Canadian Institute of Actuaries
Institut canadien des actuaires

Educational Note

Guidance for the 2015 Valuation of Insurance Contract Liabilities of Life Insurers

Document 215073

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Committee on Life Insurance Financial Reporting

September 2015

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Members should be familiar with educational notes. Educational notes describe but do not recommend practice in illustrative situations. They do not constitute standards of practice and are, therefore, not binding. They are, however, intended to illustrate the application (but not necessarily the only application) of the Standards of Practice, so there should be no conflict between them. They are intended to assist actuaries in applying standards of practice in respect of specific matters. Responsibility for the manner of application of standards of practice in specific circumstances remains that of the members.

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MEMORANDUM

To: Members in the life insurance practice area

From: Pierre Dionne, Chair
Practice Council

Rebecca Rycroft, Chair
Committee on Life Insurance Financial Reporting

Date: September 16, 2015

Subject: **Educational Note: Guidance for the 2015 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 2015 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, this educational note has been prepared by CLIFR, and has received final approval for distribution by the Practice Council on September 3, 2015.

As outlined in subsection 1220 of the Standards of Practice, "*The actuary should be familiar with relevant Educational Notes and other designated educational material*." That subsection explains further 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." As well, "Educational Notes are intended to illustrate the application (but not necessarily the only application) of the Standards of Practice, so there should be no conflict between them."

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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 in the last 12 months:

- Final Standards – Revisions to the General and Practice-Specific Standards – Consistency of Reporting and Conformance with International Standard of Actuarial Practice 1 (released December 9, 2014, and effective March 31, 2015).

Recent CLIFR guidance includes the following material:

- Research paper: Development of New Prescribed Interest Rate Scenarios for CALM Valuations (October 2014); and
- Educational note: Investment Assumptions used in the Valuation of Life and Health Insurance Contract Liabilities (September 2014).

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.

In addition, CLIFR expects to publish the following guidance in the near future:

- Revised Educational note: Investment Assumptions used in the Valuation of Life and Health Insurance Contract Liabilities (reissued in September 2015); and
- Research paper: Development of the Equilibrium Risk-free Market Curve for the Base Scenario.

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

The topics covered herein are:

If you have any questions or comments regarding this educational note, please contact Rebecca Rycroft at rebecca.rycroft@oliverwyman.com.

PD, RR

1. Experience Studies *(modified)*

The Research Committee has published the following studies.

- Mortality study – Canadian Standard Ordinary Life Experience 2012–2013 Using 86–92 Tables (July 2015)
- Mortality study – Canadian Standard Ordinary Life Experience 2012–2013 Using 97–04 Tables (July 2015)

  These reports submitted by the Individual Life Experience Subcommittee of the Research Committee detail the inter-company mortality experience for Canadian standard ordinary life insurance policies. They reflect the mortality experience of Canadian standard individual ordinary insurance issues between the 2012 and 2013 policy anniversaries. The CIA 86–92 and CIA 97–04 mortality tables were used to calculate the expected death claims for males and females and for smoker/non-smoker distinctions separately.

- Morbidity study – Canadian Individual Critical Illness Insurance Morbidity Experience Study Including Policy Anniversaries Between 2003 and 2011 Using Expected Incidence Rate Tables 2008 CANCI (December 2014)

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

- Mortality study – Individual Annuitant (June 2014)

  This study updates the 2000–2009 study published in 2012, but the information presented here does not require knowledge of the prior study. Seven companies contributed to the 2010–2011 study. 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.

- 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 to it. 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.

The Research Committee will publish the following studies in the near future:

- Lapse Experience under Term-to-100 Insurance Policies

  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 Experience under Universal Life Level Cost of Insurance Policies

  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.

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

There are no changes to the guidance for the 2015 year-end valuation.

In 2014, a task force was created under the Member Services Council, with representatives from the life insurance, annuity, pension and social security practices and an academic. The objective of this task force is to develop a best estimate mortality improvement assumption for the general population, and to determine whether adjustments are required for different population sub-groups.

In 2015, a new designated group of the Actuarial Standards Board was created, with members from the CLIFR subcommittee and the new task force. The mandate of this designated group is to:

- Review the appropriateness of the current subsection 2350 of the Standards of Practice on the best estimate mortality improvement rates and the level of margins to apply to the best estimate mortality improvement rates. All elements, including the best estimate mortality improvement rates, the level and structure of the margins, and the approach with the minimum and maximum will be considered.
- Provide additional guidance in subsection 2350 of the Standards of Practice on the definition of “appropriate level of aggregation” with regards to the impact of inclusion of mortality improvement to insurance contract liabilities.

The target timeline for the designated group is to complete their review in time for changes to be effective for the 2016 year-end valuation.

3. Accident and Sickness Insurance Mortality and Morbidity *(modified slightly)*

Mortality Improvement - Active Lives

The committee work to develop mortality improvement guidance did not consider accident and sickness insurance mortality improvement or morbidity trends directly. The mortality improvement trends for accident and sickness insurance are expected to be the same for the active lives within accident and sickness insurance as for life insurance and annuities. It is recommended that the actuary would consider mortality improvements using the current prescribed mortality improvement rates for the current year-end valuation for accident and sickness active lives.

In order to determine the minimum valuation assumption, the actuary would perform two valuations of active lives using the following mortality improvement scenarios. The first scenario would be expected to apply in situations where the reflection of mortality improvement decreases insurance contract liabilities, and the second where the effect is to increase insurance contract liabilities.

1. Mortality improvement would be projected for 25 years only from the valuation date using 50 percent of the base mortality improvement rates as described in the promulgation. After 25 years, no further mortality improvement would be reflected.
2. Mortality improvements would be projected for all future years using 150 percent of the base mortality improvement rates as described in the promulgation for 25 years and 100 percent of the base mortality improvement rates as described in the promulgation thereafter.

The prescribed mortality improvement rates would be the rates from the mortality improvement scenario producing the higher liability determined at an appropriate level of aggregation.

Mortality Improvement – Non-active Lives

The actuary may consider reflecting mortality improvement for non-active lives within accident and sickness insurance. However, given that the prescribed mortality improvement rates were developed using general population data, the minimum valuation assumption for mortality improvement rates does not apply to the valuation of non-active lives. Non-active lives are lives that are 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.

In 2014, CLIFR formed a subcommittee with a mandate to consider additional guidance relating to mortality improvement on non-active lives. The review was completed and concluded that there is no reason to broadly support the application of mortality improvement to non-active lives. The actuary would consider mortality improvements for non-active lives only if the actuary has rationale that the population of non-active lives will exhibit mortality improvement.

The publicly available evidence does not clearly support the view that mortality improvement applies to non-active lives. Two recent sources of publicly available data are documented herein:

- In 2013, the American Academy of Actuaries and Society of Actuaries jointly sponsored a working group to recommend a new statutory valuation basis for morbidity to the National Association of Insurance Commissioners. The working group had experience for the period 2000 to 2007 that did “not exhibit any discernible mortality improvement” (Individual Disability Valuation Standard Report of the Joint American Academy of Actuaries/Society of Actuaries Individual Disability Tables Work Group, December 2013).

- The Office of the Chief Actuary performed a study of Canada Pension Plan disability beneficiaries; this study concluded that mortality improvement drove a decrease in mortality from the beginning of the study period until 1997. The study is silent on the applicability of mortality improvement after 1997; however, the exhibits with post 1997 data do not show mortality improvement. The report quotes other potential drivers of stable mortality experience since 1997 so it is not possible to conclude that mortality improvement is absent. (Office of the Chief Actuary, Actuarial Study No. 9: CPP Experience Study of Disability Beneficiaries, September 2011).

Morbidity trends
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 morbidity trend demonstrates unusually high uncertainty and would warrant selection of a margin above the high margin as noted in paragraph 2350.04 of the Standards of Practice. When assessing the appropriateness of aggregate provision for adverse deviations (PfAD) levels, actuaries would consider the interrelationships of the assumptions and any potential undesirable compounding of provisions.

4. Economic Assumptions (*modified*)

Revisions to subsections 2330 and 2340 of the Standards of Practice pertaining to investment assumptions were made in 2014. A CIA educational note: "Investment Assumptions Used in the Valuation of Life and Health Insurance Contract Liabilities" (September 2014) was issued to provide guidance and support to actuaries in the application of the revised Standards of Practice.

Credit spreads
The educational note provides guidance on developing assumptions for credit spreads, including margins and limits. Two clarifications follow:

- The testing of the additional margin pertaining to the net credit spread limit (as defined in paragraph 2330.07.01) would be performed at the level at which the Canadian Asset Liability Method (CALM) liabilities are determined.
- Additional scenarios (as defined in paragraph 2330.30) are limited to varying risk-free interest rates and not credit spreads.

Equilibrium risk-free market curve
The educational note provides guidance on developing an "equilibrium risk-free market curve" used in the base scenario that would extend for at least 40 years from the balance sheet date. During 2015, CLIFR reviewed the construction of this equilibrium risk-free market curve to address considerations that had arisen in the implementation of the new Standards of Practice.

As a result of this review, CLIFR will be re-issuing the educational note: Investment Assumptions used in the Valuation of Life and Health Insurance Contract Liabilities (September 2014). The 2015 version of the educational note will remain unchanged from the 2014 publication, with the exception of the guidance provided for developing an equilibrium risk-free market curve extending beyond the current market curve and a clarification of the non-fixed income assets definition.

Further information on the development of the new guidance for extending the equilibrium risk-free market curve will be found in the CIA research paper: "Development of the Equilibrium Risk-free Market Curve for the Base Scenario" which will be published shortly. This research paper will include a spreadsheet to illustrate the development of the base scenario.

5. International Financial Reporting Standards (*modified*)

In June 2013 the International Accounting Standards Board (IASB) published the exposure draft Insurance Contracts for comments.

- IASB – Insurance Contracts, exposure draft, June 2013 and
- IASB – Insurance Contracts, basis for conclusions exposure draft, June 2013.

The final insurance contracts Standard is expected to be published after 2015, and the mandatory effective date will be after the effective date of IFRS 9 (Financial Instruments). The IASB is expected to allow adequate time for implementation and will consider whether it would be helpful to allow a longer period after IFRS 9 is mandatorily effective before the new insurance contracts Standard must be applied.

6. Segregated Funds (*modified slightly*)

Calibration of Investment Returns

Calibration criteria for fixed income returns were promulgated in 2014. A research paper that provides 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.

The promulgation for the calibration criteria for equity returns provides a decision tree for the application of the criteria. Case 2 involves a model test, and applies to indices other than broad-based equity indices and small capitalization stocks indices for which sufficient credible data are available. Broad-based real estate funds would fall under case 2, as the data available on real estate are deemed sufficient and credible.

Hedging

The hedging of segregated fund guarantees has become a common practice in the industry. The practice for recognizing hedging in insurance contract liabilities varies greatly across companies. Paragraph 2320.09 of the Standards of Practice states, "The actuary would usually apply the Canadian asset liability method to policies in groups that reflect the insurer's asset-liability management practice for allocation of assets to liabilities and investment strategy." Paragraph 2330.05 states, "The investment strategy for each scenario would be consistent with the insurer's current investment policy and would be consistent with the insurer's expected practice."

An educational note that provides guidance on approximation methods to account for hedging in the insurance contract liabilities, consistent with the above references, and that also provides guidance with respect to reflecting potential hedging weaknesses in insurance contract liabilities, was published in May 2012. The actuary would recognize hedging in the calculation of insurance contract liabilities.

Where a hedging program is in place, the 2007 educational note Considerations in the Valuation of Segregated Fund Products stated that negative insurance contract liabilities after issue are allowed, but "subject to constraints on the amount of profit capitalized, consistent with an unhedged position". Some companies have interpreted this by allowing insurance contract liabilities to be negative only to the extent that the gain from negative insurance contract liabilities is offset by cumulative losses from the hedge assets. CLIFR's view is that the following approach, which does not depend on the past performance of hedge assets, is consistent with the aforementioned statement. For a new cohort, the fee income allocated to the guarantee at the time of issue would be adjusted such that the initial insurance contract liability for the guarantee is equal to or greater than zero. Once established at issue, the adjusted fee income would be kept constant throughout the remaining life of the cohort. In future periods, the fee income allocated to the guarantee would be that established at issue and the liability for the guarantee would be allowed to move freely up or down, without regard to cumulative gains and losses from the hedge assets. A numerical example is provided in section 7.2 of the report of the Task Force on Segregated Fund Liability and Capital Methodologies.

In the case of a company implementing a hedging program for an in-force block of business, the same principle as for new business would apply, i.e., fee income allocated to the guarantee would be such that the liability for the guarantee post hedging is equal to or greater than zero. In future periods, the fee income allocated to the guarantee would be that established at the inception of the hedging program.

7. Selective Lapsation *(New)*

There are no changes to the guidance for the 2015 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 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. This subcommittee is expected to report its findings in 2016.

Appendix A: CIA Guidance

Accession Number	Title	Publication Date
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
214109	Research Paper: Development of New Prescribed Interest Rate Scenarios for CALM Valuations	October 10, 2014
214099	Educational Note: Guidance for Investment Assumptions Used in the Valuation of Life and Health Insurance Contract Liabilities	September 3, 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
214037	Revised Notice of Intent Regarding Standards of Practice for the Use of Models	April 22, 2014

Accession Number	Title	Publication Date
214034	Research Paper: Calibration of Fixed-Income Returns for Segregated Fund Liability	April 11, 2014
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
213107	Research Paper – Calibration of Stochastic Risk-Free Interest Rate Models for Use in CALM Valuation	December 21, 2013
213077	Revised Educational Note – Dynamic Capital Adequacy Testing	November 13, 2013
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
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
212096	Educational Note on Future Income and Alternative Taxes	December 17, 2012
212054	Memorandum: 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)	July 3, 2012
212027	Educational Note: Reflection of Hedging in Segregated Fund Valuation	May 10, 2012
212012	Educational Note: Valuation of Universal Life Insurance Contract Liabilities	February 28, 2012
212004	Research Paper: Calibration of Equity Returns for Segregated Fund Liabilities	February 3, 2012
211107	Final Standard of Practice: Revision of the Standards of Practice – Dynamic Capital Adequacy Testing – Section 2500	November 11, 2011

Accession Number	Title	Publication Date
211091	Final Standards of Practice: Standards of Practice for Recognizing Events in Work (clean version)	September 26, 2011
211084	Final Standards of Practice: Practice-Specific Standards for Insurance, Incorporation of Standard Wording for Fairness Opinions (subsection 2460)	September 7, 2011
211072	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)	July 12, 2011
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
211027	Educational Note: Investment Return Assumptions for Non-Fixed Income Assets for Life Insurers	March 1, 2011
211003	Final Communication of a Promulgation of Calibration Criteria for Investment Returns Referenced in the Standards of Practice for the Valuation of Policy Liabilities: Life and Health (Accident and Sickness) Insurance (Subsection 2360)	January 20, 2011
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
210065	Research Paper: Mortality Improvement Research Paper	September 23, 2010
210053	Report: Report from the Task Force on Segregated Fund Liability and Capital Methodologies	August 11, 2010
210034	Educational Note: Valuation of Group Life and Health Policy Liabilities	June 4, 2010
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
208004	Educational Note: Implications of Proposed Revisions to Income Tax Legislation (Nov 7, 2007 Department of Finance Proposal)	January 23, 2008

Accession Number	Title	Publication Date
207109	Educational Note: Considerations in the Valuation of Segregated Fund Products	November 22, 2007
207029	Educational Note: Implications of *CICA Handbook* Section 3855 – Financial Instruments on Future Income and Alternative Taxes: Update to Fall Letter	April 11, 2007
206147	Educational Note: Use of Actuarial Judgment in Setting Assumptions and Margins for Adverse Deviations	November 30, 2006
206134	Educational Note: Best Estimate Assumptions for Expenses	November 8, 2006
206133	Educational Note: Approximations to Canadian Asset Liability Method (CALM)	November 8, 2006
206132	Educational Note: Margins for Adverse Deviations	November 8, 2006
206077	Educational Note: CALM Implications of AcSB Section 3855 Financial Instruments – Recognition and Measurement	June 7, 2006
205122	Educational Note: Applicability of Rules, Standards and Other Guidance to CIA Members	November 30, 2005
205111	Educational Note: Valuation of Segregated Fund Investment Guarantees (Revised)	October 26, 2005
203106	Educational Note: Selection of Interest Rate Models	December 2003
203083	Educational Note: Aggregation and Allocation of Policy Liabilities	September 15, 2003
202037	Educational Note: Expected Mortality: Fully Underwritten Canadian Individual Life Insurance Policies	July 8, 2002