%	3.35%	3.35%	3.50%	3.65%	3.65%	3.75%	3.85%
12/31/2025	2.95%	3.20%	3.40%	3.25%	3.45%	3.65%	3.55%	3.70%	3.85%
12/31/2026	2.85%	3.20%	3.40%	3.15%	3.45%	3.65%	3.40%	3.65%	3.85%
12/31/2027	2.70%	3.20%	3.45%	3.05%	3.40%	3.70%	3.30%	3.65%	3.85%
12/31/2028	2.70%	3.15%	3.50%	3.00%	3.40%	3.70%	3.25%	3.60%	3.85%
12/31/2029	2.60%	3.15%	3.50%	2.90%	3.35%	3.70%	3.15%	3.60%	3.85%
12/31/2030	2.50%	3.15%	3.55%	2.80%	3.30%	3.70%	3.05%	3.55%	3.85%
12/31/2031	2.50%	3.15%	3.55%	2.70%	3.30%	3.70%	3.00%	3.55%	3.85%
12/31/2032	2.40%	3.15%	3.55%	2.70%	3.30%	3.70%	2.95%	3.45%	3.85%
12/31/2033	2.35%	3.15%	3.60%	2.60%	3.30%	3.70%	2.85%	3.45%	3.85%
12/31/2034	2.30%	3.15%	3.60%	2.55%	3.30%	3.75%	2.80%	3.40%	3.85%
12/31/2035	2.30%	3.15%	3.60%	2.50%	3.25%	3.75%	2.75%	3.40%	3.85%
12/31/2036	2.25%	3.15%	3.70%	2.45%	3.25%	3.75%	2.70%	3.40%	3.85%
12/31/2037	2.25%	3.15%	3.70%	2.45%	3.25%	3.75%	2.60%	3.35%	3.85%
12/31/2038	2.20%	3.15%	3.70%	2.40%	3.25%	3.75%	2.55%	3.35%	3.80%
12/31/2039	2.15%	3.15%	3.70%	2.35%	3.25%	3.75%	2.55%	3.35%	3.80%
12/31/2040	2.15%	3.15%	3.70%	2.30%	3.25%	3.75%	2.50%	3.35%	3.80%
12/31/2041	2.10%	3.15%	3.75%	2.30%	3.20%	3.75%	2.50%	3.30%	3.80%
12/31/2042	2.10%	3.15%	3.75%	2.25%	3.20%	3.75%	2.45%	3.30%	3.80%
12/31/2043	2.05%	3.15%	3.75%	2.20%	3.20%	3.75%	2.40%	3.30%	3.80%
12/31/2044	2.05%	3.15%	3.75%	2.20%	3.20%	3.75%	2.35%	3.30%	3.80%
12/31/2045	2.05%	3.15%	3.75%	2.15%	3.20%	3.75%	2.35%	3.30%	3.80%
12/31/2046	2.05%	3.15%	3.75%	2.15%	3.20%	3.75%	2.30%	3.25%	3.80%
12/31/2047	2.05%	3.15%	3.75%	2.10%	3.20%	3.80%	2.25%	3.25%	3.80%
12/31/2048	2.05%	3.15%	3.75%	2.10%	3.20%	3.80%	2.25%	3.25%	3.80%
12/31/2049	2.00%	3.15%	3.75%	2.15%	3.20%	3.80%	2.20%	3.25%	3.80%
12/31/2050	2.00%	3.15%	3.75%	2.10%	3.20%	3.80%	2.20%	3.25%	3.80%

Appendix – Data sources

Bloomberg series used for liquidity premium analysis:

- Risk free: GCAN12M Index, GCAN2YR Index, GCAN3YR Index, GCAN5YR Index, GCAN7YR Index, GCAN10YR Index, GCAN20YR Index, GCAN30YR Index
- Corporate A: C2871Y Index, C2872Y Index, C2873Y Index, C2874Y Index, C2875Y Index, C2877Y Index, C28710Y Index, C28720Y Index, C28730Y Index
- Corporate BBB: C2881Y Index, C2882Y Index, C2883Y Index,C2884Y Index, C2885Y Index, C2887Y Index, C28810Y Index, C28820Y Index, C28830Y Index

Bank of Canada series used for risk free rate analysis

- Risk free rate, Bank of Canada, series v122487 (bonds 10 year +), v122541 (T-Bills 3 months), v41690973 (CPI Information)[1]

1. Considering other potential data sources

Appendix – Credit default adjustments

Corp A Credit Adjustment								
UCL Methods	1	2	3	5	7	10	20	30
Flat 100% ECL	0.05%	0.06%	0.06%	0.08%	0.11%	0.14%	0.28%	0.41%
LICAT COC	0.10%	0.13%	0.18%	0.24%	0.30%	0.38%	0.44%	0.51%
Basel III	0.06%	0.07%	0.08%	0.10%	0.13%	0.16%	0.30%	0.41%
Average	**0.07%**	**0.08%**	**0.11%**	**0.14%**	**0.18%**	**0.23%**	**0.34%**	**0.44%**
Corp BBB Credit Adjustment								
UCL Methods	1	2	3	5	7	10	20	30
Flat 100% ECL	0.15%	0.18%	0.21%	0.28%	0.34%	0.43%	0.68%	0.82%
LICAT COC	0.23%	0.37%	0.44%	0.54%	0.61%	0.70%	0.82%	0.89%
Basel III	0.17%	0.20%	0.23%	0.29%	0.35%	0.44%	0.65%	0.77%
Average	**0.19%**	**0.25%**	**0.30%**	**0.37%**	**0.43%**	**0.52%**	**0.71%**	**0.83%**
Average of Corp A & Corp BBB	0.13%	0.17%	0.20%	0.26%	0.30%	0.37%	0.53%	0.63%

Ratio of credit adjustment / average	1	2	3	5	7	10	20	30
Corp A	13%	12%	14%	16%	18%	21%	26%	34%
Corp BBB	22%	24%	26%	28%	29%	31%	37%	42%
Average of Corp A & Corp BBB	**18%**	**18%**	**20%**	**22%**	**24%**	**26%**	**32%**	**38%**

Appendix 2

In order to select an ultimate risk-free rate to be used in the reference curves until the next update, effective on October 15, 2023, the ultimate risk-free rate was projected under three scenarios to the end of 2022 namely the "constant," the "forecasters," and the "long-term view" scenarios.

Under the "constant" scenario actual data were used up to March 31, 2021. From April 2021 onwards the March 31, 2021, rates were held constant at 1.9%. The 1.9% was calculated as the short-term real rate as at March 31, 2021, (estimated as the three-month T-Bill rate less the consumer price index (CPI) inflation target of 2%) plus the term premium as at March 31, 2021, and the inflation target (2%). The sum of these three terms corresponds to the long-term risk-free rate.

Under the "forecasters" scenario actual data were used up to March 31, 2021. From April 2021 onwards the five-year forecast of the following economic metrics were used: CPI inflation, three-month T-bill, and 10-year benchmark government bond rates. The forecast was sourced from the Department of Finance Survey of Private Sector Economic Forecasters. The term premium between long-term Canada bonds over the 10-year benchmark bond was approximated using historical data, which led to an add on of 0.4%. Under this approach, the long-term risk-free rate is expected to be 1.9% for the remainder of 2021, 2.2% in 2022, grades to 3.1% in 2025 and stays at that level thereafter.

Under the "long-term view" ("LTV") scenario the long-term risk-free rate grades to 2.27% in 2021, 2.64% in 2022, it then grades to 3.75% in 2025 and stays at that level thereafter. The 3.75% represents the neutral rate of 2.25% and an estimated historical term premium of 1.5%.

The forecasted ultimate risk-free rates under each scenario are provided below. Based on these results, an ultimate risk-free rate of 3.65% was determined to be appropriate. This ultimate risk-free rate would apply up to October 15, 2023.

Method	EMA(25)		
Scenario	Constant	Forecasters	LTV
12/31/2014	4.85%	4.85%	4.85%
12/31/2015	4.75%	4.75%	4.75%
12/31/2016	4.55%	4.55%	4.55%
12/31/2017	4.40%	4.40%	4.40%
12/31/2018	4.25%	4.25%	4.25%
12/31/2019	4.05%	4.05%	4.05%
12/31/2020	3.90%	3.90%	3.90%
12/31/2021	3.75%	3.75%	3.80%
12/31/2022	**3.65%**	**3.65%**	**3.70%**
12/31/2023	3.50%	3.55%	3.65%
12/31/2024	3.35%	3.50%	3.65%
12/31/2025	3.25%	3.45%	3.65%
12/31/2026	3.15%	3.45%	3.65%
12/31/2027	3.05%	3.40%	3.70%
12/31/2028	3.00%	3.40%	3.70%
12/31/2029	2.90%	3.40%	3.70%
12/31/2030	2.80%	3.30%	3.70%
12/31/2031	2.70%	3.30%	3.70%
12/31/2032	2.70%	3.30%	3.70%
12/31/2033	2.60%	3.30%	3.70%
12/31/2034	2.55%	3.30%	3.75%
12/31/2035	2.50%	3.25%	3.75%
12/31/2036	2.45%	3.25%	3.75%
12/31/2037	2.45%	3.25%	3.75%
12/31/2038	2.40%	3.25%	3.75%
12/31/2039	2.35%	3.25%	3.75%
12/31/2040	2.30%	3.25%	3.75%
12/31/2041	2.30%	3.20%	3.75%
12/31/2042	2.25%	3.20%	3.75%
12/31/2043	2.20%	3.20%	3.75%
12/31/2044	2.20%	3.20%	3.75%
12/31/2045	2.15%	3.20%	3.75%
12/31/2046	2.15%	3.20%	3.75%
12/31/2047	2.10%	3.20%	3.80%
12/31/2048	2.10%	3.20%	3.80%
12/31/2049	2.15%	3.20%	3.80%
12/31/2050	2.10%	3.20%	3.80%