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MEMORANDUM

TO: All Life Insurance Practitioners
FROM: Micheline Dionne, Chairperson
Committee on Life Insurance Financial Reporting
DATE: November 2004
SUBJECT: **Guidance for the 2004 Valuation of Policy Liabilities of Life Insurers**

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The purpose of this letter is to provide guidance to actuaries in several areas affecting the valuation of the 2004 year-end policy liabilities of life insurers for Canadian GAAP purposes. The guidance in this letter represents a consensus view of members of the Committee on Life Insurance Financial Reporting (hereafter referred to as CLIFR in this note) of appropriate practice consistent with CIA Standards of Practice (Standards). As documented in the CIA Due Process paper (November 2001), this letter is “not binding”. This letter has not gone through due process and therefore is not part of the Standards.

CLIFR has published the Educational Note entitled “Approximations to the Canadian Asset Liability Method (CALM)” (September 2004). It provides guidance on the degree of rigour used in implementing the CALM and outlines considerations for the actuary’s use of approximations. The specific techniques discussed in it are illustrative examples. It does not provide an exhaustive list of approximation techniques.

Other recent CLIFR guidance includes:

Educational Note: Selection of Interest Rate Models (December 2003)

Educational Note: Valuation of Segregated Fund Investment Guarantees (December 2003)

Educational Note: Aggregation and Allocation of Policy Liabilities (September 2003)

Educational Note: Future Income and Alternative Taxes (December 2002)

Expected Mortality: Fully Underwritten Canadian Individual Life Insurance Policies (July 2002)

For your convenience all of these educational notes can be found on the CLIFR website in the members only section (Activities/Practice Services Council/Committees and Task Forces/Committee on Financial Reporting).

As outlined in Section 1220 of the Standards, the “*actuary should be familiar with relevant educational notes and other designated educational material,*” considering that a practice described “for a situation is not necessarily the only accepted practice for that situation and is not necessarily accepted actuarial practice for a different situation.”

The key topics covered in this letter are listed below. Some guidance provided last year is still appropriate, and has been duplicated in this letter. Other guidance has been slightly modified either to reflect recent developments, or to add clarity. In addition, new guidance is provided on other topics.

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1. Insurance Mortality Assumption (*Slightly modified*)

Standard 2350.07 states “The low and high margins for adverse deviations for the mortality rate per 1000 are respectively an addition of 3.75 and 15, each divided by the best estimate curtate expectation of life at the life insured’s age at the balance sheet date.”

Standard 2350.06 states “If the actuary’s best estimate assumption includes a secular trend toward lower mortality rates whose effect is to reduce the policy liabilities, then it is prescribed that the actuary negate that trend by an offsetting increase or decrease in what the actuary would otherwise select as a margin for adverse deviations.”

Accordingly, an expectation of future mortality improvement beyond the valuation date does not justify the use of a lower margin for adverse deviations that would be appropriate in the absence of such an expectation.

The margins for adverse deviations (MfADs) consists therefore of an addition of 3.75 to 15, divided by the best estimate curtate expectation of life at the life insured’s attained age¹ and the reversal of the secular trend towards lower mortality past the valuation date. This may result in a total dollar amount of provision for adverse deviation (PfAD), which exceeds the provision associated with the high margin ($15 / e_x$) under the previous standards, Life Standards of Practice (LSOP). The best estimate curtate expectation of life (e_x) would be calculated without the inclusion of a secular trend towards lower mortality rates. The implementation of the new Standards therefore does not affect the aggregate valuation results obtained from the previous LSOP.

Currently no guidance exists with respect to levels of future mortality improvement. CLIFR intends to publish such guidance in the near future and has commissioned a research study in concert with the Society of Actuaries (SOA) to help in this regard. In the Appointed Actuary’s report, the actuary is encouraged to clearly outline the best estimate base mortality assumption, the best estimate mortality improvement, if any, and the level of MfAD.

Standard 2350.03 states “The high margin is appropriate for a best estimate assumption based on industry experience as opposed to insurer-specific experience.”

Consistent with the Provision for Adverse Deviations paper, CLIFR believes that Standard 2350.03 has a broader interpretation and the intent is: “A margin set at the mid-point or higher is appropriate for a best estimate assumption based on industry experience as opposed to insurer-specific experience.” CLIFR wants to clarify that such practice was appropriate previous to the implementation of the Standards and is still appropriate today.

2. Death-Supported Insurance Policies (*Slightly Modified*)

With respect to death-supported insurance policies (i.e., policies where a decrease in mortality rates increases the policy liabilities), a negative MfAD (or mortality improvements) increases the policy liabilities.

¹The attained age is the age at the balance sheet and at any future date for which mortality is projected. In LSOP section 7.2.1, the life expectancy was defined as the curtate expectation of life, starting at the life insured’s attained age. Standard, section 2350.07 defines it as the best estimate curtate expectation of life at the life insured’s age at the balance sheet date. CLIFR believes the intention of the Standards drafters was not to change the LSOP definition and hence refers to the curtate expectation of life at the life insured’s attained age.

Death-supporting can occur when the amount ceded under a reinsurance treaty, currently or prospectively, exceeds the direct net amount at risk. This situation is not uncommon when high percentage quota share yearly renewable term (YRT) reinsurance arrangements ceding a level net amount at risk have been used for Term to 100 or Level Cost of Insurance (COI) Universal Life (UL) policies.

Other situations may create a similar dynamic and have the same impact on results.

It is suggested that the actuary ensure that the company's mortality PfAD is appropriate in aggregate. Section 2.3 (Aggregation to Take Into Account other than Interest Rate Risk Synergies) of the Educational Note titled "Aggregation and Allocation of Policy Liabilities" provides advice in this regard. Note that it is appropriate for the actuary to assume a negative mortality MfAD if this is necessary to produce a positive mortality PfAD at the chosen level of aggregation. If this is the case and mortality improvement is anticipated, the actuary does not reverse the provision for the future mortality improvement as such a reversal decreases the amount of liabilities (Standard section 2350.06). Furthermore, the actuary would ensure that sufficient mortality improvement has been factored in to reflect the anticipated improvement in mortality experience as the absence of reversal makes the mortality improvement assumption critical.

In applying this methodology, CLIFR recommends the grouping of products with similar characteristics. Sensitivity testing may be required to determine the proper application of the MfAD.

3. Preferred Underwriting Products (*Slightly modified*)

For products underwritten on a preferred basis, the mortality margins would be set to at least the average of the low and the high margins for years where no credible experience exists. For durations without credible experience, the margins are normally higher than the MfADs applied to standard regular underwriting mortality assumptions, at least until the effect of any preferred underwriting is assumed to wear off.

Another consideration to keep in mind in setting the mortality MfADs is that the recent market proliferation of preferred underwriting products may have impacted both mortality and persistency assumptions of products offered on a non-preferred basis, both for those currently being offered and those that have been sold in the past.

4. Annuity Mortality (*Modified*)

Standard 2350.11 states "It is prescribed that the actuary's best estimate includes a secular trend toward lower mortality rates as promulgated from time to time."

CLIFR has created a sub-committee to review the appropriateness of the mortality improvement scale AA. Until a recommendation from the sub-committee is received and approved, the existing mortality improvement scale AA continues as the improvement scale applicable to annuity business issued in Canada and in the US as per section 2350.11 of the Standards. This scale is applicable to both individual and group annuitants. CLIFR has commissioned a research study in concert with the SOA to review mortality improvement.

For markets other than Canada and the US, the improvement scale to be used in conjunction with annuitant mortality would be at least as conservative as the AA scale unless experience indicates otherwise.

For all jurisdictions, the use of higher rates of mortality improvements is appropriate if the experience indicates it is required.

5. Critical Illness (*Unchanged*)

When establishing expected claims assumptions, it is suggested that the actuary consider the level and quality of underwriting, the definition of insured events, and the ability to monitor experience. Diagnostic techniques have advanced and are likely to continue to advance and courts might widen their interpretation of definitions. Hence, it may be appropriate to apply morbidity deterioration factors to arrive at expected experience because historical claims' experience may not be indicative of future claims' experience.²

The actuary would need to be familiar with the underwriting standards, and the definitions of insured events, used to develop underlying experience studies or expected claims.

The actuary may wish to rely on the experience of other countries, but is cautioned to recognize differences (social or other) among countries.

In setting the level of the MfAD, the actuary considers many risk factors associated with critical illness contracts (e.g., medical advances, earlier detection, the ability of the company to change premiums or cancel contracts, medical changes in definitions of the insured conditions, or limited relevant experience).

The actuary would also consider expected lapse rates, especially the impact on lapses of any return of premium benefits or riders.

6. Scenario Assumptions – Interest Rates (*Modified*)

Standard 2320.08 states "*The scenarios of interest rate assumptions should comprise*

a base scenario which, unless otherwise promulgated, assumes continuance of reinvestment and inflation rates at the balance sheet date, and, unless there is explicit reason to assume otherwise, the insurer's then current investment strategy,

each of the prescribed scenarios in a deterministic application,

ranges which comprehend each of the prescribed scenarios in a stochastic application, and

other scenarios appropriate for the circumstances of the insurer."

CLIFR believes that the appropriate practice is to test the seven prescribed scenarios (Standard 2330.18 to Standard 2330.27) using the plausible range of default-free interest rates as defined in the Standards. For Canada, the plausible range is defined as 3% to 10% for short-term rates and 5% to 12% for long-term rates (Standard 2330.06)

The plausible range is extended whenever actual default-free interest rates at the balance sheet date approach or are outside the boundaries of the plausible range (Standard 2330.06). CLIFR believes that it is appropriate to address extensions to the plausible range through the testing of additional scenarios of the actuary's own design that are appropriate to the circumstances of the case (Standard 2330.28) and not by modifying the prescribed scenarios. In today's interest rate environment, the

² Consider the condition colloquially known as a "heart attack". Not long ago, the widely accepted diagnosis in the medical field of a heart attack was the presence of chest pain, the evaluation of cardiac enzymes, and recent changes in their ECG results. Now, the presence of a cardiac marker, troponin, is sufficient evidence to indicate that a heart attack has occurred.

actuary may wish to test an immediate 1% drop in interest rates followed by a gradual increase back into the plausible range as one such additional scenario.

In the context of deterministic testing in Canada, each of the prescribed scenarios is considered plausible and the actuary is required to establish policy liabilities that are not less than those required under the most adverse prescribed scenario (Standard 2320.50) at the level of aggregation selected.

CLIFR is concerned that the guidance on the selection of interest rate models for stochastic testing is limited³ and that no calibration criteria have been established. This may result in an inappropriately wide range of practice.

In the context of stochastic testing, the Conditional Tail Expectation (CTE) (60%) to CTE (80%) defines the range of policy liabilities (Standard 2320.51). CLIFR is currently working on an educational note on interest rate risk modelling and expects that this note will include calibration criteria. Pending their development, CLIFR recommends that the actuary continue to perform scenario testing using the seven prescribed scenarios in addition to the testing performed on a stochastic basis and consider holding actuarial liabilities at least equal to the result under the worst prescribed scenario. The decision to establish policy liabilities that are less than those required under the worst prescribed scenario needs to be supported by a clearly documented rationale.

In this context, CLIFR recommends that the actuary ensure the following:

- the stochastic interest rate model including any parameters required are appropriately selected for use in determining policy liabilities for Canadian life insurance financial reporting purposes;
- the range of stochastic scenarios encompasses the seven prescribed scenarios;
- the model parameters are reviewed to confirm their appropriateness if the policy liabilities required under the worst prescribed scenario are greater than the policy liabilities at CTE (80%); and
- the range of stochastic scenarios covers the range of plausible default-free interest rates including any extensions required to reflect actual interest rates at the balance sheet date that approach or are outside the boundaries of the plausible range as defined under Standard 2330.06.

7. Reinvestment Strategies (*Unchanged*)

Standard 2330.03 states:

“The investment strategy defines reinvestment and disinvestment practice for each type, default risk classification, and term of the invested assets which support policy liabilities. Assumption of the insurer’s current investment strategy implies investment decisions of reinvestment and disinvestment in accordance with that strategy and hence the risk inherent in that strategy.”

Standard 2330.12 states:

“For a prescribed scenario, if the net cash flow forecasted for a period is positive,..., the actuary may assume reinvestment in non-debt investments

not to exceed their proportion of investments at the balance sheet date if the insurer controls investment decisions and if such reinvestment is consistent with its investment policy, or

³ CLIFR recommends that the actuary be familiar with the educational note on the *Selection of Interest Rate Models* that was published in December 2003.

in the proportion expected to be selected by policyholders if policyholders control investment decisions.”

When using non-debt investments, the actuary would ensure that the proportion of non-debt investments, at each duration, is in accordance with the insurer’s current investment policies (regardless of whether net cash flows for the period are positive or negative). The review is performed without taking into consideration any businesses issued after the valuation date (new sales) even for a valuation done on a going concern basis as stipulated in Standard 2130.02.

This may create a situation where the actuary needs to divest non-debt investments. This disinvestment is not limited to non-debt instruments acquired after the valuation date.

CLIFR encourages the actuary to pay particular attention to the following situations:

- The overall investment limits may apply to more than one block of business for which separate CALM projections are done. The reserve pattern may vary significantly over time and/or the maturity of the blocks may be very different creating situations where it is more difficult to verify the application of the investment policy’s limits.
- The investment policy may include limits that vary over time. As an example, an investment policy may assume that investment in non-debt investments may be 20% of the total asset portfolio but reduces to 0% if the cash flows are within a certain number of years of maturity.
- The investment policy of some blocks of business may be more complex to model. As an example, modeling the investment policy of a UL Level COI block of business considers an investment strategy for the assets supporting the policyholder funds (under the control of the policyholders) and a different one for the insurance reserve (under the control of the company). Those two investment policies may be subject to different limits.

8. Withdrawal Margin for Adverse Deviations (*Slightly Modified*)

Section 2350.25 of the Standards states, in part: “The low and high margins for adverse deviations are respectively an addition or subtraction, as appropriate, of 5% and 20% of the best estimate withdrawal rates. In order to ensure that the margin for adverse deviations increases policy liabilities, the choice between addition and subtraction may need to vary by prescribed scenario age, policy duration, and other parameters.”

In establishing the margin for the withdrawal risk, the actuary would consider the spirit and intent of the standard, i.e., that the valuation results appropriately take into account the potential for the direction of withdrawal sensitivity to change by scenario, age, policy duration, and other parameters. However:

- It is appropriate for the actuary to strike a reasonable balance between the theoretical ideal and the practical constraints on valuation, and use his/her judgment as to the appropriateness and materiality of approximations used, and in the resulting level of MfADs selected.
- Sensitivity testing may be required to determine the proper application of the margin for adverse deviations (MfADs). The actuary does sufficient sensitivity testing to ensure that he or she understands the changes in exposure by parameters and can support the appropriateness and materiality of the approximations used.

Reasonable grouping of policies with similar characteristics can be applied for this purpose, however, it is generally not appropriate to group lapse-supported products with non-lapse-supported products. It is generally appropriate to combine blocks of business that exhibit similar characteristics within the context of sensitivity to withdrawals.

9. Lapse Study - Universal Life (*Unchanged*)

The CIA published a study on the Lapse Experience under Universal Life Level COI policies in June of 2003. The scope of the study was limited to guaranteed Level COI coverages. This study has significant amounts of experience for the first 5-policy durations. Unfortunately, the study does not include analysis by other UL-specific drivers (e.g., fund values, credited rates, interest environment, etc.). It is suggested that the actuary consider the applicability of this study to the business being valued.

Universal Life lapse-supported policies frequently exhibit some of the following characteristics:

- minimum funded policies,
- policies purchased for tax considerations,
- joint last to die,
- presence of persistency bonuses

and may result in ultimate lapse rates similar to the stand alone T-100 products.

The actuary reviews the degree of lapse support within its Universal Life portfolio and assesses the applicability of the CIA lapse study on lapse-supported products.

10. Balance Sheet Allowance for Acquisition Expenses (*Modified*)

Key References:

- Standard 2320.16 to 2320.27 inclusive which define “Term of the liabilities”;
- Standards 2320.23 and .24 in particular which define when it is appropriate to extend the “term” to offset acquisition expenses and criteria for amortization of deferred acquisition expenses respectively; and
- Educational Note titled “Aggregation and Allocation of Policy Liabilities” issued in September 2003.

Acquisition expenses are expenses incurred in the acquisition of new and renewal insurance policies and annuity contracts. They are expenses that are both primarily related to the acquisition of policies and contracts, and consistently allocated to new business in product pricing and internal company expense allocations.

For some types of contracts (e.g., segregated fund contracts), it may be reasonable to expect the insurer to recover acquisition expenses from revenue received beyond the term of the policy liabilities. In such circumstances, the cash flows for a policy may extend beyond the term of its policy liabilities, offsetting some or all remaining non-recovered portion of such acquisition expenses (Standard 2320.23).

However, this extension does not result in a more favourable balance sheet position than would be the case had no acquisition expense been incurred, and no extension of the cash flows beyond the term of the liability taken place.

Standard 2320.22 defines the term of the liability at the policy level. However, such a determination may not be practical and some level of aggregation may be warranted. The key consideration for determining the appropriate level of aggregation is the homogeneity of policies with respect to key risk parameters (market performance, product features, lapse, mortality, guarantee resets behaviour, and so forth). Recoverability testing is usually done at the same level of aggregation.

It would be good practice to identify and document the net future cash flows generated by the selected grouping of policies to offset the deferred acquisition expenses at issue of this grouping. These cash flows are the basis for establishing a locked in amortization schedule for the deferred acquisition expenses as per Standard 2320.24. The amortization schedule would result in a write-down pattern that is reasonably matched with the net cash flows available to offset expenses at inception.

Going forward, recoverability is tested at least annually as per Standard 2320.24. Recoverable means that the present value of remaining cash flows identified to amortize the Allowance for Acquisition Expense (AAE) is equal to or exceeds the remaining unamortized AAE balance. If the remaining unamortized AAE balance is not recoverable, then it is reduced to the level, which is recoverable, with the result of such reduction being a charge to income and the remaining future amortization charges being proportionately reduced.

There are two ways to value additional benefits or guarantees associated with policies for which an AAE is being amortized. The amount produced before AAE is reported as a policy liability only if it exceeds \$0 at the level of aggregation chosen:

1. Bifurcated Approach: Determine the policy liability using appropriate aggregate methodology (for the selected grouping) and the net cash flows available excluding those allocated to amortize the remaining unamortized AAE; or
2. Whole Contract Approach: Determine the policy liability using appropriate aggregate methodology (for the selected grouping) and all net cash flows available. To the preliminary result produced, add the current remaining unamortized AAE balance to get the policy liability for the additional benefits and guarantees.

11. Currency Risks (*Unchanged*)

Standard 2340.16 and 2340.17 address the determination of currency risks best estimates and margin.

AS further guidance, CLIFR recommends that the actuary develops an integrated multi-currency interest rate model to value a portfolio with a material currency mismatch (e.g., the use of an asset denominated in a currency that is different from the currency of the relevant policy liability). In developing the best estimate assumptions for foreign exchange rates, consideration is given to the inter-relationship between projected exchange rates and the projected best estimate interest rate differentials between the two countries. When establishing a PfAD in respect of a currency mismatch, it is suggested that the actuary consider the potential sources of currency exchange rate fluctuations such as under or over valuation of currencies, changes in productivity levels, supply shortage, excess capacities, terrorism acts, and wars.

12. Cyclical Credit Loss Provisions (*Unchanged*)

Provisions for expected credit losses typically represent long-term average expectations. They are derived from industry and insurer experience, and are modified considering factors outlined under the Standard 2340. In some circumstances, it may be reasonable to establish additional positive or negative short-term provisions or margins to reflect the impact of an economic cycle. A cyclical credit loss provision (CCLP) could be established by special modifications to the short-term cash flows, or as a separate stand-alone provision.

In keeping with the principles of the Standards, CLIFR's view is that the following guidelines reasonably apply to cyclical credit loss provisions:

1. For this purpose the economic cycle considered is relatively short term and is expected to be no more than five (5) years.
2. The determination of the provision is based on a forward-looking assessment of expected future credit losses.
3. The expected economic conditions are consistent with the expectations of the actuary and of the company's investment advisors.
4. Excess asset defaults attributable primarily to inadequate credit underwriting are provided within the expected long-term asset default assumption. Excess asset defaults clearly related to the deteriorating economic cycle would be considered in the cyclical credit loss provision.
5. The provision is calculated on a consistent basis from period to period.
6. The actuary establishes and documents a policy for cyclical credit loss provisions (CCLP). This policy addresses the purpose of the provision, how it is established and funded, and the criteria used to release amounts out of the provision.

In addition, the actuary ensures that the CCLP is determined consistently with the accounting provisions for credit losses and the base line credit loss provision in the policy liabilities as per Standard Section 2130.02.

13. Selection of CTE Coverage Level (*New*)

Sections 2320.51 and 2320.52 of the Standards describe the general approach of establishing the policy liabilities when the valuation uses stochastic methods. Specifically, the actuary adopts a scenario whose policy liabilities are within the range defined by CTE (60%) and CTE (80%). PfADs (in experience) are provided for in the policy liabilities (a) in the case of scenario-tested assumptions, by selection of the effective CTE coverage level, and (b) in the case of non-scenario-tested assumptions, through the application of explicit MfADs.

The suggested approach establishes the PfADs for stochastic variables (i.e., the scenario-tested assumptions) based on coverage of a plausible range of outcomes using the CTE risk measure. Establishing the appropriate CTE "coverage level" for the policy liabilities is an important consideration.

In selecting an appropriate margin, considerations are given to sources of uncertainties in the parameters and in the model. Greater uncertainties result in selection of a larger coverage level.

Parameter uncertainty

The parameters used in the stochastic model are necessarily estimates. Further uncertainty is introduced by several factors including the reliability of historical experience data to predict plausible future outcomes in terms of frequency and severity.

Model risk

Notwithstanding the provisions incorporated for the stochastic model processes and parameter uncertainty, some residual model uncertainty remains. As such, a margin for model error is typically needed. Sources of uncertainties include:

- basis risk;
- inability of the model to capture exactly all relevant contract terms;
- use of approximations whose conservatism is not well understood in the valuation scenarios;
- omission of known risk factors, which impact is not well understood in the valuation; and
- missing or unknown risk factors.

In deciding which coverage level is appropriate to account for the various components of uncertainty, the actuary would need to be particularly mindful of the margins in the valuation assumptions (explicit or otherwise) and the aggregate degree of conservatism in the model itself (including the parameters).

CLIFR is of the opinion that it would be inappropriate to make changes in the coverage level in the absence of clear documentation and consistent application within the range defined by the Standards. The issue of inappropriate volatility will be reviewed in 2005 and CLIFR is expecting to provide further guidance.

14. Long-Term Equity Returns (*New*)

Standard Section 2340.11 bounds the upper limit of the best estimate of investment return on a non-fixed income asset to a benchmark based on historical performance.

Due to the long-term nature of the liabilities normally backed by non-fixed income assets, the historical period considered is generally at least 25 years. However, when historical data is not available or it is not justifiable to use it, then some adjustments may be required.

The historical benchmark is routinely updated at least annually and includes the most recent data.

When using deterministic scenarios, the historical benchmark return is the geometric average of historical returns over a sufficiently long period. It is appropriate to use the geometric mean rather than the arithmetic mean due to the asymmetric distribution of long-term returns.

When using stochastic scenarios, the historical benchmark return is the arithmetic average of historical returns over a sufficiently long period, as the stochastic process captures the asymmetric distribution directly.

15. Cost of Minimum Interest Guarantees and Embedded Options (*Unchanged from 2002*)

With continuing low interest rates, it is suggested that actuaries assess and make appropriate provision for the cost of any minimum interest guarantees or other embedded economic options (e.g., guaranteed purchase options). These costs may not be appropriately captured in the deterministic base and prescribed scenarios within the Standard, as these scenarios may continue to ascribe zero cost to these features when in reality near or in the money guarantees or options can have substantial cost. Stochastic modelling or option pricing techniques (stochastic or mathematical) could, therefore, ascribe material cost to these features in the current interest environment. While the actuary is not required to model these features stochastically, the actuary would review the exposure to minimum interest guarantees and other embedded options in the business being valued, and determines whether an increase in the policy liabilities is warranted.

16. Renewable Term Lapses (*New*)

With the continuing trend to increasing the slope of renewal premiums on renewable term products, actuaries need to assess and make appropriate provision for both the overall level of lapses and the cost of any anti-selective lapses at renewal. Current experience on existing renewals may not be representative of expected experience on future renewals for more recent new issues given the significant increases in the guaranteed renewal rates.

Guidance on setting these assumptions can be found in the Educational Note: Expected Mortality: Fully Underwritten Canadian Individual Life Insurance Policies (July 2002).