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Educational Note

Guidance for the 2018 Valuation of Insurance Contract Liabilities of Life Insurers

Document 218115

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Committee on Life Insurance Financial Reporting

September 2018

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MEMORANDUM

To: Members in the life insurance practice area

From: Faisal Siddiqi, Chair
Standards and Guidance Council

Stéphanie Fadous, Chair
Committee on Life Insurance Financial Reporting

Date: September 12, 2018

Subject: **Educational Note: Guidance for the 2018 Valuation of Insurance Contract Liabilities of Life Insurers**

Introduction

The purpose of this educational note is to provide guidance to actuaries in several areas affecting the valuation of the 2018 year-end insurance contract liabilities of life insurers for Canadian generally accepted accounting principles (GAAP) purposes. In addition, the note provides an update on recently published experience studies and introductory information about potential changes in future financial reporting. The guidance in this educational note represents a majority view of the members of the Committee on Life Insurance Financial Reporting (CLIFR) of appropriate practice consistent with the Standards of Practice.

In accordance with the Canadian Institute of Actuaries' (CIA) 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 final approval for distribution by the Standards and Guidance Council on September 4, 2018.

The actuary should be familiar with relevant educational notes. They do not constitute standards of practice and are, therefore, not binding. They are, however, intended to illustrate the application of the Standards of Practice, so there should be no conflict between them. The actuary should note however that a practice that the educational notes describe for a situation is not necessarily the only accepted practice for that situation and is not necessarily accepted actuarial practice for a different situation. Responsibility for the manner of application of standards of practice in specific circumstances remains that of the members.

Guidance to Members on Specific Situations

From time to time, CIA members seek advice or guidance from CLIFR. Both the CIA and CLIFR strongly encourage such dialogue. CIA members would be assured that it is proper and appropriate for them to consult with the chair or vice-chair of CLIFR.

CIA members are reminded that responses provided by CLIFR are intended to assist them in interpreting the CIA Standards of Practice, educational notes, and Rules of Professional Conduct, in assessing the appropriateness of certain techniques or assumptions. A response from CLIFR does not constitute a formal opinion as to whether the work in question is in compliance with the CIA Standards of Practice. Guidance provided by CLIFR is not binding upon the member.

Recent Guidance

The following revisions to the Standards of Practice and related promulgations have been approved recently:

- Memorandum: Revisions within the Practice-Specific Standards for Insurance (Sections 2400 and 2500) (February 22, 2018);
- Final Standards – Revisions within the Practice-Specific Standards for Insurance (Sections 2400 and 2500) (February 22, 2018);
- Memorandum – Final Standard – Revisions to General Standards (Part 1000) (December 12, 2017);
- Final Standards – General (Part 1000) (December 12, 2017);
- Final Communication of Updated Promulgations of the Ultimate Reinvestment Rates and Calibration Criteria for Stochastic Risk-Free Interest Rates in the Standards of Practice for the Valuation of Insurance Contract Liabilities: Life and Health (Accident and Sickness) Insurance (Subsection 2330) (July 28, 2017);
- Final Communication of a Promulgation of Prescribed Mortality Improvement Rates and Associated Margins for Adverse Deviations within the Practice-Specific Standards on Insurance Contract Valuation: Life and Health (Accident and Sickness) Insurance (Subsection 2350) and the Accompanying Promulgation (July 30, 2017);
- Final Communication of a Promulgation of Prescribed Mortality Improvement Rates and Associated Margins for Adverse Deviations within the Practice-Specific Standards on Insurance Contract Valuation: Life and Health (Accident and Sickness) Insurance (Subsection 2350) and the Accompanying Promulgation – Excel Workbook (July 30, 2017);
- Final Communication of a Promulgation of Calibration Criteria for Equity Investment Returns Referenced in the Standards of Practice for the Valuation of Insurance Contract Liabilities: Life and Health (Accident and Sickness) Insurance (Subsection 2370) (July 28, 2017);
- Memorandum: Revisions to the Practice-Specific Standards for Insurance (Part 2000) (February 3, 2017); and
- Final Standards – Practice-Specific Standards for Insurance (Part 2000) (February 3, 2017).

Recent CLIFR guidance includes the following material:

- Educational Note: Life Insurance Capital Adequacy Test (LICAT) and Capital Adequacy Requirements for Life and Health Insurance (CARLI) (March 2018)
- Revised educational note supplement: Calibration of Stochastic Risk-Free Interest Rate Models for Use in CALM Valuation (August 2017);
- Research paper: Calibration of Equity Returns and Volatility for Stochastic Models (May 2017);
- Educational note supplement: Selective Lapsation for Renewable Term Insurance Products (February 2017); and
- Educational note supplement: Selective Lapsation for Renewable Term Insurance Products – Illustration of Methods (February 2017).

Recent Committee on Risk Management and Capital Requirements (CRMCR) guidance includes the following material:

- Revised Educational Note: Regulatory Capital Filing Certification for Life Insurers (July 12, 2018);
- Second Revision of Educational Note: Dynamic Capital Adequacy Testing (November 24, 2017); and
- Educational note: Performance of DCAT in 2017 for Life and Health Insurers (February 2017).

Recent guidance for mortality improvement includes the following material:

- Research Paper on Mortality Improvement Promulgation (May 2017);
- Research Paper on Mortality Improvement Promulgation – Excel File (May 2017);
- Task Force Report on Mortality Improvement (Final) (September 2017); and
- Task Force Report on Mortality Improvement (Final) – Excel File (September 2017).

For your convenience all of these publications can be found on the CIA website under Publications. A list of all the current educational notes and research papers can be found in appendix A.

Some guidance provided last year is still appropriate, and has been duplicated in this educational note. The guidance is labelled as unchanged. Other guidance has been modified, either to reflect recent developments or to improve clarity and is labelled as modified.

The topics covered herein are

If you have any questions or comments regarding this educational note, please contact Stéphanie Fadous at Stephanie_Fadous@manulife.com.

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1. Experience Studies *(modified)*

The Experience Studies Research Subcommittee (of the Research Executive Committee) has published the following studies:

- Mortality study – Canadian Standard Ordinary Life Experience 2015–2016 Using 86–92 and 97–04 Tables (September 2018).

  This report submitted by the Experience Research Subcommittee of the Canadian Institute of Actuaries (CIA) Research Council details the intercompany mortality experience for Canadian standard ordinary life insurance policies. It reflects the mortality experience of Canadian standard individual ordinary insurance issues between the 2015 and 2016 policy anniversaries.

- Mortality study – Canadian Individual Annuitant Mortality Experience Policy Years 2005–2006 to 2014–2015 (November 2017).

  This study updates the 2002–2003 through 2011–2012 study published in 2016; the information presented does not require knowledge of the prior study. Seven companies contributed to this study. The following changes were made since the last study:

  - The base expected table has been updated from the 1983 Individual Annuity Mortality Basic Table (IAM 1983) to Canadian Insured Payout Mortality Table 2014 (CIP 2014);
  - Mortality improvement is now applied to the base expected table to the year of experience; and
  - Structured settlement policies have been excluded from the results.

  The study considers experience of Canadian individual annuities. Most of the policies studied are in payout status but in some cases experience is included during the deferred period, provided the policy has no cash value and the policy cannot be changed.

- Mortality study – Canadian Insured Payout Mortality Table 2014 (CIP2014) (February 2015).

  The CIA has been collecting data on individual annuities on a seriatim basis since 1989, but no mortality table has been produced from the data. The paper sets out the construction of the first mortality table for Canadian payout annuities, CIP2014. It is based on data of the CIA individual annuitant mortality study for years of experience 2000–2011, but excluding data for policies with annual income of $72,000 or more.

- Mortality study – Canadian Group Annuitant Mortality Experience, Calendar Years 2007–2012 (April 2017).

  This is the inaugural report studying mortality experience for Canadian group annuitants with contributions from six companies. It covers the experience for calendar years 2007 to 2012.

- Morbidity study – Canadian Individual Critical Illness Insurance Morbidity Experience Study Including Policy Anniversaries Between 2005 and 2014 Using Expected Incidence Rate Tables 2008 CANCI (October 2016).

  This is the third report submitted by the Individual Living Benefits Experience Subcommittee of the Research Committee detailing the intercompany morbidity experience for Canadian individual critical illness (CI) insurance policies.

- Lapse study – Lapse Experience Study for 10-Year Term Insurance (January 2014).

  This study of lapse experience under Canadian fully-guaranteed individual renewable and convertible 10-year term insurance (T10) policies was conducted by the Individual Life Experience Subcommittee. This is the first study of T10 lapses conducted by the CIA. Ten of the largest writers of T10 insurance in Canada contributed. The study period runs from January 1, 2005 to December 31, 2010. Lapse rates vary by face amount as evidenced by the differences in lapse rates based on policy count and lapse rates based on amount of insurance. Consequently, most of the analysis in the report is presented on both bases.

- Lapse study – Lapse Experience under Term-to-100 Insurance Policies (September 2015).

  This is the sixth lapse experience study covering term-to-100 and similar insurance policies (collectively referred to as "T100"). This study covers calendar years 2005–2012; the previous study covered 1999–2004. Overall, compared to the prior study, lapse rates are lower than those observed before.

- Lapse study – Lapse Experience under Universal Life Level Cost of Insurance Policies (September 2015).

  This is the third lapse experience study covering universal life level cost of insurance policies (referred to as "LCOI", "UL" is used to refer to all types of universal life policies). This study covers calendar years 2005–2012. Overall, compared to the prior study, lapse rates are slightly lower than those observed before at most durations.

- Group health and dental insurance claims report – Extended Healthcare and Dental Experience: A Report on a Post-employment Benefits Experience Study (March 2016).

  This report covers the first-ever group health and dental insurance claims experience study in Canada. The primary focus is the experience for employees aged 50+ to assist actuaries in valuing post-employment benefits.

The Experience Studies Research Subcommittee plans to publish the following documents in the future:

- Canadian Segregated Fund Policyholder Behaviour Company Practices Survey;
- Canadian Segregated Fund Policyholder Behaviour Experience Study;
- Canadian Segregated Fund Mortality Experience Study; and
- Group LTD study phase 1.

The Segregated Fund survey and studies are inaugural reports presenting company practices, mortality experience, and lapse experience for Canadian segregated fund business with contributions from six companies.

The Group LTD study will be completed in two phases. Phase 1 is an updated study of Canadian Group Long-Term Disability termination tables based on more recent experience and will be available in 2018. Phase 2 will take the updated data from the phase 1 study and use predictive analytics techniques to analyze the effects of approximately 15 variables.

2. Life Insurance and Annuity Mortality *(modified)*

On July 30, 2017, the Actuarial Standards Board (ASB) published a Final Communication of a Promulgation of Prescribed Mortality Improvement Rates Referenced in the Standards of Practice for the Valuation of Insurance Contract Liabilities: Life and Health (Accident and Sickness) Insurance (Subsection 2350) with an effective date of October 30, 2017.

This updated promulgation introduces new prescribed mortality improvement rates to be used in the calculation of the minimum valuation assumption, and the notion of diversification between death-sensitive and death-supported business. The new prescribed mortality improvement rates are a function of both the attained age and the calendar year. The promulgation also provides additional guidance on subsection 2350 on the definition of "appropriate level of aggregation" with regards to the impact of inclusion of mortality improvement in insurance contract liabilities, and on the application of mortality improvement rates for the calculation of accident and sickness insurance liabilities.

In addition, on May 17, 2017, the ASB Designated Group published a Research Paper on Mortality Improvement Promulgation that provides a rationale for the proposed mortality improvement rates of the updated promulgation. This paper references a final report prepared by the CIA Task Force on Mortality Improvement published in 2017. This report provides an analysis of the rate of mortality improvement for the Canadian population and the construction of a mortality projection scale for the purpose of reflecting future mortality improvement in Canadian actuarial work.

The actuary would be aware that mortality improvement is embedded in the CPM2014 and CIP2014 mortality tables that adjusts the experience from the actual year up to 2014. The mortality improvement scale used in building these tables is the CPM-B scale. The actuary would consider if the use of these mortality tables without any adjustments is appropriate in the context of the most recent promulgation regarding mortality improvement.

The 2017 research paper did not comment specifically on the calculation of the best estimate expectation of life (e_x). This calculation is relevant because it is a component of the life insurance margins for adverse deviations. Section 4.1 of the Mortality Improvement Research Paper published by CLIFR in September 2010 says that "The e_x component of the MfAD for the valuation of life insurance at attained age x, could be calculated as follows:", then goes on to express a formula for e_x that includes a mortality improvement term applied to the q_x in the projection. It then goes on to define the mortality improvement term as the "best estimate mortality improvement rate at age x+t". This guidance implies that e_x would be calculated using

best estimate mortality improvement assumptions. CLIFR recommends that this methodology be applied when calculating e_x.

3. Accident and Sickness (A&S) Insurance Mortality and Morbidity *(unchanged)*

Mortality Improvement *(unchanged)*

The mortality improvement promulgation referred to in section 2 (Life Insurance and Annuity Mortality) also applies to A&S insurance, although the application varies by the status of the policyholder:

- ***Active lives*** (lives **not** currently receiving benefits and the portion of lives that are **not** expected to be in receipt of future benefits as measured in an active life reserve): the guidance provided in section 2 applies.
- ***Non-active lives*** (lives currently receiving benefits and the portion of lives that are expected to be in receipt of future benefits as measured in an active life reserve): the promulgation states that the actuary may consider reflecting mortality improvement; however, the minimum valuation assumption for mortality improvement does not apply to the valuation of these lives.

Morbidity Trends *(unchanged)*

In addition, the actuary may consider reflecting secular morbidity trends for accident and sickness insurance if the actuary has credible data or if the actuary has reliable benchmark data to use for purposes of projecting a morbidity trend. The data supporting longer-term trend assumptions would cover a relevant and sufficiently long period of experience to ascertain the secular trend and rule out shorter-term cyclical trends.

If a morbidity trend assumption is applied, then the actuary would apply a margin on the best estimate assumption consistent with subsection 2350 of the Standards of Practice. The actuary would consider whether the morbidity trend demonstrates unusually high uncertainty and would warrant selection of a margin above the high margin as noted in paragraph 2350.05 of the Standards of Practice. When assessing the appropriateness of aggregate provision for adverse deviations (PfAD) level, actuaries would consider the interrelationships of the assumptions and any potential undesirable compounding of provisions.

4. Economic Assumptions (*modified*)

Credit Spreads

The revised educational note: Investment Assumptions Used in the Valuation of Life and Health Insurance Contract Liabilities (September 2015) provides guidance on developing assumptions for credit spreads, including margins and limits. Two clarifications follow:

- If testing at the level at which the Canadian asset liability method (CALM) liabilities are determined demonstrates that the promulgated maximum net credit spread after margin (net of defaults) increases the liabilities, then the additional margin pertaining to the net credit spread after margin would be applied on each fixed-income asset. This is illustrated by the following example:

- The investment strategy in a given CALM segment assumes that reinvestment will be in three equally weighted fixed-income assets, with assumed ultimate net credit spreads after margin of 130 bps, 90 bps, and 50 bps respectively.
- The average net credit spread after margin, prior to the application of the paragraph 2330.08 additional margin is 90 bps.
- After application of the paragraph 2330.08 additional margin, the net credit spreads after margin for the first two assets are reduced to 80 bps each, and there is no change to the 50 bps assumption for the third asset. The resulting average net credit spread after margin is 70 bps.

- Additional scenarios (as defined in paragraph 2330.33) are limited to varying risk-free interest rates and not credit spreads.

In 2017, CLIFR formed a subcommittee to review the promulgated net credit spread. The mandate of the subcommittee was to update the data used by the prior group for recent years, and assess if there is a need to recommend a change to the maximum of 80 bps promulgated in May 2014 (document 214046). The working group's conclusion is that the change in historical spreads, after adding four years of data, is small and there is no evidence to support recommending a change to the promulgated maximum net credit spread of 80 bps.

Ultimate Reinvestment Rate

The ASB is responsible for promulgating the calibration criteria for stochastic risk-free interest rate models and the ultimate reinvestment rates (URRs) from time to time. The ASB promulgated new URRs and new calibration criteria for year-end 2017. The ASB continues to monitor the low interest rate environment and the potential impacts on the promulgations.

In 2018, CLIFR published an explanatory report entitled Development of the Ultimate Reinvestment Rates (URRs) that describes the process by which the promulgated URRs were developed.

At the request of the ASB, CLIFR has provided them with an update with respect to how the current URRs may be impacted by updated data. The preliminary analysis has highlighted that there continues to be downward pressure on the URRs due to the continued low interest rate environment. Based on this work, there is the potential for an update to URRs as early as 2019. The ASB plans to form a designated group to review the calibration criteria and URR promulgations.

Negative Interest Rates

There is an increased prevalence of negative interest rates in developed markets around the world. The actuary would consider the implications on the valuation of insurance contract liabilities when interest rates are negative.

CLIFR formed a new subcommittee in 2016 to investigate the implications of negative interest rates for the prescribed scenarios. The subcommittee concluded that the construction of the prescribed scenarios remains appropriate if negative interest rates prevail at valuation date.

Non-fixed Income (NFI) Return Where Reliable Historical Information is not Available

CLIFR formed a sub-committee in 2017 to provide additional guidance on setting the non-fixed income returns for the purpose of valuation, where reliable historical information is not available (as per paragraph 2340.18 of the Standards of Practice). More specifically, the sub-committee investigated the treatment of tax attributes in setting these assumptions and whether additional criteria for selecting benchmarks are necessary.

When setting investment return assumptions for non-fixed income (NFI) assets, the actuary would refer to the CIA Standards of Practice (SOP) and 2011 CLIFR educational note Investment Return Assumptions for Non Fixed Income Assets for Life Insurers (2011 educational note) for guidance. CLIFR was asked to review the existing guidance from two perspectives:

1. Assess whether the SOP and 2011 educational note provide sufficient criteria for determining appropriate benchmark indices, in situations where potential benchmarks exist.
2. Assess whether the SOP and 2011 educational note provide sufficiently clear guidance on capping the NFI return assumptions, in situations where reliable historical information does not exist.

CLIFR concluded, in consultation with the ASB, that no new guidance is necessary regarding the criteria for selecting appropriate benchmarks for NFI returns. However, additional guidance has been developed regarding the impact of taxes in the calculation of caps for assumed returns on NFI assets that lack reliable historical data. Both positions are explained below.

(1) Criteria for Benchmarks for NFI returns

Paragraph 2340.15 of the SOP provides clear guidance that the NFI return assumption should not be more favourable than a benchmark based on historical performance of assets of its class and characteristics. The 2011 educational note provides further guidance on the meaning of "class and characteristics" and the time period over which the historical benchmark would be assessed. Furthermore, the 2011 educational note lists some specific benchmark indices that meet the criteria outlined in the SOP.

Use of the benchmark indices listed in the 2011 educational note would be appropriate without the need for justification if there is a clear linkage between the asset portfolio being modeled and the benchmark (e.g., if TSX is the index chosen to model the expected return on a diversified portfolio of Canadian equities). However, if the linkage is not clear, or if the chosen index is not listed in the 2011 educational note, then the actuary is reminded that it would be good practice to document how and why the chosen index is fit for purpose. Such documentation could include evidence of the following:

- The benchmark is viewed by a consensus of experts (internally and/or externally) as appropriate for the assets under consideration. In order to evidence the expert review, a formal report from the expert can be obtained which should include the expert's opinion on choice of benchmark and the key elements of its suitability. In some circumstances, analysis is undertaken pertaining to the benchmark which would support the actuary's

choice of using it for valuation purposes. The actuary can use that information to support the choice of benchmark.

- The data underlying the benchmark has been validated for reliability.
- Caution should be exercised in removing data points where the removal of such data points results in a less prudent estimate of returns

In order to use a benchmark the actuary must have confidence that it is fit for purpose and reliable.

(2) Capping NFI Assumptions where reliable historical information does not exist

In situations where the actuary cannot show that a given index is fit for purpose, or where no reliable historical information exists for a given NFI asset, paragraph 2340.18 would apply. That section of the Standards indicates that the actuary should cap the implied net risk premium inherent in the NFI return assumption at the net risk premium for assets of a similar class in (a) the same jurisdiction if reliable benchmarks are available in that jurisdiction, or (b) Canada, if reliable benchmarks are not available in that jurisdiction. If no similar asset class benchmark is available, then an appropriate equity benchmark should be used; the Canadian equity benchmark should be used if no reliable equity benchmark exists in the given jurisdiction.

The 2011 educational note provides a numerical example of how the net risk premium could be calculated. Neither paragraph 2340.18 nor the 2011 educational note specifically mention taxes. However, taxes could have a significant impact on market returns, especially in cases where a particular asset class receives tax-favoured treatment relative to other asset classes (e.g., dividends on Canadian equities). Furthermore, the general intent of the Standards is that the calculation of liabilities should comprise all cash flows in the term of the liability, including taxes.

CLIFR concluded that the example in the 2011 educational note should be enhanced to reflect taxes for comparisons of risk premiums between asset classes in the same jurisdiction, but that taxes need not be considered for comparisons of risk premiums between jurisdictions. This assessment is based on the theory that market participants would demand higher returns on non-tax-favoured assets relative to tax-favoured assets within the same jurisdiction, and therefore it would be appropriate to calibrate the corresponding net risk premiums, and more generally the impact on liabilities, on an after-tax basis. The relative after-tax return comparison becomes more complicated and perhaps less relevant for assets in different jurisdictions, hence CLIFR endorses the pre-tax comparison of net risk premiums in this situation.

Appendix B-1 repeats the example from the 2011 educational note, as it continues to be applicable when comparing risk premiums for a given asset class between Canada and a foreign jurisdiction. Appendix B-2 expands upon the 2011 educational note example, illustrating an after-tax net risk premium comparison within the same jurisdiction.

5. International Financial Reporting Standards (modified)

IFRS 17

In May 2017, the International Accounting Standards Board (IASB) published the final standards for Insurance Contracts, IFRS 17. The implementation date will be fiscal years beginning on or after January 1, 2021. For the most current information please see the IASB website. Note that an eIFRS professional account is required to access the final standards and related documents.

The ASB Designated Group on Insurance Contract Standards of Practice, published the following document in May 2018: Exposure Draft – Incorporate changes required by the adoption in Canada of IFRS 17 Insurance Contracts, including Principles of International Standard of Actuarial Practice 4 – Actuarial Practice in Relation to IFRS 17 Insurance Contracts, into the Canadian Standards of Practice. The Canadian Accounting Standards Board has indicated its intention that, once adopted by the IASB, and subject to its due process, IFRS 17 will be adopted without modification for the valuation of insurance contracts in Canadian generally accepted accounting principles (GAAP) financial statements. The International Actuarial Association (IAA) released its Exposure Draft of Proposed International Standard of Actuarial Practice 4 (ISAP 4) on IFRS 17 Insurance Contracts in February. ISAP 4 covers actuarial practice in support of valuation of insurance contract liabilities in accordance with IFRS 17. The changes proposed in the CIA exposure draft align the SOP with the requirements of IFRS 17, and incorporate the guidance of ISAP 4. These developments require changes to the Canadian SOP, as the valuation methods under IFRS 17 are significantly different from the current methods of valuation of insurance contracts in Canada.

The CIA Committee on International Insurance Accounting (IIAC) under the International Relations Council has the following mandate with regards to international accounting and actuarial standards for the valuation of insurance and related products:

- Monitor developments and ensure that news of relevant and material developments is dispersed appropriately within the CIA;
- Recommend where specific additional Canadian guidance may be helpful, and if so, assist in its development; and
- Where relevant and appropriate, provide input from a CIA perspective to the international governing bodies.

The IIAC is developing an educational note highlighting the key differences between CALM and IFRS 17, which will be published in 2018.

The IAA is also planning to publish an International Actuarial Note (IAN) with several chapters. These chapters, similar to CIA educational notes, should help practitioners with the application of IFRS 17.

The CIA is very active in this area, with several committees involved in reviewing the IFRS 17 standard and related guidance. CLIFR will review the IANs and will consider adopting them as educational notes.

CLIFR will provide additional guidance to the members as needed, in the form of educational notes and reports. The primary focus will be on areas needing Canadian-specific guidance. CLIFR

will also consider providing additional material that may be helpful in implementing the new standards. Thus far, CLIFR has formed working groups to look at the following topics:

- Probability-weighted cashflows;
- Discount Rate;
- Risk Adjustment;
- Participating Insurance;
- Market Consistent Valuation of Financial Guarantees/Segregated Funds;
- Coverage units and Contractual Service Margin; and
- Investment Components and Embedded Derivatives.

The CIA is also engaged in educating members about IFRS 17, through webcasts, sessions at CIA meetings, and other forums. The CIA website now has an IFRS blog (you must log in to view the page), which provides up-to-date summaries of the various CIA activities and links to other relevant sources of information.

IFRS 9

Many insurers will not adopt IFRS 9 until IFRS 17 becomes effective in 2021. However, some entities will adopt in 2018, most notably those that are part of larger financial institutions, such as bank-owned insurers. For those entities that do adopt in 2018, the actuary would be aware that there could be changes in the carrying value of assets that could potentially affect the CALM valuation. There could also be new credit loss provisions established by the accountants under IFRS 9; if so, the actuary would take steps to avoid any double-counting with the credit provisions included in the CALM liability.

6. Stochastic Scenarios (*unchanged*)

Calibration Criteria for Equity Returns and Volatility: All Products

Calibration criteria for equity return assumptions for segregated fund liabilities were promulgated in 2012. A research paper that provided the rationale for these calibration criteria was published in February 2012. The 2012 research paper presented the results of the calibration of left and right tail of equity returns, but deferred the calibration of the volatility of equity returns in the context of hedging to a later date.

CLIFR created a working group in 2016 to update this research paper, and a revised research paper Calibration of Equity Returns and Volatility for Stochastic Models, was published on May 17, 2017. The ASB's final promulgation of recommendations from this paper occurred on July 28, 2017 and has an effective date of October 28, 2017.

The models and methodologies used to develop the equity return accumulation factor calibration criteria in the 2012 research paper were reviewed. The data used in the 2012 research paper analysis was also updated to include monthly TSX and S&P total return data between January 2011 and December 2015. As a result of this review and data update, no changes are proposed to the existing left-tail equity return accumulation factor calibration

criteria. With the addition of the equity volatility criteria (see below), right-tail return criteria and minimum volatility criteria are no longer needed.

In addition, equity volatility criteria are now provided in the form of minimum values of the annualized standard deviation of continuously compounded monthly returns for the 90th, and 95th percentiles for the one-year and five-year horizons.

Two sets of calibration criteria are provided, one for broad-based equity indices of non-Asian developed economies, and one for small capitalization equity indices. Guidance is also provided for indices that do not fall into these two categories.

The promulgated calibration criteria are intended to apply to the calibration of all stochastic models used for the determination of insurance contract liabilities, where such models require assumptions regarding real-world equity returns and volatility. The calibration criteria are not intended to apply to risk-neutral assumptions.

An advisory note was published by the Office of the Superintendent of Financial Institutions (OSFI) in December 2010 setting out calibration criteria for investment returns applicable when calculating capital requirements for segregated funds with an internal model. The actuary is reminded that OSFI criteria apply to the calculation of capital requirements for segregated funds only, whereas the criteria set out in the research paper apply to the calculation of any insurance contract liabilities using stochastic modelling of equity returns. However, nothing prevents the actuary from satisfying the OSFI criteria, when those criteria are more stringent than the promulgated criteria.

Calibration Criteria for Fixed-Income Returns: Segregated Funds

Calibration criteria for fixed-income returns were promulgated in 2014. A research paper that provided the rationale for these calibration criteria was published in April 2014. Calibration criteria are provided for the left tail of fixed-income returns at the one-, five-, 10-, and 20-year horizons as well as for the right tail at the one-year horizon, for three different initial benchmark yields. Calibration criteria are provided for Canadian and U.S. broad-based fixed-income indices, and qualitative guidance is provided for other types of fixed-income funds in the research paper.

Calibration Criteria for Risk-Free Interest Rate Models Used in CALM Valuation

CLIFR created a working group in 2016 to update the calibration criteria for stochastic risk-free interest rate models, and published a revised educational note supplement on August 16, 2017. The ASB's final promulgation of recommendations from this paper occurred on July 28, 2017 and has an effective date of October 28, 2017.

Included in the educational note supplement are updates to the guidance for the long-term (term to maturity of 20 years and longer) risk-free interest rate and for the short-term (one-year maturity) risk-free interest rate, medium-term (five- to 10-year maturity) risk-free interest rates, and the slope of the yield curve. The previous exercise considered data to the end of 2011; the current group updated data to mid-year 2016, but otherwise preserved the methodology applied in 2012.

7. Selective Lapsation *(unchanged)*

There are no changes to the guidance for the 2018 year-end valuation.

The educational note Expected Mortality: Fully Underwritten Canadian Individual Life Insurance Policies published in 2002 discusses the impact of selective lapsation on mortality after term renewal. The principles and formulas discussed in this educational note are based on Valuation Technique Paper #2 (VTP #2) published in 1986.

CLIFR formed a subcommittee in 2014 to determine whether the 2002 educational note remains appropriate, taking into account the evolution of the market and products over the last 30 years. As a result of this review, CLIFR issued an educational note supplement Selective Lapsation for Renewable Term Insurance Products published in 2017.

One of the important changes in the products available today compared to what was available in the past is the premium jump at renewal. VTP #2 was put in place at a time when the premium jump at renewal was about twice the initial premium. Today, the premium jumps are much higher. These premium jumps at renewal are driving lapse rates higher than 70 percent when considering lapses occurring in the first months after the renewal date.

The CLIFR subcommittee assessed the appropriateness of the VTP #2 method, considering the evolution of product design and the available industry experience. After the review, it was found that the VTP #2 method remains theoretically sound. Nevertheless, CLIFR suggests that the following aspects require consideration:

- Deaths during grace period: When lapse rates are low, modelling deaths during the grace period has an insignificant impact on mortality deterioration. This may not be the case when lapse rates are very high.
- Skewness of lapses: There is skewness in lapses throughout a policy year, and particularly in the year following the renewal date where lapses tend to be concentrated near the beginning of the next policy year. If the skewness in lapses in the year following renewal is not considered in the model, the projected mortality may be underestimated in the year following the renewal date.
- Underlying lapses: Not reflecting the underlying lapses in the VTP #2 method has an insignificant impact on mortality deterioration when the lapse rates are low. This may not be the case when lapse rates are very high.

8. Capital Section *(modified)*

From time to time, assumptions are promulgated or existing promulgations are reviewed by the ASB, and for Dynamic Capital Adequacy Testing (DCAT) purposes the actuary would consider whether changes to these promulgations should be assumed. These assumptions include mortality improvement assumptions, the maximum net credit spread after margin, ultimate reinvestment rates, calibration criteria for stochastic risk-free interest rates, and calibration criteria for equity returns.

LICAT Designated Group and Subcommittee

In 2016, a new designated group of the ASB was created to review the standards of practice for the preparation and filing of LICAT returns. The educational note Life Insurance Capital Adequacy Test (LICAT) and Capital Adequacy Requirements for Life and Health Insurance (CARLI) was published in 2018. It provides guidance to actuaries preparing LICAT or CARLI.

The objective of the educational note is to assist with interpretation of LICAT requirements and to narrow the range of practice in application of the new capital standards. The educational note covers the following topics: best estimate assumptions, quantification of provisions for adverse deviations for inclusion in the surplus allowance, future mortality improvement, participating policyholder dividend cash flows, participating and adjustable credit, future credited rates on universal life policies, and future income taxes. Note that although some of these topics pertain to the valuation of policy liabilities, the guidance provided in the educational note is for the purpose of preparing LICAT and does not apply to the valuation of policy liabilities itself.

Draft guidance for DCAT performed in 2018 and 2019

In May 2017, the IASB issued international IFRS Standard for insurance contracts, IFRS 17 *Insurance Contracts*, replacing IFRS 4 *Insurance Contracts*. IFRS 17 has an effective date of January 1, 2021.

It is also anticipated that regulatory capital guidelines will be adapted to reflect changes in accounting related to IFRS 17. These changes would technically need to be reflected in the DCAT for forecast periods that are past the IFRS 17 effective date applicable to the insurance entity. Given that changes to regulatory capital guidelines related to the adoption of IFRS 17 are unknown, Appointed Actuaries are not yet in a position to perform DCAT forecasts under an IFRS 17 basis. An appropriate practice would be to continue to perform DCAT using the current accounting standards, actuarial standards and current regulatory capital guidelines. For DCAT performed in 2019, it would also be appropriate to qualitatively describe to the board or chief agent either through routine updates or in the DCAT report, IFRS 17's potential impact on the insurance entity's financial results and regulatory capital, and explain the limitations on the assessment of financial condition.

The CRMCR will continue monitoring regulatory developments and industry progress and may provide further guidance for DCAT performed in 2019 as the situation evolves.

Appendix A: CIA Guidance

Accession Number	Title	Publication Date
General Standards		
218076	Exposure draft to incorporate changes required by the adoption in Canada of IFRS 17 Insurance Contracts, including Principles of International Standard of Actuarial Practice 4 – Actuarial Practice in Relation to IFRS 17 Insurance Contracts, into the Canadian Standards of Practice	May 16, 2018
218023	Final Standards – Revisions within the Practice-Specific Standards for Insurance (Sections 2400 and 2500)	February 22, 2018
218024	Memorandum: Revisions within the Practice-Specific Standards for Insurance (Sections 2400 and 2500)	February 22, 2018
217125	Final Standards – General (Part 1000)	December 12, 2017
217126	Memorandum – Final Standard – Revisions to General Standards (Part 1000)	December 12, 2017
217015	Memorandum: Revisions to the Practice-Specific Standards for Insurance (Part 2000)	February 3, 2017
217014	Final Standards – Practice-Specific Standards for Insurance (Part 2000)	February 3, 2017
217007	Educational Note—Use of Models	January 26, 2017
217005	Final Standards – Revisions to General Standards to Reflect the Use of Models	January 26, 2017
217006	Memorandum – Final Standards – Revisions to General Standards to Reflect the Use of Models	January 26, 2017
214128	Memorandum: Final Standards – Revisions to the General and Practice-Specific Standards – Consistency of Reporting and Conformance with International Standard of Actuarial Practice 1	December 9, 2014
214129	Final Standards – Revisions to the General and Practice-Specific Standards – Consistency of Reporting and Conformance with International Standard of Actuarial Practice 1	December 9, 2014
213008	Final Standards for Practice-Specific Standards on Insurance Contract Valuation (Section 2300) to Narrow the Range of Practice on Certain Elements	February 12, 2013
211091	Final Standards of Practice: Standards of Practice for Recognizing Events in Work (clean version)	September 26, 2011

Accession Number	Title	Publication Date
210088	Research Paper: IFRS Disclosure Requirements for Life Insurers	December 13, 2010
210086	Educational Note: Valuation of Gross Policy Liabilities and Reinsurance Recoverables	December 1, 2010
206147	Educational Note: Use of Actuarial Judgment in Setting Assumptions and Margins for Adverse Deviations	November 30, 2006
206132	Educational Note: Margins for Adverse Deviations	November 8, 2006
205122	Educational Note: Applicability of Rules, Standards, and Other Guidance to CIA Members	November 30, 2005
20169	Research Paper: Use of Stochastic Techniques to Value Actuarial Liabilities Under Canadian GAAP	August 15, 2001
Economic and CALM		
218091	Explanatory Report: Development of the Ultimate Reinvestment Rates	June 26, 2018
218033	Educational Note: Life Insurance Capital Adequacy Test (LICAT) and Capital Adequacy Requirements for Life and Health Insurance (CARLI)	March 14, 2018
217085	Revised Educational Note Supplement: Calibration of Stochastic Risk-Free Interest Rate Models for Use in CALM Valuation	August 16, 2017
217081	Final Communication of Updated Promulgations of the Ultimate Reinvestment Rates and Calibration Criteria for Stochastic Risk-Free Interest Rates in the Standards of Practice for the Valuation of Insurance Contract Liabilities: Life and Health (Accident and Sickness) Insurance (Subsection 2330)	July 30, 2017
217080	Final Communication of a Promulgation of Calibration Criteria for Equity Investment Returns Referenced in the Standards of Practice for the Valuation of Insurance Contract Liabilities: Life and Health (Accident and Sickness) Insurance (Subsection 2370)	July 28, 2017
217055	Research Paper: Calibration of Equity Returns and Volatility for Stochastic Models	May 17, 2017
215111	Educational Note Supplement: Development of the Equilibrium Risk-Free Market Curve for the Base Scenario	December 17, 2015

Accession Number	Title	Publication Date
215111T	Educational Note Supplement: Development of the Equilibrium Risk-Free Market Curve for the Base Scenario: Excel File	December 17, 2015
215072	Revised Educational Note: Investment Assumptions Used in the Valuation of Life and Health Insurance Contract Liabilities	September 16, 2015
214109	Research Paper: Development of New Prescribed Interest Rate Scenarios for CALM Valuations	October 10, 2014
214096	Final Communication of a Promulgation of Calibration Criteria for Investment Returns Referenced in the Standards of Practice for the Valuation of Insurance Contract Liabilities: Life and Health (Accident and Sickness) Insurance (Subsection 2360) (Fixed Income Returns)	August 21, 2014
214046	Final Communication of Promulgations of the Maximum Net Credit Spread, Ultimate Reinvestment Rates, and Calibration Criteria for Stochastic Risk-Free Interest Rates in the Standards of Practice for the Valuation of Insurance Contract Liabilities: Life and Health (Accident and Sickness) Insurance (Subsection 2330 of the Final Standards for Revisions to the Standards of Practice)	May 15, 2014
214047	Final Standards – Revisions to Economic Reinvestment Assumptions within the Practice-Specific Standards on Insurance Contract Valuation: Life and Health (Accident and Sickness) Insurance (Section 2300 and Subsection 1110)	May 15, 2014
214048	Memorandum: Final Standards – Revisions to Economic Reinvestment Assumptions within the Practice-Specific Standards on Insurance Contract Valuation: Life and Health (Accident and Sickness) Insurance (Section 2300 and Subsection 1110)	May 15, 2014
213107	Research Paper – Calibration of Stochastic Risk-Free Interest Rate Models for Use in CALM Valuation	December 21, 2013
211027	Educational Note: Investment Return Assumptions for Non-Fixed Income Assets for Life Insurers	March 1, 2011
209122	Educational Note: Calibration of Stochastic Interest Rate Models	December 3, 2009
209121	Educational Note: Currency Risk in the Valuation of Policy Liabilities for Life and Health Insurers	December 2, 2009
206133	Educational Note: Approximations to Canadian Asset Liability Method (CALM)	November 8, 2006

Accession Number	Title	Publication Date
206077	Educational Note: CALM Implications of AcSB Section 3855 Financial Instruments – Recognition and Measurement	June 7, 2006
203106	Educational Note: Selection of Interest Rate Models	December 2003
203083	Educational Note: Aggregation and Allocation of Policy Liabilities	September 15, 2003
Segregated Funds		
214034	Research Paper: Calibration of Fixed-Income Returns for Segregated Fund Liability	April 11, 2014
213004	Final Standards – Introduction of Standards Relating to Appointed Actuary Opinions with Respect to Use of Internal Models to Determine Required Capital for Segregated Fund Guarantees	February 7, 2013
212027	Educational Note: Reflection of Hedging in Segregated Fund Valuation	May 10, 2012
210053	Report: Report of the Task Force on Segregated Fund Liability and Capital Methodologies	August 11, 2010
207109	Educational Note: Considerations in the Valuation of Segregated Fund Products	November 22, 2007
205111	Educational Note: Valuation of Segregated Fund Investment Guarantees (Revised)	October 26, 2005
202012	Final Report: CIA Task Force on Segregated Fund Investment Guarantees	March 6, 2002
Universal Life		
212012	Educational Note: Valuation of Universal Life Insurance Contract Liabilities	February 28, 2012
Mortality and Mortality Improvement		
217097	Task Force Report on Mortality Improvement (Final)	September 20,2017
217097T	Task Force Report on Mortality Improvement (Final) – Excel File	September 20,2017

Accession Number	Title	Publication Date
217079	Final Communication of a Promulgation of Prescribed Mortality Improvement Rates and Associated Margins for Adverse Deviations within the Practice-Specific Standards on Insurance Contract Valuation: Life and Health (Accident and Sickness) Insurance (Subsection 2350) and the Accompanying Promulgation	July 30, 2017
217079T	Final Communication of a Promulgation of Prescribed Mortality Improvement Rates and Associated Margins for Adverse Deviations within the Practice-Specific Standards on Insurance Contract Valuation: Life and Health (Accident and Sickness) Insurance (Subsection 2350) and the Accompanying Promulgation – Excel Workbook	July 30, 2017
217054	Research Paper on Mortality Improvement Promulgation	May 17, 2017
217054T	Research Paper on Mortality Improvement Promulgation – Excel File	May 17, 2017
211070	Final Standards of Practice: Standards of Practice for the Valuation of Insurance Contract Liabilities: Life and Health (Accident and Sickness) Insurance (Subsection 2350) Relating to Mortality Improvement (clean version)	July 12, 2011
210065	Research Paper: Mortality Improvement Research Paper	September 23, 2010
202037	Educational Note: Expected Mortality: Fully Underwritten Canadian Individual Life Insurance Policies	July 8, 2002
Living Benefits		
218034	Research Paper: Model of Long-Term Health Care Cost Trends in Canada	March 14, 2018
Group Life and Health		
210069	Educational Note: Sources of Earnings Calculations – Group Life and Health	October 7, 2010
210034	Educational Note: Valuation of Group Life and Health Policy Liabilities	June 4, 2010
Lapse		
217019	Educational Note Supplement: Selective Lapsation for Renewable Term Insurance Products	February 16, 2017

Accession Number	Title	Publication Date
217019t	Educational Note Supplement: Selective Lapsation for Renewable Term Insurance Products - Illustration of Methods	February 16, 2017
Par and Adjustable		
214008	Educational Note: Dividend Determination for Participating Policies	January 9, 2014
214006	Final Standards – Revocation of the Current Standards of Practice Entitled Recommendations – Dividend Determination and Illustration and Explanatory Notes in Amplification of Certain Dividend Recommendations, and Introduction of a New Subsection Relating to Participating Policy Dividend Determination in Part 2000 – Practice-Specific Standards for Insurance	January 9, 2014
211123	Educational Note: Guidance on Fairness Opinions Required Under the Insurance Companies Act Pursuant to Bill C-57 (2005)	December 14, 2011
211084	Final Standards of Practice: Practice-Specific Standards for Insurance, Incorporation of Standard Wording for Fairness Opinions (subsection 2460)	September 7, 2011
Capital and DCAT		
218097	Revised Educational Note – Regulatory Capital Filing Certification for Life Insurers	July 12, 2018
218033	Educational Note: Life Insurance Capital Adequacy Test (LICAT) and Capital Adequacy Requirements for Life and Health Insurance (CARLI)	March 8, 2018
217121	Second Revision of Educational Note: Dynamic Capital Adequacy Testing	November 24, 2017
217018	Educational Note: Performance of DCAT in 2017 for Life and Health Insurers	February 9, 2017
216102	Notice of Intent to Review the Standards of Practice to Incorporate Changes Needed as a Result of the New Capital Standard	October 14, 2016
211108	Memorandum: Final Standards of Practice – Dynamic Capital Adequacy Testing – Section 2500 (with appendix)	November 11, 2011

Accession Number	Title	Publication Date
211107	Final Standard of Practice: Revision of the Standards of Practice – Dynamic Capital Adequacy Testing – Section 2500	November 11, 2011
209095	Research Paper: Considerations for the Development of a Pandemic Scenario	October 15, 2009
206048	Final Standards of Practice: Practice-Specific Standards for Insurers Subsection 2480 Regulatory Capital Filing Certification	May 24, 2006
Tax and Expenses		
212096	Educational Note: Future Income and Alternative Taxes	December 17, 2012
208004	Educational Note: Implications of Proposed Revisions to Income Tax Legislation (Nov 7, 2007 Department of Finance Proposal)	January 23, 2008
207029	Educational Note: Implications of *CICA Handbook* Section 3855 – Financial Instruments on Future Income and Alternative Taxes: Update to Fall Letter	April 11, 2007
206134	Educational Note: Best Estimate Assumptions for Expenses	November 8, 2006

Appendix B-1: 2011 Ed Note example (pre-tax basis, relevant for comparison of foreign NFI asset vs Canadian benchmark for similar asset class

Assumptions	Canada	Asset XYZ	XYZ Revised	
Historical Return				
Capital Growth	9.50%	17.00%	14.08%	<<-- solve for yellow highlighted cell such that green highlighted cell equal to annualized net spread for Canada
Dividends	2.50%	3.00%	3.00%	
Total	12.00%	20.00%	17.08%	
Risk Free Rate	4%	6%	6%	
Implied Spread	8.00%	11.00%	11.08%	
MfADs				
Capital Growth	20%	20%	20%	
Dividends	10%	20%	20%	
Shock (year 5)	30%	40%	40%	
Assumed Growth (pre-tax, after MfAD)				
Capital Growth	7.60%	13.60%	11.26%	
Dividends	2.25%	2.40%	2.40%	
Total	**9.85%**	16.00%	**13.66%**	

Calculations	0	1	2	3	4	5	6	7	8	9	10	annualized net return	risk free	annualized net spread
Canada	1,000.00	1,098.50	1,206.70	1,325.56	1,456.13	1,119.69	1,229.98	1,351.13	1,48[illegible]22	1,630.[illegible]2	1,791.01	6.00%	4%	**2.00%**
XYZ	1,000.00	1,160.00	1,345.60	1,560.90	1,810.64	1,260.20	1,461.84	1,695.73	1,967.[illegible]5	2,281.[illegible]3	2,[illegible]6.86	10.22%	6%	4.22%
XYZ Revised	1,000.00	1,136.64	1,291.95	1,468.48	1,669.14	1,138.32	1,293.86	1,470.66	1,671.61	1,[illegible]00.02	2,1[illegible].64	8.00%	6%	**2.00%**

Observations:

1. This example is a replication of the illustration in the 2011 Ed Note. None of the assumptions have been changed.
2. The "Canada" column represents the returns on a comparable asset class in Canada with a reliable benchmark
3. The "XYZ" column represents the assumed returns on a NFI asset in a foreign jurisdiction (where no reliable benchmark for a similar asset class exists)
4. The "XYZ Revised" column represents the adjusted assumed returns on the NFI asset, after calibrating the annualized net spread to the Canadian benchmark, ignoring taxes
5. The calculated annualized net returns in this example assume full reinvestment of dividends into the asset/benchmark (ie. compound growth)
6. In this example, the assumed holding period of asset XYZ is 10 years.
7. In this example, the resulting adjusted assumed growth rate (pre-tax, after MfAD) of 13.66% exceeds the Canadian benchmark of 9.85% because the risk free rate in the foreign jurisdiction is higher than in Canada, and because the assumed shock MfAD on XYZ exceeds the shock MfAD on the Canadian benchmark. Had these been equivalent, then the resulting adjusted assumed growth rate would have matched the Canadian benchmark

Appendix B-2: 2011 Ed Note example, enhanced to include impact of taxes for comparison of Canadian NFI asset (without reliable historical information) to accepted Canadian NFI benchmark

Assumptions	Canada	ABC	ABC Revised
Historical Return			
Capital Growth	9.50%	17.00%	9.88%
Dividends	2.50%	3.00%	3.00%
Total	12.00%	20.00%	12.88%
Risk Free Rate	4%	4%	4%
Implied Spread	8.00%	16.[illegible]%	8.88%
MfADs			
Capital Growth	20%	20%	20%
Dividends	10%	10%	10%
Shock (year 5)	30%	30%	30%
Assumed Growth (after-tax, after MfAD)			
Capital Growth	5.70%	10.20%	5.9[illegible]%
Dividends	2.25%	2.03%	2.0[illegible]%
Total	**7.95%**	12.23%	**7.95%**

<-- solve for yellow highlighted cell such that green highlighted cell equal to annualized net spread for Canada

Tax Rates	Canada	ABC	ABC Revised
Capital Growth	25%	25%	25%
Dividends	0%	25%	25%
Risk Free Returns	25%	25%	25%

Calculations:

	0	1	2	3	4	5	7	8	9	10	after-tax annualized net return	after-tax risk free return	after-tax annualized net spread
Canada	1,000.00	1,079.50	1,165.32	1,257.96	1,357.97	1,136.10	1,226.42	1,3[illegible]	1429.17	1,542.79	1,665.44	5.23%	3.00%	**2.23%**
ABC	1,000.00	1,122.25	1,259.45	1,413.41	1,586.20	1,379.59	1,548.24	1,737.[illegible]	1,949.9[illegible]	2,188.31	2,455.83	9.40%	3.00%	6.40%
ABC Revised	1,000.00	1,079.50	1,165.32	1,257.96	1,357.97	1,136.10	1,226.42	1,323.[illegible]	1,429.17	1,[illegible]2.79	1,665.44	5.23%	3.00%	**2.23%**

Observations:

1. The "Canada" column represents the returns on a Canadian benchmark for a similar asset class where reliable historical infor[illegible]on does exist - no change from 2011 example
2. The "ABC" column represents the assumed returns on a NFI asset in a Canada (where no reliable historical information exists for the given asset)
3. The "ABC Revised" column represents the adjusted assumed returns on the NFI asset, after calibrating the annualized after-tax net spread to the Canadian benchmark
4. The Canadian benchmark is assumed to receive tax-favourable treatment (ie. zero tax rate on dividends), whereas asset ABC returns are fully taxable
5. In this example, the risk free rate applicable to ABC is the Canadian rate, and the MfADs are assumed to be the same as for the Canadian benchmark (to isolate the impact of the tax effect)
6. The calculated annualized net returns in this example assume full reinvestment of dividends into the asset/benchmark (ie. compound growth), similar to the 2011 Ed Note example
7. Similar to the 2011 Ed Note example, the assumed holding period of asset ABC is 10 years.
8. In this example, the resulting adjusted assumed growth rate (after-tax, after MfAD) for ABC of 7.95% is equal to the Canadian benchmark of 7.95%.