Canadian Institute of Actuaries / Institut canadien des actuaires

Educational Note

IFRS 17 – Fair Value of Insurance Contracts

Committee on Life Insurance Financial Reporting

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The actuary should be familiar with relevant educational notes. Educational notes are not binding; rather they are intended to illustrate the application of the standards of practice. A practice that an educational note describes for a situation is not necessarily the only accepted practice for that situation nor is it necessarily accepted practice for a different situation. Responsibility for ensuring that work is in accordance with accepted actuarial practice lies with the actuary. As accepted actuarial practice evolves, an educational note may no longer appropriately illustrate the application of standards. To assist the actuary, the CIA website contains a reference of pending changes to educational notes.

MEMORANDUM

To: Members in the life and health insurance practice area

From: Steven W. Easson, Chair
Actuarial Guidance Council

Steve Bocking, Chair and Marie-Andrée Boucher, Immediate Past Chair
Committee on Life Insurance Financial Reporting

Date: June 30, 2022

Subject: **Educational Note: *IFRS 17 – Fair Value of Insurance Contracts***

The Committee on Life Insurance Financial Reporting (CLIFR) has prepared this educational note to provide guidance on how to determine the fair value of insurance contracts within the scope of the International Financial Reporting Standard (IFRS) 17. Further guidance on how to perform a fair value measurement is provided in "IFRS 13 – Fair Value Measurement."

This educational note is structured into five sections:

- Introduction
- Fair value approaches
- Market participants
- Considerations for determining fair value assumptions
- Other considerations

This educational note is written primarily from the perspective of Canadian actuaries and is not intended to duplicate any other guidance. Further information ("guidance") can be found in International Actuarial Association guidance or other Canadian Institute of Actuaries (CIA) documents.

A preliminary version of the draft of this educational note was shared with the following committees prior to publication:

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

A preliminary version of the draft of this educational note was also shared with the staff of the Accounting Standards Board (AcSB) to broaden consultations with the accounting community. Given that this educational note provides actuarial guidance rather than accounting guidance, the AcSB staff review was limited to citations of and any inconsistencies with IFRS 13 and 17.

CIA educational notes do not go through the AcSB's due process and therefore, are not endorsed by the AcSB.

The draft of this educational note was also presented to the Actuarial Guidance Council (AGC) in the months preceding the request for approval. CLIFR satisfied itself that it had sufficiently addressed the comments received on the draft of this educational note and it was published in October 2021.

The following highlights the changes between this educational note and the draft published version:

- Updates on references and wording to the final version of various educational notes;
- The own credit risk used in the numerical examples (Appendices C and D) was modified to 0.10% (instead of 0.25%) to better highlight that although transition contractual service margin (CSM) calculated under adjusted future cash flows (FCF) approach and appraisal value approach should largely be equivalent under similar assumptions, there may be minor differences due the discounting impact of some items.

Given that the changes made to the final version of this educational note relative to the draft published version were not substantial, the final version of this educational note was only subject to a limited review by the CIA committees.

The creation of this memorandum and educational note has followed the AGC's Protocol for the adoption of educational notes. In accordance with the CIA's *Policy on Due Process for the Approval of Guidance Material other than Standards of Practice and Research Documents*, this educational note has been prepared by CLIFR and has received approval for distribution from the Actuarial Guidance Council on April 12, 2022.

The actuary should be familiar with relevant educational notes. Educational notes are not binding; rather they are intended to illustrate the application of the standards of practice. A practice that an educational note describes for a situation is not necessarily the only accepted practice for that situation nor is it necessarily accepted practice for a different situation. Responsibility for ensuring that work is in accordance with accepted actuarial practice lies with the actuary. As accepted actuarial practice evolves, an educational note may no longer appropriately illustrate the application of standards. To assist the actuary, the CIA website contains a reference of pending changes to educational notes.

CLIFR would like to acknowledge the contribution of its subcommittee that assisted in the development of this educational note: Nicolas Lévesque (Chair), Benoît-Pierre Blais, Madison Bleich, Nicolas Carel-Renaud, Shaonan Fang, Marco Fillion, Matthew Garnier, Simon Girard, Julia Gudmundson, Emmanuel Hamel, Qian Ma, Peter McKeown, Étienne Morin, Cynthia Potts, and Michael Promislow.

Questions or comments regarding this educational to the Chairs of CLIFR and this subcommittee (noted above) at guidance.feedback@cia-ica.ca.

SWE, SB, MAB

Table of Contents

1. Introduction

IFRS 17 establishes principles for the recognition, measurement, presentation and disclosure of insurance contracts on transition to the new standard and subsequently. IFRS 13 ("Fair Value Measurement") provides guidance on fair value measurement. The purpose of this educational note is to provide supplementary guidance for measuring the fair value of insurance contracts within the scope of IFRS 17.

References to specific paragraphs of IFRS 17 and IFRS 13 are denoted by IFRS 17.XX and IFRS 13.XX, where XX represents the relevant paragraph number, except where direct quotes from the standards are as shown in the standard (i.e., paragraph XX).

The transition date is the beginning of the annual reporting period immediately preceding the date of initial application (the beginning of the annual reporting period in which an entity first applies IFRS 17). At the time of this writing, the date of the initial application is expected to be January 1, 2023 which means that the transition date is January 1, 2022. On transition, an entity shall apply IFRS 17 retrospectively by identifying, recognizing and measuring each group of insurance contracts as if IFRS 17 had always applied, unless impracticable, in which case the entity has the choice to apply the modified retrospective approach (MRA – IFRS 17.C6–C19) or the fair value approach (FVA – IFRS 17.C20–C24), subject to the requirements of the standard. It is important to note that the actuary would be aware of the differences in objectives and calculation frameworks between the MRA and FVA approaches, as they could lead to different measurements of the contractual service margin (CSM) at transition and subsequent measurements.

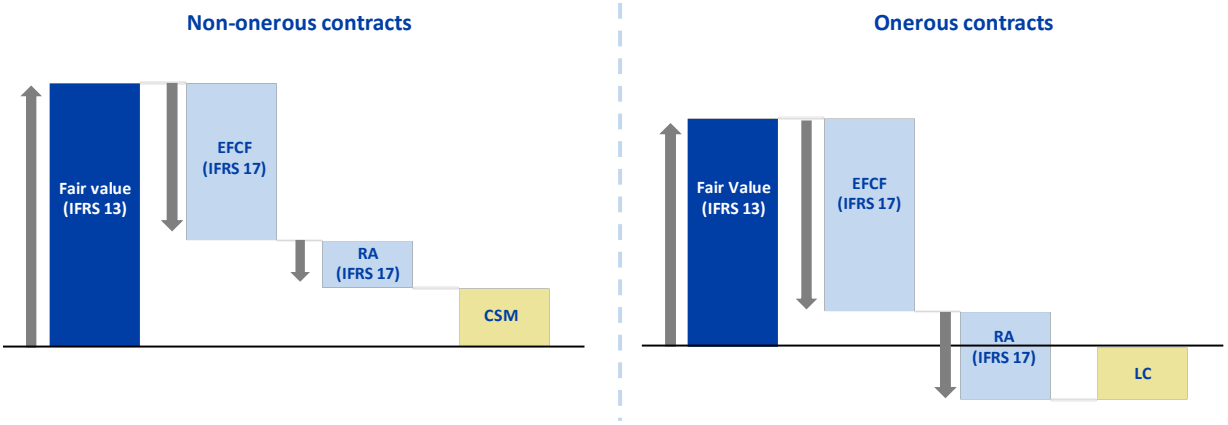
The guidance discussed in IFRS 17.C20–C24 does not address how to calculate the fair value of identified cash flows. Fair value guidance is provided in IFRS 13, which defines the fair value as: *"*…the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date (i.e. an exit price) (IFRS 13.9).*"*

As shown in the illustration below[1], the entity determines the CSM or the loss component (LC)[2] of the liability for remaining coverage (LRC) at the transition date as the difference between the fair value of the group of insurance contracts (IFRS 13)[3] and the present value of IFRS 17 fulfilment cash flows at that date. The fulfilment cash flows are shown in the table below as the sum of the present value of the estimates of future cash flows (EFCF) and the risk adjustment (RA). The fair value is also used in the measurement of insurance liabilities in a business combination.

[1] The illustration is for direct contracts only. Reinsurance contracts held can't be onerous, and thus the CSM balance would either be positive or negative. Refer to Section 5.2.1 for additional information.

[2] Although it is technically possible for the fair value of the group of insurance contracts (IFRS 13) to be lower than IFRS 17 fulfilment cash flows (and thus resulting in a loss component), it is not expected for the vast majority of the block of business being fair valued.

[3] IFRS 17 does not allow the application of a demand deposit floor when measuring insurance contracts, either under the general measurement or when using the fair value approach on transition. However, IFRS 17 requires entities to disclose the amount payable on demand in a way that highlights the relationship between such amounts and the carrying amount of the related contracts.



This educational note provides practical guidance on the following Canadian-specific issues relating to the fair value measurement of life & health (L&H) and property & casualty (P&C) insurance contracts under IFRS 17, including:

- typical use of fair value in Canada;
- different fair value approaches used in Canada;
- determination of a market participant in Canada; and
- considerations for determining assumptions of a market participant.

The guiding principles that the CLIFR subcommittee followed in writing this educational note were the following:

- First and foremost, consider Canadian-specific perspectives, rather than simply repeating international actuarial guidance.
- Provide application guidance that is consistent with the IFRS 17 and IFRS 13 standards and applicable Canadian actuarial standards of practice and educational notes, without unnecessarily narrowing the policy choices available in the IFRS 17 and IFRS 13 standards.
- Consider practical implications associated with implementation of possible alternative methods; in particular, ensure that due consideration is given to options that do not require undue cost and effort to implement.

Chapters 10, 11 and 12 of the *Application of IFRS 17 Insurance Contracts* educational note provide general guidance on fair value, business combinations and portfolio transfers, and transition, respectively. This educational note, published in October 2021, is an adoption of the final version of the International Actuarial Note 100 which was published in August 2021 by the International Actuarial Association.

2. Fair value approaches

2.1. Introduction to IFRS 13

IFRS 13 (“Fair Value Measurement”) provides guidance on fair value measurement.

Fair value is defined as *"…*the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date (i.e. an exit price) (IFRS 13.9)*."*

Although a comprehensive discussion of IFRS 13 is beyond the scope of this educational note, the first paragraphs of the standard provide a high-level overview of its concepts are worth replicating here:

> Fair value is a market-based measurement, not an entity-specific measurement. For some assets and liabilities, observable market transactions or market information might be available. For other assets and liabilities, observable market transactions and market information might not be available. However, the objective of a fair value measurement in both cases is the same—to estimate the price at which an orderly transaction to sell the asset or to transfer the liability would take place between market participants at the measurement date under current market conditions (ie an exit price at the measurement date from the perspective of a market participant that holds the asset or owes the liability).
>
> When a price for an identical asset or liability is not observable, an entity measures fair value using another valuation technique that maximises the use of relevant observable inputs and minimises the use of unobservable inputs. Because fair value is a market-based measurement, it is measured using the assumptions that market participants would use when pricing the asset or liability, including assumptions about risk. As a result, an entity's intention to hold an asset or to settle or otherwise fulfil a liability is not relevant when measuring fair value. (IFRS 13.2–3)

2.2. Introduction to fair value approaches

IFRS 13 states that the price of an asset or liability may be observable, but if it is not, it must be estimated (IFRS 13.2). Moreover, when a price is not observable, the entity measures the fair value of the asset or liability using another valuation technique that maximizes the use of relevant observable inputs and minimizes the use of unobservable inputs (IFRS 13.3). Finally, an entity shall use valuation techniques consistent with one or more of the following to measure the fair value: the market approach,[4] the cost approach,[5] and the income approach[6] (IFRS 13.62).

Given the lack of a liquid and observable market of insurance liabilities in Canada, it is expected than in most cases, the fair value of insurance contracts will be estimated using a method consistent with the income approach, such as a present value technique. A present value technique includes the following items (IFRS 13.B13):

a) an estimate of future cash flows for the asset or liability being measured;

[4] A valuation technique that uses prices and other relevant information generated by market transactions involving identical or comparable (i.e., similar) assets, liabilities or a group of assets and liabilities, such as a business.

[5] A valuation technique that reflects the amount that would be required currently to replace the service capacity of an asset (often referred to as current replacement cost).

[6] Valuation techniques that convert future amounts (e.g., cash flows or income and expenses) to a single current (i.e., discounted) amount. The fair value measurement is determined on the basis of the value indicated by current market expectations about those future amounts.

b) expectations about possible variations in the amount and timing of the cash flows representing the uncertainty inherent in the cash flows;

c) the time value of money, represented by the rate on risk-free monetary assets that have maturity dates or durations that coincide with the period covered by the cash flows and pose neither uncertainty in timing nor risk of default to the holder (i.e. a risk-free interest rate)[7];

d) the price for bearing the uncertainty inherent in the cash flows (i.e. a risk premium);

e) other factors that market participants would take into account in the circumstances;

f) for a liability, the non-performance risk relating to that liability, including the entity's (i.e. the obligor's) own credit risk.

The educational note, *Application of IFRS 17 Insurance Contracts* (see chapter 10), discusses two actuarial valuation techniques that would be consistent with the income approach, namely the following approaches: adjusted fulfilment cash flows and embedded or appraisal value (the latter is referred to as the appraisal value approach for the purpose of this educational note). A general description of each approach is provided in the following sections.

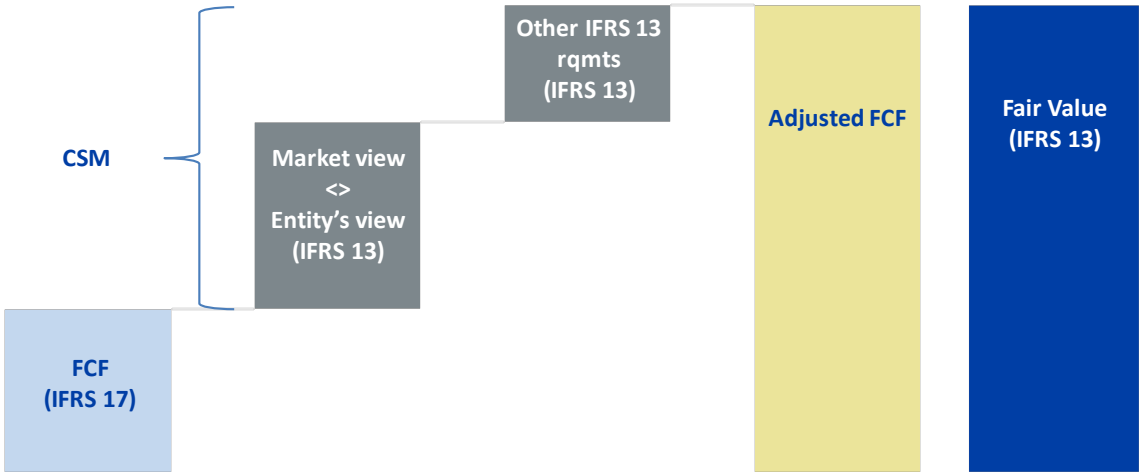
Given that both approaches have the same objective (i.e., estimating the fair value), they are expected to produce similar results under a consistent set of assumptions, as shown in Section 2.5. Thus, an entity would assess the practical implications of the two proposed approaches. Considerations could include, without being limited to, the availability and quality of data, ease of implementation, the number and complexity of adjustments, the level of judgment required, and ease of explanation of the results. For example, the appraisal value approach may be more practical for entities that perform regular appraisal/embedded value calculations (although some adjustments will be required), whereas other entities may prefer the adjusted fulfilment cash flows approach as it leverages on IFRS 17 concepts.

2.3. Adjusted fulfilment cash flows approach

IFRS 13.B13–B30 describe multiple present value techniques to estimate the fair value. One of the techniques described, the adjusted fulfilment cash flows approach (adjusted FCF), is similar to the one used in IFRS 17 to determine the fulfilment cash flows given that both standards require a discounted value of the risk-adjusted expected cash flows. Considering this, it is possible to adjust the IFRS 17 fulfilment cash flows to estimate the fair value of the group of insurance contracts.

Under the adjusted FCF, the IFRS 17 fulfilment cash flows are adjusted to reflect the perspective of a market participant (IFRS 13) rather than the entity's view (IFRS 17) and to include other IFRS 13 requirements not included in the IFRS 17 fulfilment cash flows, as illustrated below.

[7] Note that although IFRS 13.B13 refers to risk-free interest rates, it does not preclude the use of an illiquidity premium similar to IFRS 17. Additional guidance is provided in IFRS 13.B14 and in Section 4.3.1.



It should be noted that both adjustments are shown to increase the adjusted FCF relative to the FCF in the illustration above, but some adjustments may result in a decrease of the adjusted FCF as well. For example, expenses from a market participant view could be lower than the entity's view (e.g., economies of scale) and thus result in a decrease of the adjusted FCF.

Adjustments could be modeled by a simple add-on, by adjusting the IFRS 17 assumptions and/or by using a cost of capital framework (see Section 2.4 for additional details).

Adjustments that could be made under this approach are discussed in Section 4.

2.4. Appraisal value approach

2.4.1. General considerations

The appraisal value (AV) is routinely used in Canada for acquisition purchase prices, profitability analysis, and capital allocation purposes.

The AV can be defined as the price established by a prospective buyer to acquire a block of business. In the context of IFRS 17, the only component of the AV[8] relevant to fair value is the present value of in-force (PVIF), which consists of future after-tax profits less the present value of the cost of capital (CoC):

$$PVIF = PV\ (After\text{-}tax\ profits) - PV\ (CoC)$$

[8] The typical components of the AV are the adjusted net worth (ANW), the present value of the in-force business value (PVIF), and the value of new business (VNB), such that: AV = ANW + PVIF + VNB
The VNB is designed to measure the company's ability to produce new business, as well as to include any franchise or «brand» value. Under IFRS 17, the VNB is typically outside of the insurance contract boundary, so it would not be included in the fair value estimation (i.e., VNB = 0).
The ANW represents the realizable value of a company's net surplus position (i.e., the excess of assets over liabilities). It is relevant when the appraisal value is calculated in a market transaction where an entire entity is being acquired. It is not relevant when discussing the fair value of a single group of liabilities (i.e., ANW = 0).

In a market transaction, PVIF measures future expected profits and cost of capital related to the transfer of liabilities, together with supporting assets.

When calculating a fair value, as per IFRS 13, the transaction is assumed to take place in the principal market or in the most advantageous market. That means the transaction is expected to be priced so that profits will be just enough to cover the cost of capital, or when PVIF = 0. The fair value represents the amount of assets that would be required to take over the obligations/liabilities of the contracts[9].

Thus, using an AV technique, one must solve for the amount of assets that will be just enough such that:

PV (After-tax profits) = PV (CoC)[10]

In the equation above, both after-tax profits and the cost of capital should incorporate the liabilities, and hence, in the context of IFRS 17, take into consideration the CSM release pattern.

Under certain circumstances[11], it can be shown that the previous equation can be simplified to the following:

CSM = PV(CoC) – PV(After-tax profits embedded in the FCF)

In this relationship, the CSM can be viewed as the required amount of assets a market participant would require to provide for cost-of-capital and any profit shortfall (or excess) not embedded in the fulfilment cash flows.

2.4.2. After-tax profits

IFRS 17 after-tax profits and losses include:

- CSM amortized for services provided;
- change in risk adjustment for non-financial risk for risk expired;
- experience adjustments, if any (e.g., adjustments in Section 4.1);
- expected investment return on assets, subject to some adjustments such as credit/market risk (refer to Section 4 for a list of all possible adjustments);
- insurance finance income or expenses;
- other income / expenses, if any (e.g., non-attributable expenses);
- income tax expenses.

[9] Application of IFRS 17 Insurance Contracts – Question 10.6.

[10] Under LICAT/CARLI, the CSM is included in the capital resources (similar to available capital, risk adjustments and eligible deposits) and thus reduces the cost of capital. In other words, under LICAT/CARLI increasing the CSM would impact both sides of the equation, i.e., it would increase the PV (after-tax profits) and reduce the PV (CoC). Under MCT, the CSM does not impact the cost of capital. See Section 4.2.2 for additional information.

[11] Assets backing CSM earn the same return as assets backing Surplus, the CSM does not reduce the cost of capital and taxes are excluded.

To derive future after-tax profits, one will need to make multiple economic and non-economic assumption changes to IFRS 17 which need to be consistent with IFRS 13 principles. Adjustments that could be made under this approach are discussed in Section 4.

2.4.3. Discount rate

The present value is calculated using the rate of return that a typical market participant would expect to earn. This rate reflects the risks inherent in the business and the use of all financing source (e.g., debt and equity). This rate is often referred to as the weighted average cost of capital (WACC).

2.5. Cost of capital (CoC) framework

The Cost of capital (CoC) is calculated as follows:

$$CoC = \sum_t \frac{r_t \times C_t}{(1 + d_t)^t}$$

Where:

- C_t is the projected required capital amounts for each period, which may be the regulatory capital (see Section 4.2.6) at the target capital ratio (see Section 4.2.2);
- r_t is the CoC rate, which represents the compensation that the market participant requires for holding this required capital. This is usually the weighted average cost of capital rate (WACC) minus the after-tax rate earned on assets supporting the required capital (see Section 4.2.3);
- d_t is the discount rate, which is used to discount the costs of holding capital over time period t. This rate is often referred to as the WACC.

2.6. Illustrative examples

Numerical examples are presented in the Excel spreadsheet provided with this educational note and to Appendices C and D.

2.7. Business combination

As stated in question 10.1 of the educational note, *Application of IFRS 17 Insurance Contracts*, for insurance contracts acquired in a business combination, IFRS 17 states that the fair value of the contracts is the consideration received for those contracts (paragraph IFRS 17.B94). Business combinations may include other assets and liabilities, in which case the consideration received for the insurance contracts needs to be determined separately from the other assets and liabilities acquired and may exclude certain factors that might be considered in a business combination (e.g., value of new business).

3. Market participants

3.1. General considerations

IFRS 13.2 specifies that fair value is a market-based measure, not an entity-specific measure. In this sense, it must be based on assumptions that market participants would use.

IFRS 13 defines a market participant in Appendix A as:

> Buyers and sellers in the principal (or most advantageous) market for the asset or liability that have all of the following characteristics:
>
> a) They are independent of each other, ie they are not related parties as defined in IAS 24[12], although the price in a related party transaction may be used as an input to a fair value measurement if the entity has evidence that the transaction was entered into at market terms.
>
> b) They are knowledgeable, having a reasonable understanding about the asset or liability and the transaction using all available information, including information that might be obtained through due diligence efforts that are usual and customary.
>
> c) They are able to enter into a transaction for the asset or liability.
>
> d) They are willing to enter into a transaction for the asset or liability, i.e. they are motivated but not forced or otherwise compelled to do so.

Moreover, IFRS 13.16, IFRS 13.17, IFRS 13.22, and IFRS 13.23 provide some useful information regarding market participants and state the following:

> A fair value measurement assumes that the transaction to sell the asset or transfer the liability takes place either:
>
> (a) in the principal market for the asset or liability; or
>
> (b) in the absence of a principal market, in the most advantageous market[13] for the asset or liability.
>
> An entity need not undertake an exhaustive search of all possible markets to identify the principal market or, in the absence of a principal market, the most advantageous market, but it shall take into account all information that is reasonably available. In the absence of evidence to the contrary, the market in which the entity would normally enter into a transaction to sell the asset or to transfer the liability is presumed to be the principal market or, in the absence of a principal market, the most advantageous market. (IFRS 13.16–17.)
>
> An entity shall measure the fair value of an asset or a liability using the assumptions that market participants would use when pricing the asset or liability, assuming that market participants act in their economic best interest.
>
> In developing those assumptions, an entity need not identify specific market participants. Rather, the entity shall identify characteristics that distinguish market participants generally, considering factors specific to all the following:
>
> (a) the asset or liability;

[12] International Accounting Standards 24: Related Party Disclosure

[13] IFRS 13 defines the most advantageous market as: "The market that maximises the amount that would be received to sell the asset or minimises the amount that would be paid to transfer the liability, after taking into account transaction costs and transport costs."

(b) the principal (or most advantageous) market for the asset or liability; and

(c) market participants with whom the entity would enter into a transaction in that market. (IFRS 13.22–23.)

In order to perform a fair value measurement, the entity would therefore identify a profile of a hypothetical market participant. The profile would consider factors specific to the group of contracts being fair valued, the principal market for it (or, in its absence, the most advantageous), and market participants with whom the entity would be able to transact in that market. Key characteristics of a market participant would include being independent of the entity, knowledgeable of the asset or liability being valued, willing and able to enter into a transaction**.**

3.2. Considerations to determine the market participant in Canada

Based on the considerations discussed in Section 3.1, there are many possibilities of what could be considered a market participant for entities operating in Canada, such as:

- mid to large direct writers of insurance contracts who operate in the Canadian market;
- reinsurers that are in Canada and expanding into direct writing (i.e., vertical integration);
- banks expending into insurance;
- large international insurers entering the Canadian market;
- hedge funds and private equity firms;
- etc.

Key considerations related to determining market participants for most groups of insurance contracts being fair valued in Canada would include: the size of the block of business being valued, the type of business being valued, the jurisdiction of the block of business being valued and the type of buyers.

Size of the block being valued

The size of the block of business being fair valued could influence the identification of the market participants. Typically, a small market participant would not be included in the profile of hypothetical market participants for a larger insurer, as they would not be expected to either have the knowledge, ability, or willingness to enter into a transaction for blocks of business of the size measured by such insurers. For larger insurers, market participants with similar financial capacity, such as peers in the Canadian market or international insurers with interests in the Canadian market, for instance, could be more appropriate. However, the market participants for a smaller insurer could potentially include market participants of any size, but the determination of participants would also need to take into consideration the most advantageous market as stated in the IFRS 13 standard.

Type of business being valued

For most groups of contracts, the type of business being fair valued is another key driver in identifying the market participants. For example, it could be appropriate for a reinsurer to only include other reinsurers in their profile of a market participant (i.e., exclude direct writers) and

vice versa. Another example would be related to products that are not sold broadly by every insurer, such as segregated funds (life & health) or title insurance (P&C). It may be appropriate for an entity to exclude from the list of potential market participants any insurers that do not sell similar products as the ones being valued.

Jurisdiction of the block of business being valued

Although it is possible for an international insurer to enter the market and to be included in the profile of a market participant, the block of business being acquired will be subject to the jurisdiction/regulatory framework of the country of domicile (e.g., Canada). For example, for Canadian blocks of business, it is expected that the market participants will need to meet the Life Insurance Capital Adequacy Testing (LICAT)[14]/Capital Adequacy Requirements for Life and Health Insurance (CARLI) or Minimum Capital Test (MCT) requirements. International insurers may also have local regulatory requirement constraints that may need to be considered. For example, some global reinsurers may consider the requirements of Solvency II. However, the jurisdiction/country of domicile will generally be the main consideration in the fair value of the block being measured.

Type of buyers

The choice of the market participants will greatly influence how potential buyers may think about the transaction and what the important drivers will be. For example, a private equity firm is likely to view the fair value of the liability very differently than a direct writer. Another example would be a reinsurer that wishes to expand to direct writing. Although these are possible scenarios that could be considered in establishing a profile of market participant, it would be reasonable to only assume more traditional buyers as market participants for most groups of contracts being fair valued in Canada.

After identifying the profile of a hypothetical market participant, an entity would consider whether its current assumptions would differ from that of the market participants. These considerations are described in Section 4.

4. Considerations for determining fair value assumptions

This section discusses considerations when assessing the degree to which an entity's assumptions would align with a market participant perspective. In an orderly market transaction, it would be reasonable to expect that the market participant under its due diligence has access to the same information as the entity. As such, it would be reasonable to expect that the entity's own assumptions, which adequately reflect its experience and that of the market where applicable, would generally be appropriate for fair value measurement. However, adjustments would be expected when the entity has taken a specific view on an aspect of the valuation it is aware may diverge from the view of what it has defined as the market participant universe. For instance:

- Would an entity performing due diligence on the group of contracts being measured have reasons to change the entity's assumptions?

[14] For simplicity, the educational note make reference only to LICAT/CARLI (Life and Health) and MCT (P&C). However, other requirements could also apply, such as: Life Insurance Margin Adequacy Test (LIMAT), Mortgage Insurer Capital Adequacy Test (MICAT) or Branch Adequacy of Assets Test (BAAT).

- Is the entity aware of assumptions that would be materially different from their peers' (e.g., significant operational restructuring costs factored into expense assumptions)?
- Are there regulatory imposed requirements that would not be relevant in a market transaction?
- Etc.

In order to do so, the entity would consider all information available such as industry surveys, industry studies, discussions with their auditors, financial information of large public insurers, etc.

As discussed in previous sections, the fair value is a market-based measurement. It is measured using assumptions that market participants would use, reflecting market conditions at the measurement date. The use of hindsight in light of subsequent changes is not permitted (i.e., the entity can't adjust the market participant assumptions based on new information available after the measurement date). For the transition to IFRS 17, the measurement date is December 31, 2021 and thus fair value should only reflect the information available at that date. As of December 31, 2021, there was still uncertainty regarding upcoming changes due to the transition to IFRS 17 from key external stakeholders, most notably the Office of the Superintendent of Financial Institutions (OSFI), the Autorité des marchés financiers (AMF) and the Canada Revenue Agency (CRA). Final decisions made by these stakeholders could have an impact on the fair value calculation and thus on the resulting CSM at transition. As new information become available, this new information may need to be discarded, unless it was anticipated as of the measurement date. In other words, although AMF/OSFI/CRA are getting closer to their final decisions on the capital formula and taxation, the entity's assumption about what a market participant would require would be based on the best available information at the transition date.

Examples of how to model some adjustments under both the adjusted fulfilment cash flows approach and appraisal value approach are available in Appendix A.

4.1. Estimates of future cash flows

4.1.1. General considerations

Fair value of insurance contracts estimated using a present value technique requires an estimate of future cash flows for the asset or liability being measured. Some guidance is provided in IFRS 13.B23 and states the following:

> "The expected present value technique uses as a starting point a set of cash flows that represents the probability-weighted average of all possible future cash flows (i.e. the expected cash flows). The resulting estimate is identical to expected value, which, in statistical terms, is the weighted average of a discrete random variable's possible values with the respective probabilities as the weights. Because all possible cash flows are probability-weighted, the resulting expected cash flow is not conditional upon the occurrence of any specified event (unlike the cash flows used in the discount rate adjustment technique)."

This is a similar approach to the one used for determining the estimates of future cash flows under IFRS 17 (see IFRS 17.B37) and is also consistent with the guidance provided in the educational notes, *IFRS 17 Estimates of Future Cash Flows for Life and Health Insurance Contracts* (CLIFR) and *IFRS 17 Discount Rates and Cash Flow Considerations for Property and Casualty Insurance Contracts* (PCFRC).

The conceptual difference between IFRS 13 and IFRS 17 is that IFRS 13 assumptions are based on the market participant's view as defined in IFRS 13.22, "An entity shall measure the fair value of an asset or a liability using the assumptions that market participants would use when pricing the asset or liability, assuming that market participants act in their economic best interest."

Assumptions underlying the estimates of future cash flows under IFRS 17 would be adjusted when the entity's view differs from the market participants' view. As stated before, the market participants' view is anticipated to be the same as the entity's view for most assumptions because the entity has already used the relevant information available to determine the estimates of future cash flows. However, adjustments would be expected when the assumptions used are unique to the specific circumstances of an entity that would not be relevant to market participants (see Section 4.1.2 for examples). When determining estimates of future cash flows for measurement of insurance contracts at transition, reasonable and supportable information available at that date would be used without undue cost or effort.

4.1.2. Assumptions considered in IFRS 17 that may need to be adjusted

Assumptions considered in IFRS 17 that may need to be adjusted to assume the market view in a fair value measurement under IFRS 13 include but are not limited to:

- the benefit of diversification or expense synergies;
- circumstances where an entity has taken a specific view on an aspect of the insurance contract measurement that may diverge from the broader industry view (e.g., future mortality improvement);
- an assumption weighted for credibility (e.g., will the market participant need to use the industry assumption or have a different view if industry experience is limited?);
- contract administration expenses unduly high (e.g., due to significant system development costs).

4.1.3. Adjustments for cash flows not considered in IFRS 17

Adjustments to consider in the calculation of the estimates of future cash flows at transition under a fair value approach which are not considered under IFRS 17 could include but are not limited to:

- adjustments to expenses to include general expenses which are not directly attributable to the insurance contracts per IFRS 17.B65; and
- adjustments to include deferred tax timing adjustments and other income taxes differences (e.g., different tax profile).

Regarding expenses, it could be reasonable to assume that the entity's assumption represents a market participant level of expenses if the entities share similar characteristics with the market participants (e.g., similar size). An example of when the entity's own expenses might be significantly higher than for a market participant and thus require an adjustment would be for a new company where there is an expense gap (e.g., high level of overheads and low number of policies).

4.2. Risk adjustment for non-financial risk and risks not covered in the fulfilment cash flows

4.2.1. General considerations

The concept of the risk premium in IFRS 13 is similar to the concept of the risk adjustment for non-financial risk in IFRS 17 as discussed below:

> "Method 1 of the expected present value technique adjusts the expected cash flows of an asset for systematic (i.e. market) risk by subtracting a cash risk premium (i.e. risk-adjusted expected cash flows). Those risk-adjusted expected cash flows represent a certainty-equivalent cash flow, which is discounted at a risk-free interest rate. A certainty-equivalent cash flow refers to an expected cash flow (as defined), adjusted for risk so that a market participant is indifferent to trading a certain cash flow for an expected cash flow. For example, if a market participant was willing to trade an expected cash flow of CU1,200 for a certain cash flow of CU1,000, the CU1,000 is the certainty equivalent of the CU1,200 (ie the CU200 would represent the cash risk premium). In that case the market participant would be indifferent as to the asset held." (IFRS 13.B25)

> "For example, the risk adjustment for non-financial risk would measure the compensation the entity would require to make it indifferent between fulfilling a liability that—because of non-financial risk—has a 50 per cent probability of being CU90 and a 50 per cent probability of being CU110, and fulfilling a liability that is fixed at CU100." (IFRS 17.B87)

One difference between IFRS 13 and IFRS 17 is that the risk adjustment used in the fair value measurement would consider the risk adjustment from the view of a market participant (IFRS 13) and not from the entity's view (IFRS 17).

Another difference between IFRS 13 and IFRS 17 is that IFRS 17 doesn't require provision on all risks, whereas IFRS 13 would require a risk premium to include all risks that a market participant would need to be compensated for. The risk adjustment would therefore be increased to include the cost of capital for risks not covered in the fulfilment cash flows (e.g., operational risks, asset-liability mismatch risk).

For risks that are covered in IFRS 17, differences in assumptions between IFRS 13 and IFRS 17 may impact the level of the risk premium. For example:

- target capital ratio, if different than the entity's target capital ratio to the extent that it impacts the level of RA;
- cost of capital rate, if different than the entity's cost of capital rate;
- degree of risk aversion, if the market view is different from the entity's view;

- degree of diversification benefit, if the market view is different from the entity's view; and
- use of a different capital framework, if any (e.g. internal vs standard formula).

4.2.2.Target capital ratio

The basis for determining capital requirements is usually jurisdiction-specific and therefore the starting point for determining capital would be unique to the jurisdiction in which the block of business being valued is located.

For a group of Canadian contracts being fair valued, it is reasonable to assume that the capital basis would be the Canadian regulatory capital framework (i.e., LICAT/CARLI or MCT).

There are different levels of capital ratios defined in OSFI's *Regulatory Capital and Internal Capital Targets* guideline:

- **Minimum capital**: "The minimum levels of capital necessary for an insurer to cover the risks specified in the Capital Guidelines."
  - **LICAT/CARLI: Total = 90% / Core = 55%**
  - **MCT (Federal): 100%**
- **Supervisory target capital**: "The target levels of capital necessary for an insurer to cover the risks specified in the Capital Guidelines as well as to provide a margin for other risks."
  - **LICAT/CARLI: Total = 100% / Core = 70%**
  - **MCT (Federal): 150%**
- **Internal targets:** "The target levels of capital, determined as part of an insurer's ORSA, needed to cover all the risks of the insurer, including the risks specified in the Capital Guidelines."
  - **LICAT/CARLI: Total > 100% / Core > 70%**
  - **MCT (Federal): > 150%**

AMF also has a similar *Capital Management Guideline*.

Insurers are expected to operate at capital levels above the internal targets and it represent a lower bound for fair value measurement. Thus, if using the Canadian regulatory capital framework (i.e., LICAT/CARLI, MCT, etc.), the target capital used for the capital projections would be:

- **LICAT/CARLI: [Target x BSB] – SA – ED – CSM**
- **MCT: Target x MCR**

Where :

- **Target :** Market participants' internal target capital ratio
- **BSB :** Base solvency buffer

- **SA :** Surplus allowance
- **ED :** Eligible deposits
- **CSM :** Contractual service margin
- **MCR :** Minimum capital required

A starting point to determine the market participants' internal target capital ratio could be to use the entity's assumption used for other similar activities, such as pricing, and make adjustments if necessary (e.g., if the entity's internal target ratio is not consistent with the market view). Moreover, for OSFI regulated companies, overall LICAT or MCT ratios are public, which could be another source of information with some caveats (e.g., companies may operate with excess capital and this excess capital may not be relevant to the fair value measurement).

The use of an internal capital basis could also be appropriate if reasonably representative of a market participant's requirements.

4.2.3. Cost of capital rate

The cost of capital rate (r_t) represents the compensation that the market participant requires for holding the required capital. This is usually the WACC minus the after-tax rate earned on assets supporting the required capital or surplus.

Weighted average cost of capital rate

The WACC is defined as follows: "The cost of capital (discount rate) determined by the weighted average, at market value, of the cost of all financing sources in the business enterprise's capital structure[15]."

The typical formula to calculate the WACC is provided below:

$$WACC = \frac{E}{V} \times R_e + \frac{D}{V} \times R_d \times (1 - T_c)$$

Where:

- R_e = Cost of equity
- R_d = Cost of debt
- E = Market value of the firm's equity
- D = Market value of the firm's debt
- V = E + D = Total market value of the firm's financing
- E/V = Percentage of financing that is equity
- D/V = Percentage of financing that is debt
- T_c = Corporate tax rate

The cost of equity could be estimated using the Capital Asset Pricing Model (CAPM) or the Fama-French models. In Canada, a starting point could be to equate the cost of equity to the ROE targets of a market participant, as this is frequently used as the basis (or part of) for assessing projects and transactions. However, some adjustments to the ROE targets of a market participant might be required when calculating the fair value of different blocks of business. For

[15] Catty, J. P. (2010). Guide to fair value under IFRS. Wiley.

example, some adjustments could be made for the type of risk (e.g., market risk, interest risk, mortality risk), the size of the block of business being fair valued or other factors (e.g., market expectations). The actuary would compare, if possible, the cost of equity of the block of business being fair valued with those of other insurance companies (public) and look at recent transactions.

The cost of debt is more straightforward, as it would be the market rate that the market participant will pay on its debts. This cost of debt would take into account the credit risk of the market participant.

The corporate tax rate would be based on the expected tax rate of the market participant.

Finally, to calculate the WACC, the actuary could consider whether it is reasonable to use a methodology that generates consistent weights between debt and equity through time. These weights could be based on the long-term capital structure of the market participant.

Expected return on assets supporting the required capital

The expected return on the required capital would be a weighted average of the expected returns of the assets backing the required capital of the market participant. The weights could be based on the long-term invested asset mix backing the required capital of the market participant.

4.2.4. Degree of risk aversion

As stated in Section 4.2.1, another source of difference between IFRS 13 and IFRS 17 risk adjustment could arise if the entity's view of risk aversion is assessed to be outside the range of what the general market view would be.

4.2.5. Degree of diversification benefit

Under IFRS 13 and IFRS 17, what is being valued is a group of contracts, not a line of business or company.

IFRS 17.B88 states:

> "the risk adjustment for non-financial risk also reflects:
>
> a) the degree of diversification benefit the entity includes when determining the compensation it requires for bearing that risk;"

which means that the entity may consider diversification benefits for within risks diversification and between risks diversification when assessing the risk adjustment for non-financial risk. In other words, even if the risk adjustment for non-financial risk is measured for a specific group of contracts (e.g., life insurance), an entity would generally consider the diversification with other portfolios of the entity (e.g. annuities) to reflect the compensation required to bear the non diversifiable risk from its point of view.

IFRS 13.B24 states:

> "[…] risk-averse market participants would take into account the risk that the actual cash flows may differ from the expected cash flows. […]

a) unsystematic (diversifiable) risk, which is the risk specific to a particular asset or liability.

[…] Portfolio theory holds that in a market in equilibrium, market participants will be compensated only for bearing the systematic risk inherent in the cash flows."

This means that diversifiable risk would not be compensated and that no risk premium would be required for a diversifiable risk.

Similar to the risk adjustment for non-financial risk, even if the risk premium is valued at the group of contracts level (e.g., life insurance), market participants would also generally consider the diversification with other portfolios of the market participants (e.g., annuities) to determine the level of risk premium to reflect the compensation required to bear the non diversifiable risk from its point of view.

Both IFRS 17 and IFRS 13 give similar guidance relating to the consideration of diversification in the valuation. The main difference is that IFRS 17 is from the entity's point of view whereas IFRS 13 is from the market participant's point of view.

Generally speaking, larger organizations benefit from greater diversification than smaller ones both for the within risks diversification and between risks diversification. An adjustment to the diversification benefit could be needed if the market participant has a different size than the entity. One way to do this could be to look at the ratio of the "Diversification credit" and the "Capital Requirements Before Diversification" in the LICAT of a company with a similar size to the market participant and compare it to the ratio of the entity.

An adjustment could also be needed if the entity does not consider or partially considers diversification to set its risk adjustment for non-financial risk. It would generally be considered by a market participant, especially since IFRS 13.16 refers to the most advantageous market when there is no principal market.

4.2.6. Cost of capital for risks not covered in the fulfilment cash flows

Under the assumption that market participants will likely be subject to the jurisdiction/regulatory framework of the country of domicile (i.e., Canada), it is reasonable to assume that the capital basis would be the Canadian regulatory capital framework (i.e. LICAT/CARLI or MCT) and thus could be used as a basis to expand the list of risks covered in the IFRS 17 fulfilment cash flows so that all risks are covered in the cost of capital.

The Canadian regulatory capital framework (i.e., LICAT/CARLI or MCT) covers the following risks:

- credit risk (on and off-balance sheet activities);
- market risk (interest rate risk, equity risk, real estate risk, etc.);
- insurance risk;
- segregated fund risk (only in LICAT/CARLI);
- operational risk.

Credit risk and market risk (other than interest rate risk)

As stated in question 10.6 of the educational note, *Application of IFRS 17 Insurance Contracts*, the fair value of insurance contracts under IFRS 17 would ignore supporting assets. This implies that the risks that are not directly related to the insurance contracts (e.g., asset default risk, equity risk) would be excluded when determining the required capital.

In practice, there are two options with respect to the treatment of assets backing liabilities and capital in the calculation of fair value that aim to achieve similar results, which are discussed below. Both options represent valid interpretations of question 10.6 and are acceptable for fair value calculations. It should be noted that, for the sake of the discussion, credit/market risk and other financial risks that could lead to other adjustments are ignored (e.g., misestimation/level risk of any unobservable period input).

Option 1: Exclude the cost of the capital on supporting assets (e.g., asset default risk, equity risk) and assume the assets earned a rate that fully covers the interest expense on the liability.

Option 2: Include the expected asset earned rate in the fair value calculations and maintain the associated cost of capital on the assets (e.g., asset default risk and equity risk).

Option 1 and Option 2 would produce similar results when the additional spread earned on the assets (above the interest expense of the liabilities, which consists of the risk-free rate plus an illiquidity premium) is equal to the cost of capital generated by those assets. In practice, this equilibrium might not always be true, and some judgment might be necessary in order to avoid creating an unwarranted positive/negative bias on the fair value by choosing one option versus the other.

An illustration of IFRS 13 adjustments for financial assumptions (discount rate and risks) with regards to the IFRS 17 discount curve and asset returns is provided in Appendix B.

Market risk – Interest rate risk

As stated in question 10.5 of the educational note, *Application of IFRS 17 Insurance Contracts*, the risk adjustment is increased to include the cost of capital on risks not covered in the fulfilment cash flows, including non-observable financial risks.

For insurance contract liabilities with long term cash flows, it is impossible to achieve perfect asset/liability matching (ALM). While asset/liability mismatch risk includes characteristics of the assets, it is appropriate to assume that a market participant would consider ALM risk, especially for the non-observable part of the curve, when determining the compensation required. Therefore, asset/liability mismatch risk would be included when estimating the fair value of the liabilities.

A starting point to estimate the compensation required for asset/liability mismatch risk could be the interest rate risk formula in LICAT/CARLI or MCT, adjusted to account for other financial risks.

An adjustment over LICAT/CARLI or MCT interest rate risk could be to provide for the misestimation/level risk of any unobservable input. In fact, as per paragraph IFRS 17.B78, the entity is required to estimate appropriate rates when such rates are not directly observable in the market, while maximizing the use of observable inputs. For instance, this leads to the

determination of the unobservable part of the discount rate curve. IFRS 13.88 refers to the necessity, in a fair value measurement, to include a risk adjustment when there is significant measurement uncertainty in determining the liability unobservable inputs.

Another adjustment could be to provide for the risk of not being able to achieve the illiquidity premium included in the IFRS 17 liability discount curve. In fact, as per paragraph IFRS 17.36, the discount curve needs to reflect the liquidity characteristics of the insurance contracts, which can be different than the illiquidity premium that a market participant can earn on their assets to fulfil the insurance contracts. Some potential adjustments could be reasonable if the reference portfolio used to derive the illiquidity premium of the IFRS 17 discount curve is different than the market participant's assets (top-down approach), or if the IFRS 17 discount curve was derived using a bottom-up approach and thus creating a potential de-linkage of assets and liabilities

Insurance risks

These risks are already implicitly included in the IFRS 17 fulfilment cash flows through the risk adjustment for non-financial risks and are discussed in previous sections (4.2.2 to 4.2.5). As a result, no additional adjustment would need to be made to the FCF with respect to the insurance risks.

Segregated fund risk and other financial risks (options and guarantees)

These risks are discussed in Section 5.1.1.

Operational risk

This risk is not included in the IFRS 17 fulfilment cash flows and a market participant would require compensation to cover the cost of capital for this risk. Thus, the LICAT/CARLI or MCT operational risk, subject to some adjustments, would need to be included when estimating the fair value of the liabilities.

Moreover, some adjustments to include additional risks not covered by LICAT/CARLI or MCT could be appropriate. However, the actuary would avoid double counting these adjustments, as some may already be implicitly included in the market participant's internal target capital ratio (LICAT/CARLI > 100% and MCT > 150%). Some examples are provided below.

Other risks

There could be other risks for which a market participant would require compensation and thus would need to be included in the fair value measurement. Some examples are risks that are not otherwise fully captured (e.g., concentration risks) and/or not explicitly captured (e.g., reputational risk, strategic risk, model risk) in the IFRS 17 FCF.

4.3. Discount rates

Discussions in this section are only relevant under the adjusted fulfilment cash flows approach and in the context of potential adjustments to the discount rate to reflect the perspective of a market participant (IFRS 13) rather than the entity's view (IFRS 17). Other IFRS 13 requirements such as compensation required for financial risks (e.g., non-observable period) are discussed in Section 4.2.

4.3.1. General considerations

In order to use a present value technique to measure the fair value, the actuary will need to define appropriate discount rates from the perspective of a market participant.

As stated in IFRS 13.B13, the fair value estimated using a present value technique would reflect, "the time value of money, represented by the rate on risk-free monetary assets that have maturity dates or durations that coincide with the period covered by the cash flows and pose neither uncertainty in timing nor risk of default to the holder (i.e. a risk-free interest rate)."

Moreover, IFRS 13.B14 describes general principles that govern all present value techniques:

a) Cash flows and discount rates should reflect assumptions that market participants would use when pricing the asset or liability.

b) Cash flows and discount rates should take into account only the factors attributable to the asset or liability being measured.

c) To avoid double-counting or omitting the effects of risk factors, discount rates should reflect assumptions that are consistent with those inherent in the cash flows. For example, a discount rate that reflects the uncertainty in expectations about future defaults is appropriate if using contractual cash flows of a loan (i.e. a discount rate adjustment technique). That same rate should not be used if using expected (i.e. probability-weighted) cash flows (i.e. an expected present value technique) because the expected cash flows already reflect assumptions about the uncertainty in future defaults; instead, a discount rate that is commensurate with the risk inherent in the expected cash flows should be used.

d) Assumptions about cash flows and discount rates should be internally consistent. For example, nominal cash flows, which include the effect of inflation, should be discounted at a rate that includes the effect of inflation. The nominal risk-free interest rate includes the effect of inflation. Real cash flows, which exclude the effect of inflation, should be discounted at a rate that excludes the effect of inflation. Similarly, after-tax cash flows should be discounted using an after-tax discount rate. Pre-tax cash flows should be discounted at a rate consistent with those cash flows.

e) Discount rates should be consistent with the underlying economic factors of the currency in which the cash flows are denominated.

These concepts are very similar to the discount rates applied to the estimates of future cash flows under IFRS 17, which are described in IFRS 17.36:

a) reflect the time value of money, the characteristics of the cash flows and the liquidity characteristics of the insurance contracts;

b) be consistent with observable current market prices (if any) for financial instruments with cash flows whose characteristics are consistent with those of the insurance contracts, in terms of, for example, timing, currency and liquidity; and

c) exclude the effect of factors that influence such observable market prices but do not affect the future cash flows of the insurance contracts.

IFRS 17.B74 provides further guidance when cash flows vary based on the returns on any financial underlying items:

> Estimates of discount rates shall be consistent with other estimates used to measure insurance contracts to avoid double counting or omissions; for example:
>
> a) cashflows that do not vary based on the returns on any underlying items shall be discounted at rates that do not reflect any such variability;
>
> b) cashflows that vary based on the returns on any financial underlying items shall be:
>
> i. discounted using rates that reflect that variability; or
>
> ii. adjusted for the effect of that variability and discounted at a rate that reflects the adjustment made…

Further considerations are provided in IFRS 17.B72–B85 and in the educational notes, *IFRS 17 Discount Rates for Life and Health Insurance Contracts* and *IFRS 17 Discount Rates and Cash Flow Considerations for Property and Casualty Insurance Contracts*.

In summary, the discount rates used in IFRS 13 would reflect the assumptions that market participants would use when pricing the insurance liabilities and be consistent with the characteristics of the liabilities, such as the duration or currency and pose neither uncertainty in timing nor risk of default to the holder. On that basis, the IFRS 13 discount rates would only include two components: risk-free rates and illiquidity premiums.

An illustration of IFRS 13 adjustments for financial assumptions (discount rates and risks) with regards to the IFRS 17 discount curve and assets return is provided in Appendix B.

4.3.2. Adjustment to the IFRS 17 risk-free rates

Risk-free rates under IFRS 17 are market consistent and thus no adjustment is expected to be made to reflect the perspective of a market participant unless justified by facts or circumstances (e.g., entity is aware that their view on the ultimate risk-free rate is materially different from their peers').

4.3.3. Adjustment to the IFRS 17 illiquidity premium

Similar to risk-free rates, illiquidity premiums under IFRS 17 are assumed to be market consistent.

The liquidity characteristics of the underlying insurance contracts are the same for the market participant as for the entity. The entity's illiquidity premium (as required by IFRS 17) is consistent with those characteristics, and therefore need not be adjusted unless there is reason to believe that the illiquidity premium set by a market participant would be different.

4.4. Other adjustments

4.4.1. Entity's own credit risk

Credit risk is defined in IFRS 7 as, "The risk that one party to a financial instrument will cause a financial loss for the other party by failing to discharge an obligation."

IFRS 17 clearly specifies that the non-performance risk of the entity is not included in IFRS 17 fulfilment cash flows, as stated in IFRS 17.31: "In the financial statements of an entity that issues insurance contracts, the fulfilment cash flows shall not reflect the non-performance risk of that entity (non-performance risk is defined in IFRS 13 Fair Value Measurement)."

IFRS 13 requires that the fair value reflect the non-performance risk relating to the liability, including the entity's (i.e., the obligor's) own credit risk, as stated in IFRS 13.B13f and IFRS 13.42:

> "A fair value measurement of an asset or a liability using a present value technique captures all the following elements […]
>
> f) for a liability, the non-performance risk relating to that liability, including the entity's (ie the obligor's) own credit risk"
>
> "The fair value of a liability reflects the effect of non-performance risk. Non-performance risk includes, but may not be limited to, an entity's own credit risk (as defined in IFRS 7 *Financial Instruments: Disclosures*). Non-performance risk is assumed to be the same before and after the transfer of the liability."

This adjustment, if any, is expected to decrease the fair value (and thus the CSM at transition). However, in Canada, this adjustment is expected to be smaller than typical assets (e.g., bonds) or liabilities (e.g., debentures), because policy-holders' claims take priority over all other creditors. Moreover, insurance companies are regulated by OSFI and AMF and need to hold capital to cover losses that could occur under an adverse scenario (e.g., for life insurance companies, the LICAT base solvency buffer corresponds to a CTE (99) over one year, i.e., the average loss that can occur in the worst 1% of cases). In the context of the Canadian regulatory regime, this adjustment is expected to be small for well capitalized companies and may not be material for fair value measurement.

The next sections will present only two alternatives to estimate the non-performance risk of the entity, although there could be other possible methodologies (e.g., credit default swaps).

<u>IFRS 17 reinsurance contracts held approach</u>

Although IFRS 17 excludes the non-performance risk of the entity from the fulfilment cash flows, a similar concept exists for reinsurance contracts held, as stated in IFRS 17.63: "*[…]* In addition, the entity shall include in the estimates of the present value of the future cash flows for the group of reinsurance contracts held the effect of any risk of non-performance by the issuer of the reinsurance contract, including the effects of collateral and losses from disputes."

Using this concept, one could estimate the non-performance risk by projecting the probability of default (PD) for each year and multiplying it by the loss given default (LGD):

$$\text{Non} - \text{performance risk} = \sum_{t=0}^{100} (1 - \text{PD})^t \times \text{PD} \times \text{LGD} \times \text{Discount}_t$$

Where:

- $Discount_t$ represents the discount factor to discount the cash flows from year t to the valuation date. The discount rates would be the same as those used to value the IFRS 13 liabilities (see Section 4.3).
- *PD* and *LGD* would take into account both the risk that the entity will not be able to meet its contractual commitments and the risk of litigation with the latter.

Defaults of life insurers are rare in Canada so it might not be appropriate to rely on those statistics to make assumptions related to the PD and LGD. Moreover, the credit rating of the entity may not be an appropriate rating to use since it represents the ability of the entity to honor its commitments to its creditors and not to its customers. This being said, the risks associated with the reinsurer's non-performance (including both the risk of default and the risk of litigation) are assessed in the capital guidelines (LICAT/CARLI), which can serve as a basis for determining PD and LGD for the entity.

Cost of capital approach

An argument could be made that the risk of non-performance is already included in the entity's cost of capital, through the hurdle rate/WACC. It is reasonable to assume that an entity having a higher credit risk would require either a higher return on equity (cost of equity) or would be subject to an increase in its cost of debt.

Thus, an adjustment would only be required in the case where the credit risk profile of the "obligor" is different than the credit risk profile of a market participant, since the non-performance risk is based on the entity and not from a market perspective. In general (e.g., normal market conditions, company in good financial situation), this adjustment is not expected to be significant and thus the use of the market participant assumptions would be appropriate, and an adjustment would only be required in some specific cases (e.g., company in poor financial condition).

4.4.2. Profit margin

As stated in question 10.5 of the educational note, *Application of IFRS 17 Insurance Contracts*, the fair value is adjusted to reflect the return that a market participant would require for undertaking the activity (see paragraphs 41 and B31 of IFRS 13), which may be interpreted to include profit margins that a market participant would require for providing coverage and other service fees attached to the group of contracts.

An overriding principle in IFRS 13 is that market information should be taken into account, such as any evidence that buyers do require this profit margin. However, the use a of profit margin is subjective and we might argue that there is a basket of other items a buyer could demand in lieu of a pure profit margin, such as an additional return requirement (e.g., higher hurdle rate) or additional cost of capital requirement (e.g., higher target capital, risk not covered in the fulfilment cash flows). For these reasons, no additional adjustments to the fair value would be expected other than those already described in Sections 4.1 to 4.3.

The use of an adjustment for a pure profit margin (such as a profit add on) could still be appropriate, but simply as an approximation to adjustments discussed in previous sections.

5. Other considerations

This section will discuss various other considerations regarding the fair value of insurance contracts, such as:

- considerations for products with financial guarantees, such as segregated funds (Section 5.1);
- considerations for reinsurance contracts held (Section 5.2);
- level of aggregation (Section 5.3);
- potential financial implications of selecting the fair value approach (Section 5.4).

5.1. Considerations for products with financial guarantees

The guidance and principles discussed in previous sections are general and would also apply for products with financial guarantees, such as segregated funds. In other words, an entity would need to follow the same approach for these products as any other group of insurance contracts being fair valued, such as:

- identify a profile of a hypothetical market participant;
- consider whether its current assumptions would differ from that of the market participant; and
- make the necessary adjustments as per IFRS 13.B13 and discussed in Section 4.

Segregated funds and other financial options and guarantees

Market participant

As stated in Section 3.2, the type of business is one key factor when determining the market participant for the group of insurance contracts being fair valued. One example would be products that are not sold broadly by every insurer, such as segregated funds. Therefore, it may be appropriate for an entity to identity a profile of market participants for its segregated funds business that is different from other types of products.

Assumptions of a market participant

Assumptions considered in IFRS 17 that may need to be adjusted
A good starting point in order to determine the assumptions of a market participant would be the educational note, *Market Consistent Valuation of Financial Guarantees for Life and Health Insurance Contracts*.

As described in Section 4, it would be reasonable to assume that the entity's own assumptions are appropriate for the fair value measurement. An example where an adjustment may be required is when the entity has taken a specific view on an aspect of the IFRS valuation and is aware that it may diverge from the view of expected market participants.

The following is a non-exhaustive list of potential adjustments: expenses synergies, a more conservative/aggressive view on policy-holder behavior, a different view on volatility (e.g., ultimate long-term equity volatility assumption), etc.

Adjustment for cash flows not considered in IFRS 17
Similar to Section 4.1.3, cash flows that are not directly included in the IFRS 17 fulfilment cash flows (e.g., non-attributable expenses) would need to be included in the fair value calculation.

Risk adjustment for non-financial risk and risks not covered in the fulfilment cash flows
As discussed in Section 4.2, some potential adjustments might be required if the market participants have a different view on risk aversion or diversification benefits than the entity.

It should be noted that at the time this educational note was written, there was still uncertainty regarding the capital basis due to upcoming changes to LICAT/CARLI under IFRS 17. This is especially true for segregated funds where there are potentially significant changes to the capital formula being considered (see "New Approach for Determining Regulatory Capital Requirements for Segregated Fund Guarantee (SFG) Risk" for additional context). However, the market participant will still reasonably demand a cost of capital charge. In other words, although the capital formula is a moving target, the entity will need to make an assumption about what a market participant would require based on the best available information at a particular date.

Potential approximations

Given the nature of these products and their inherent risk asymmetries (which requires stochastic calculations), it could prove to be relatively complex to perform the required calculations to estimate the fair value. For example, a traditional appraisal value approach which requires cost of capital and future profits to be explicitly modelled could be too complex for calculating the fair value because of the need to perform a stochastic-on-stochastic type projection (e.g., capital and liabilities would require stochastic re-valuation throughout the projection scenario).

Discussions below provide two potential approximations for the fair value calculations, although other approximations could also be acceptable. As always, approximations are not appropriate in every circumstance and thus the actuary would need to use caution in using any of the approximations discussed.

Approximation 1 – CSM = Cost of residual risks (inefficiencies) + Cost of residual capital requirement not included in RA + Cash flows not directly included in FCF

It is common practice to rely on market consistent valuation techniques to value segregated fund guarantees and other financial options and guarantees. Market consistent valuation techniques reproduce the price of hedging instruments that mimic the guarantee profile, with appropriate adjustments to reflect the differences in these hedging instruments/assets and the liability characteristics. In situations where the hedging instruments/assets would mimic perfectly the guarantee characteristics, one could assume that the fair value of the guarantee would correspond exactly to the market consistent valuation of the liability.

To value the fair value of the entire segregated fund contract, one could extend the market consistent valuation to the other varying parts of the contract (e.g., entity's share). As it is impossible to perfectly hedge segregated fund cash flows with market instruments, the fair value is expected to differ from the fulfilment cash flows. In fact, the fair value would, for example, need to take into account the cost of the residual risk (e.g., hedge ineffectiveness) and/or the

cost of any residual capital requirements. Another difference could come from any cash flows that are not directly included in the fulfilment cash flows (e.g., non-attributable expenses). This is consistent with other products.

It is important to note that the market consistent valuation of segregated fund guarantees would remain the same, regardless of whether or not the entity is hedging the guarantees. This means that the fair value calculation would be the same/similar. For example, a fair value calculation excluding the reflection of hedging would have a higher cost of residual capital requirements than the fair value calculation including the reflection of hedging.

Approximation 2 – Real world valuation without financial/insurance margins (outer loop) that take into account hedging program (inner loop) + cost of capital

Under this approximation, the market participant would start with a real-world stochastic valuation (outer loop), including a risk-neutral stochastic valuation (inner loop) to reflect the impact of hedging, and then make the following adjustments:

- exclude the insurance margin (best estimate assumption only);
- exclude the financial margin (therefore, equivalent to CTE 0); and
- adjust for some limitations of the valuation (e.g., renewals or future deposits).

This represents the best estimate liability, without considering the cost of capital.

The next step would be to add the cost of capital of a market participant:

- Determine the WACC/hurdle rate and target capital ratio.
- Calculate the risk related to segregated funds (LICAT/CARLI - Chapter 7), or other financial options and guarantees, and operational risk.
- Adjust the required capital based on the scalar and other adjustments (if any).

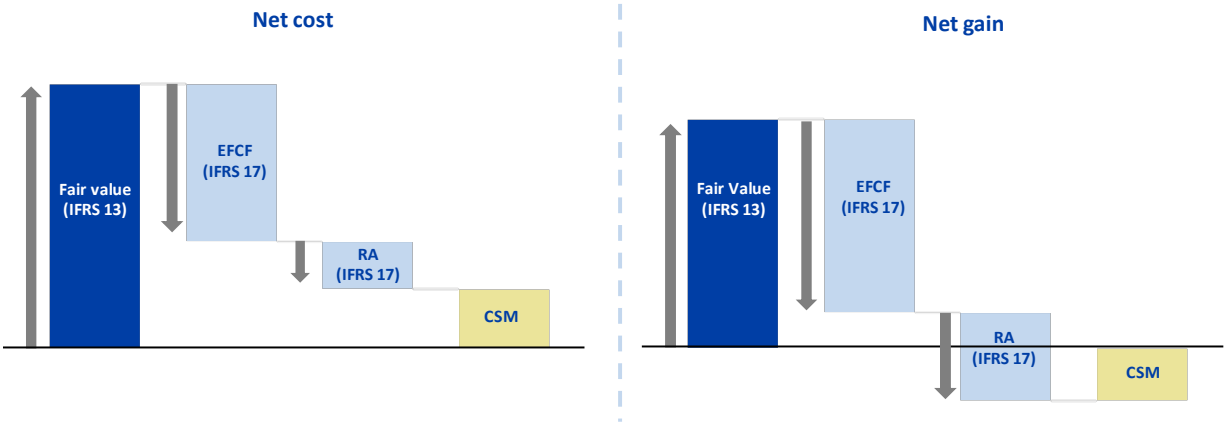
The cost of capital could be projected using approximations. One possible approximation would be to use the ratio between the market value of the contracts and the required capital at the transition date and to apply the same ratio to the market value projected by the valuation model.

5.2. Considerations for reinsurance contracts held

The guidance and principles discussed in previous sections are general and also apply for reinsurance contracts held. The next sections will discuss specific considerations regarding the fair value of reinsurance contracts held.

5.2.1.CSM at transition

As stated in IFRS 17.61, one difference from direct contracts is that reinsurance contracts held can not be onerous, and thus the CSM balance would either be positive or negative (net cost or net gain), as illustrated below.



The above illustration does not reflect the situation where the underlying contract is onerous and thus would require a loss-recovery component to be determined at transition as per IFRS 17.B95B. Although it is technically possible for a group of underlying insurance contracts to be onerous at transition, and thus resulting in a loss component (underlying) and loss-recovery component (reinsurance), it is not expected for the vast majority of the block of business being fair valued.

5.2.2. Market participant

As stated in question 10.9 of the educational note, *Application of IFRS 17 Insurance Contracts*: "The market for reinsurance contracts held would be related to the market for the contracts that are reinsured, as transactions involving reinsurance contracts held are usually part of transactions involving the reinsured contracts."

With regards to the above, it is expected that the market participants for reinsurance contracts held would be the same as those for the underlying contracts. As in most mergers and acquisitions, the potential buyer of a block of business would acquire both the direct contracts and the reinsurance contracts held.

With that perspective, the fair value for a group of reinsurance contracts held could be seen as the amount that would bring the fair value of the direct contracts without reinsurance to the net fair value of the underlying contracts including the reinsurance:

FV (Reinsurance contracts held)
=
FV (Direct contracts without reinsurance) – FV (Direct contracts with reinsurance)

Although the approach above describe above is reasonable to estimate the fair value on reinsurance contract held, the actuary would need to ensure that resulting fair values (direct contracts and reinsurance contracts held) are reasonably and appropriately determined relative to one another and relative to the requirements of the standard.

5.2.3. Non-performance risk

IFRS 17 fulfilment cash flows for reinsurance contracts held already reflect the non-performance risk by the issuer of the reinsurance contract, as stated in IFRS 17.63: "[…] In addition, the entity

shall include in the estimates of the present value of the future cash flows for the group of reinsurance contracts held the effect of any risk of non-performance by the issuer of the reinsurance contract, including the effects of collateral and losses from disputes.*"*

For this reason, no adjustments for non-performance risk over the IFRS 17 fulfilment cash flows are typically required when calculating the fair value of reinsurance contracts held.

5.3. Level of aggregation

IFRS 13 does not provide any guidance as to the unit of account when estimating the fair value of a block of business, but rather relies on other IFRS as stated in IFRS 13.14: " […] The unit of account for the asset or liability shall be determined in accordance with the IFRS that requires or permits the fair value measurement, except as provided in this IFRS.*"*

Under IFRS 17, the unit of account when applying the fair value approach is the group of insurance contracts as stated in IFRS 17.C20:

> *"*To apply the fair value approach, an entity shall determine the contractual service margin or loss component of the liability for remaining coverage at the transition date as the difference between the fair value of a group of insurance contracts at that date and the fulfilment cash flows measured at that date."

Furthermore, the group of insurance contracts are defined in paragraphs IFRS 17.14 to IFRS 17.24. When applying the fair value approach, an entity is not required to apply paragraph IFRS 17.22 and may include contracts issued more than one year apart (see IFRS 17.C23) in the same group. However, an entity may choose to determine groups of contracts using IFRS 17.C22:

a) reasonable and supportable information for what the entity would have determined given the terms of the contract and the market conditions at the date of inception or initial recognition, as appropriate; or

b) reasonable and supportable information available at the transition date.

In practice, the calculation of the fair value at the group level may prove to be a challenging endeavor in some circumstances. One potential challenge could be that some fair value assumptions might not be reliable at the group level. One possible alternative could be to calculate the fair value at a higher level (e.g., portfolio level.) and to allocate the CSM to groups of insurance contracts using reasonable and supportable information. Judgment may be required to ensure that the CSM allocated to each group is appropriate.

5.4. Potential financial implications of selecting the fair value approach

If the full retrospective approach is impracticable, the entity will have to choose between two alternative approaches: the modified retrospective approach (MRA) (if there is reasonable and supportable information to estimate it) or the fair value approach (FVA). The actuary would be aware of the differences in objectives and calculation frameworks between the MRA and FVA approaches, as they could lead to different CSM measurements at transition.

For example, under the fair value approach, the CSM at transition will reflect the margin that a market participant requires for taking over the block of business. On the other hand, the CSM at transition under the modified retrospective approach will reflect the unamortized CSM not yet

recognised in profits. This is also noted in papers issued by the European Financial Reporting Advisory Group (EFRAG)[16]: *"*The range of fair values is likely to be much narrower than under the FRA, with a buyer unlikely to take on business on onerous terms and a seller being unlikely to sell business on terms that are too attractive to a buyer. Thus, the CSM on a fair value basis is likely to be higher than under a FRA in many circumstances and lower than under a FRA in many other circumstances.*"*

[16] EFRAG Paper 09-12: Meeting 22-23 May 2019
https://www.efrag.org/Assets/Download?assetUrl=%2Fsites%2Fwebpublishing%2FMeeting%20Documents%2F1904050854507613%2F09-12%20Fair%20value%20at%20transition%20TEG%2019-05-22.pdf

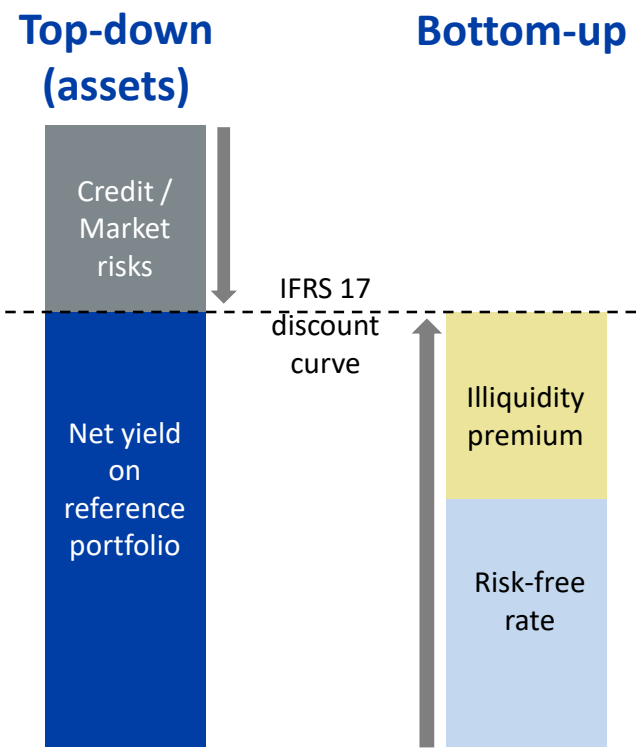
Appendix A – Example on how to model some adjustments from Section 4

Below are some examples on how to model some adjustments from Section 4 under both the adjusted fulfilment cash flows approach and appraisal value approach. Note that these are only examples in order to help the reader have a better understanding as to how each model could be adjusted, and that there are many other ways to model each adjustment.

Section	Assumption	Adjusted FCF	Appraisal value
Section 4.1.2 – Assumptions considered under IFRS 17 that may need to be adjusted	Expenses – Synergies / diversification	Gross-up/down the attributable expense unit cost assumption by X% in order to reflect the synergies/diversification benefits	Adjust "actual" expense cash flows to reflect diversification benefit/synergies No change to "expected" cash flows (IFRS 17 FCF) Gain & Loss (G&L) discounted using the WACC
Section 4.1.3 – Adjustment for cash flows not considered under IFRS 17	Expenses – Non-attributable expenses	Gross-up the attributable expense unit cost assumption by X% in order to include the non-attributable expense	Add an additional expense cash flow (other income and expense) No change to "expected" cash flows (IFRS 17 FCF) G&L discounted using the WACC
Section 4.2.4 – Degree of risk aversion	Risk adjustment	Determine the RA with the confidence level of a market participant (e.g., 75% vs. 85%)	Adjust the hurdle rate/WACC in order to reflect the market participant's view (e.g., 10% vs. 12%)
Section 4.2.5 – Degree of risk diversification benefit	Risk adjustment	Determine the RA with the same confidence level, use a diversification factor adjusted to reflect the market participant's view	Calculate the cost of capital with LICAT (base solvency buffer) and the maximum diversification benefit from LICAT
Section 4.2.6 – Cost of capital for risks not covered in the FCF	Market risk – Interest rate risk (misestimation/level risk)	Ultimate rate in the IFRS 17 discount rates could be adjusted	Recalculate the FCF at each time step reflecting the expected economic environment (<> IFRS 17 discount rate)
Section 4.2.6 – Cost of capital for risks not covered in the FCF	Operational risk	Simple add-on of LICAT/CARLI operational risk or additional cash flows	Calculate the cost of capital each year based on the LICAT formula

Appendix B – Adjustments for financial assumptions

Below is an illustration of all IFRS 13 adjustments for financial assumptions (discount rates and risks) with regards to the IFRS 17 discount curve and asset returns. This is meant to provide a high-level overview of all adjustments, as those are scattered in different sections of the educational note.



Potential adjustments for IFRS 13

Section 4.2.6 – Credit risk and market risk (other than interest rate risk)
Option 1: Exclude the credit/market risk from the expected return on assets and exclude the credit/market risk required capital
Option 2: Include the additional spread from credit/market risk in expected return on assets maintain the associated cost of capital

Section 4.2.6 – Interest rate risk (illiquidity premium)
Risks that future illiquidity premium could be different than those implied in IFRS 17 discount curve and risk that current illiquidity premium in IFRS 17 discount curve could by different than those earned on supporting assets.
Section 4.3.3 – Adjustments to IFRS 17 illiquidity premium
Adjustment if market participant have a different view on illiquidity than the entity

Section 4.2.6 – Interest rate risk
Impossible to achieve perfect asset/liability matching and thus need to consider ALM risk
Risks that future risk-free rate could be different than those implied in IFRS 17 discount curve
Section 4.3.2 – Adjustments to IFRS 17 risk-free rates
Risk-free rates under IFRS 17 are market consistent and thus no adjustment is expected to reflect the perspective of a market participant

Appendix C – Numerical examples (adjusted FCF)

Definitions & Equations

Terminology	Definition	Equation
Discount rate (DR)	Rate used to discount liabilities under IFRS 17	
Fair value rate (FVR)	Rate used to discount liabilities consistent with IFRS 13	FVR = DR + Adjustment for Own Credit Risk
Fulfilment cash flows (FCF)	Present value of IFRS 17 fulfilment cash flows (future cash flow + risk adjustment) at the transition date	FCF = PV_{DR}(IFRS 17 Cash Flows)
Adjusted fulfilment cash flows (AFCF)	FCF + present value of adjustments for items excluded from IFRS 17 cash flows (e.g., non-directly attributable expenses)	AFCF = PV_{FVR}(IFRS 17 Cash Flows + Adjustments)
Target available capital (TAC)	Available capital required to maintain target capital ratio, considering only solvency buffers relevant to liability	TAC = (base solvency buffer net of diversification) * target capital ratio - risk adjustment
Hurdles rate (HR)	Required rate of return on capital committed	HR = Weighted average cost of capital
Cost of capital rate (CoCR)	Required rate of return on capital committed net of return provided by supporting assets	CoCR = HR – Earned Rate on Surplus
Cost of Capital (CoC)	Present value of required $ return on capital committed	CoC = PV_{HR}(TAC * CoCR)
Profit margin (PM)	Additional compensation above AFCF that a third party would require to assume the liabilities	PM = COC – PV_{HR}(RA Release)
Fair value (FV)	Total compensation a third party would require to assume the liabilities	FV = AFCF + PM
Contractual service margin (CSM)	Transition CSM calculated under Adjusted Fulfilment Cash Flows approach to fair value	CSM = FV – FCF = AFCF + PM – FCF

Illustrative Example

Assumptions:

Discount rate assumptions:

- IFRS 17 discount rate = 5%
- Own credit risk = 0.10%
- Hurdle rate = 12%
- Earned rate on Surplus and Assets Backing CSM = 4%

Capital related assumptions

- Capital requirement for insurance risk = 15% of FCF
- Capital requirement for operational risk = 2% of FCF
- Capital requirement for market risk = 5% of FCF
- Capital requirement for other risk = 5% of FCF
- Diversification credit = 15%
- Target capital ratio = 120%
- Cost of capital is only required profit
- Assume additional interest spread offsets cost-of-capital related to assets (asset default, market risk other than interest rate risk, etc) – see section 4.2.6, option #1

Cash flow assumptions :

- IFRS 17 future cash flows / year = 1,000
- Risk adjustment = 2% of fulfilment cash flows
- Non-attributable expenses = 1% of future cash flows
- Release of risk adjustment is only source of profit embedded in liability
- Non-directly attributable expenses are only cash flow relevant to fair value excluded from IFRS 17 liability
- Tax Rate = 0%

Assumptions by Year	0	1	2	3	4	5	6	7	8	9	10
Future Cash Flows		1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000
Risk Adjustment Release		20	20	20	20	20	20	20	20	20	20
Non-Directly Attribtuable Expenses		10	10	10	10	10	10	10	10	10	10
Other Cash Flow Adjustments											
Additional Required Profit Margin											
Insurance Risk Base Solvency Buffer	1 158	1 066	969	868	761	649	532	408	279	143	-
Operational Risk Base Solvency Buffer	154	142	129	116	102	87	71	54	37	19	-
Interest Rate Risk Base Solvency Buffer	386	355	323	289	254	216	177	136	93	48	-
Other Solvency Buffers (Credit Risk, Equity Risk, ...)	386	355	323	289	254	216	177	136	93	48	-
Discount Rate	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%
Own Entity Credit Risk	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%
Earn rate on Capital	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%

Calculated Values

Calculated Values by Year	0	1	2	3	4	5	6	7	8	9	10
PV of Future CFs	7,722	7,108	6,463	5,786	5,076	4,329	3,546	2,723	1,859	952	-
Risk Adjustment	154	142	129	116	102	87	71	54	37	19	-
Fulfilment Cash Flows	**7,876**	**7,250**	**6,592**	**5,902**	**5,177**	**4,416**	**3,617**	**2,778**	**1,897**	**971**	**-**
Target Available Capital	1,578	1,453	1,321	1,183	1,037	885	725	557	380	195	-
Hurdle Rate	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%
Cost of Capital Rate	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%
Discount Factor - Hurdle Rate	1.00	0.89	0.80	0.71	0.64	0.57	0.51	0.45	0.40	0.36	0.32
Discount Factor - Discount Rate	1.00	0.95	0.91	0.86	0.82	0.78	0.75	0.71	0.68	0.64	0.61
Discount Factor - Fair Value Rate	1.00	0.95	0.91	0.86	0.82	0.78	0.74	0.71	0.67	0.64	0.61

CSM Calculation

Adjusted FCF Approach	PV	1	2	3	4	5	6	7	8	9	10
Fulfilment cash Flows		1,020	1,020	1,020	1,020	1,020	1,020	1,020	1,020	1,020	1,020
Less: Own Entity Credit Risk		(8)	(7)	(7)	(6)	(5)	(4)	(4)	(3)	(2)	(1)
Add: NDA Expenses		10	10	10	10	10	10	10	10	10	10
Add: Other Adjustments		-	-	-	-	-	-	-	-	-	-
Adjusted Fulfilment Cash Flows (@FVR)	**7,915**	**7,289**	**6,630**	**5,938**	**5,211**	**4,447**	**3,644**	**2,800**	**1,912**	**980**	**-**
Add: Cost of Capital [Insurance, Interest, and Operational Risk]	484	126	116	106	95	83	71	58	45	30	16
Less: Release of risk provision	(113)	(20)	(20)	(20)	(20)	(20)	(20)	(20)	(20)	(20)	(20)
Add: Other Required Profit	-	-	-	-	-	-	-	-	-	-	-
Profit Margin (@ Hurdle Rate)	**371**	**106**	**96**	**86**	**75**	**63**	**51**	**38**	**25**	**10**	**(4)**
Fair Value	**8,286**	**7,395**	**6,727**	**6,024**	**5,286**	**4,510**	**3,695**	**2,838**	**1,937**	**990**	**(4)**
CSM under AFCF Approach (FV -FCF)	$ 410										

Supporting calculation file:

Note: File also includes example for Appendix D

Appendix D – Numerical examples (Appraisal Value)

Definitions and equations

As in Appendix C except:

Terminology	Definition	Equation
Future profit (FP)	Profit that a third party would expect to earn by assuming liabilities; excluding release of CSM	FP = RA Release + Own Entity Credit Risk – NDA Expenses + Other Profit sources
Fair value (FV)	Total compensation a third party would require to assume the liabilities	FV = FCF + CoC – FP
Contractual service margin (CSM)	Transition CSM calculated under appraisal value approach to fair value	CSM = FV – FCF = CoC – FP

Illustrative example (see Appendix C for additional details)

Assumptions

As in Appendix C

CSM calculation

Year	PV	1	2	3	4	5	6	7	8	9	10	*ED Note Reference Section*
Cost of Insurance Risk Capital (net of Surplus Allowance)	379	99	91	83	74	65	55	45	35	24	12	*4.2.4, 4.2.5*
Cost of Operational Risk Capital	57	15	14	12	11	10	8	7	5	4	2	*4.2.6*
Cost of Interest Rate Risk Capital	142	37	34	31	28	24	21	17	13	9	5	*4.2.6*
Diversification Credit	(94)	(24)	(23)	(20)	(18)	(16)	(14)	(11)	(9)	(6)	(3)	*4.2.6*
Other Required Profit	-	-	-	-	-	-	-	-	-	-	-	*4.4.2*
Cost of Capital	**484**	**126**	**116**	**106**	**95**	**83**	**71**	**58**	**45**	**30**	**16**	
Risk Adjustment Release	113	20	20	20	20	20	20	20	20	20	20	*4.2.4, 4.2.5*
Add: Own Entity Credit Risk	30	8	7	7	6	5	4	4	3	2	1	*4.4.1*
Less: NDA Expenses	(57)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	*4.1.3*
Add: Other Profit Sources	-	-	-	-	-	-	-	-	-	-	-	*4.1*
Future Profit [exc. CSM release]	**87**	**18**	**17**	**17**	**16**	**15**	**14**	**14**	**13**	**12**	**11**	
CSM Under EV Approach (= CoC - Profit)	$ 397	300	222	158	108	70	41	21	8	1	-	

Alternate calculation

Alternatively, transition CSM can be solved recursively such that target hurdle rate is achieved on capital committed (i.e., future profit including CSM release = required profit at hurdle rate).

In this example, this is equivalent to the direct method above because assets backing CSM are assumed to earn the same return as assets backing surplus, making the split between the CSM and surplus inconsequential. If returns of supporting assets differed between CSM and surplus, the run-off pattern of the CSM would have an impact on investment income and there could be minor differences in CSM between approaches.

Alternative Calculation / Check	*0*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
Required Surplus [TAC - CSM - RA]	***1,181***	***1,152***	***1,100***	***1,025***	***929***	***815***	***684***	***536***	***372***	***193***	-
Capital Committed (Released)	(1,181)	29	53	75	95	114	132	148	164	179	193
Add: Cash Outflows [net of own defaults]		(1,002)	(1,003)	(1,003)	(1,004)	(1,005)	(1,006)	(1,006)	(1,007)	(1,008)	(1,009)
Add: Change in FCF Liability		626	658	690	725	761	799	839	881	925	971
Add: Investment Income on Assets Backing Fulfilment Cash Flows		394	362	330	295	259	221	181	139	95	49
Add: Investment Income on Assets Backing Surplus & CSM		63	58	53	47	41	35	29	22	15	8
Add: Change in CSM		97	79	63	50	38	29	20	13	7	1
Total Cashflow	**(1,181)**	**206**	**207**	**208**	**208**	**209**	**210**	**211**	**212**	**212**	**213**
Return on Capital	12.00%	Check	0.00%								
Transition CSM	397	Check	-								

Comparison with adjusted FCF approach

As shown, the transition CSM calculated under adjusted FCF approach and appraisal value approach are largely equivalent under similar assumptions. There may be minor differences due to differences in discounting of some items.

Comparison of Approaches	Adjusted FCF	Appraisal Value	Difference	Comment on Difference
Own Credit Risk	(38)	(30)	(8)	@ Discount rate in AFCF vs @ hurdle Rate in EV
NDA Expenses	77	57	20	@ Discount rate in AFCF vs @ hurdle Rate in EV
Other Cash Flow Adjustments	-	-	-	@ Discount rate in AFCF vs @ hurdle Rate in EV
Insurance Risk [net of Surplus allowance and RA release]	266	266	-	No Difference
Operational Risk	57	57	-	No Difference
Interest/Reinvestment Risk	142	142	-	No Difference
Diversification Benefit	(94)	(94)	-	No Difference
Other Required Profit	-	-	-	No Difference
CSM	410	397	12	Can differ slightly due to discounting

The results above are for illustration purposes only. They do not represent a fair representation of the level or origin of the transition CSM. For example, the bulk of the CSM in this example is from insurance risk (entity's view vs market participant view). In some cases, the entity's view may be perfectly aligned with the market participant view which could results in no transition CSM for this element.