Final

Final Standards for Practice-Specific Standards on Insurance Contract Valuation (Section 2300) to Narrow the Range of Practice on Certain Elements

Actuarial Standards Board

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2300 INSURANCE CONTRACT VALUATION: LIFE AND HEALTH (ACCIDENT AND SICKNESS) INSURANCE

2320 METHOD

.01 *The actuary should calculate insurance contract liabilities net of reinsurance recoverables by the Canadian asset liability method. For valuation of the general account insurance contract liability associated with segregated fund guarantees, the actuary should calculate the insurance contract liability for the guarantee elements by the Canadian asset liability method using stochastic modelling.* [Effective January 1, 2011]

.02 *The amount of insurance contract liabilities using the Canadian asset liability method for a particular scenario is equal to the amount of supporting assets, including reinsurance recoverables, at the balance sheet date that are forecasted to reduce to zero coincident with the last liability cash flow in that scenario.*

.03 *The term of the liabilities should take account of any renewal, or any adjustment equivalent to renewal, after the balance sheet date if*

the insurer's discretion at that renewal or adjustment is contractually constrained, and

insurance contract liabilities are larger as a result of taking account of that renewal or adjustment.

.04 *In forecasting the cash flow expected to be generated by the insurance contract liabilities, the actuary should*

take account of policy owner reasonable expectations, and

include policy dividends, other than the related transfers to the shareholders account and other than ownership dividends, in the comprised cash flow from benefits.

.05 *The actuary should calculate insurance contract liabilities for multiple scenarios and adopt a scenario whose insurance contract liabilities make sufficient but not excessive provision for the insurer's obligations in respect of the relevant policies.*

.06 *The assumptions for a particular scenario consist of*

scenario-tested assumptions, which should include no margin for adverse deviations, and

each other needed assumption, whose best estimate should be consistent with the scenario-tested assumptions and which should include margin for adverse deviations.

.07 *The scenario-tested assumptions should include at least the interest rate assumptions.*

.08 *The scenarios of interest rate assumptions should comprise*

a base scenario, as defined under paragraph 2330.09.1,

each of the prescribed scenarios in a deterministic application,

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

other scenarios appropriate for the circumstances of the insurer. [Effective January 1, 2011]

.08.1 *For stochastic modelling of segregated fund guarantees, the development of scenarios of investment returns should consider*

selection of market indices and proxies,

development of economic scenario generators and model parameters, and

calibration of investment returns (i.e., equity returns, bond fund returns and money market returns).

.08.2 *If the bifurcated approach is used for valuation of the general account insurance contract liability associated with segregated fund guarantees, the allocation of future fee revenue between amortization of the allowance for acquisition expense and the guarantee should not change from period to period.* [Effective January 1, 2011]

Liability grouping and asset segmentation

.09 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. That application is a convenience, however, that would not militate against calculation of insurance contract liabilities and reinsurance recoverables that, in the aggregate, reflect the risks to which the insurer is exposed.

Other methods

.10 For a particular scenario, another method may be equivalent to or approximate, the Canadian asset liability method. If the actuary uses that other method, then the calculation for multiple scenarios and the selection of one that makes sufficient but not excessive provision for the insurer's obligations would be the same as for the Canadian asset liability method.

.10.1 For valuation of the general account insurance contract liability associated with segregated fund guarantees, a factor-based approach, approved by a regulator, would be considered an appropriate approximation and the actuary would not need to undertake testing to determine the appropriateness of this approximation.

.10.2 Two approaches would be appropriate to value segregated fund policies where both additional benefits or guarantees are involved and the allowance for acquisition expense is being amortized.

> For the bifurcated approach, management expense cash flow is allocated between recoverability testing of the allowance for acquisition expense and the liability for the guarantee. The portion allocated to the guarantee would generally be based on the additional charge priced into the product for that guarantee with the remainder applied to amortize the remaining unamortized allowance for acquisition expense. The insurance contract liability for the guarantee is calculated separately using the net cash flows available for the guarantee while the recoverability of the allowance for acquisition expense is tested excluding those revenues allocated to guarantee.
>
> For the whole contract approach, all general account net cash flows associated with segregated funds are considered in calculating the total liability. This total liability will change over the reporting period as a result of market movements and other factors and, therefore, may need to be adjusted to remove any write-up to the balance of the allowance for acquisition expense.

Supporting assets

.11 In allocating assets to support liabilities, the actuary would preserve the connection between unamortized capital gains, both realized and unrealized, and the asset segments that generated them.

.12 The value of the assets that support insurance contract liabilities at the balance sheet date would be their value in the insurer's financial statements; i.e., book value, taking account of accrued investment income and of adjustments for impairment, amortized unrealized capital gains, and amortized realized capital gains.

.13 The forecasted cash flow of the assets would take account of any related, off-balance sheet, financial instruments.

.13.1 For valuation of segregated fund guarantees, the value of the assets and forecasted cash flow would take account of the insurer's hedging instruments existing at the balance sheet date.

.14 The forecast of cash flow from taxes would take account of permanent and temporary differences between the amortization of capital gains in accordance with generally accepted accounting principles and in accordance with tax law.

.15 The assumed cash flow from policy dividends would avoid omission and double counting. For example, if the dividend scale includes distribution of a deferred realized capital gain (adjusted for any corresponding future tax asset or liability), then the assumed cash flow from policy dividends would exclude that distribution. In the opposite case, the assumed cash flow from policy dividends would provide for negative distribution of a deferred realized capital loss asset (net of any corresponding future tax liability). Such avoidance is appropriate only in the case of liabilities and would not be appropriate if the dividend scale included distribution of assets that support capital, or distribution of investment income on assets that support capital.

Term of the liabilities

.16 If an element of a policy operates independently of the other elements, then it would be treated as a separate policy with its own term of liabilities. Examples are

> a flexible premium deferred annuity where the interest guarantee and cash value attached to each premium are independent of those for the other premiums, and
>
> a certificate of voluntary non-contributory association or creditor group insurance.

.17 The term of a policy's liabilities is not necessarily the same as the contractual term of the policy.

.18 In this context,

> "renewal" means the renewal of a policy at the end of its term, with the insurer having discretion to adjust premiums or coverage for the new term,
>
> "adjustment" means an insurer's adjustment to a policy's coverage or premiums equivalent to that in a renewal, and
>
> "constraint" means a constraint on the insurer's exercise of discretion in renewal or adjustment that results from contractual obligations, legally binding commitments and policy owner reasonable expectations. Examples of constraint are an obligation to renew a policy unless renewal is refused for all other policies in the same class, a guarantee of premiums, a guarantee of credited interest rate, a general account guarantee of segregated fund value, and a limitation on the amount of adjustment. "Constraint" would not include a price-competitive market expected at renewal or adjustment.

.19 The term of a policy's liabilities takes account of all renewals and adjustments before the balance sheet date. Depending on the circumstances, that term may also take account of one or more renewals or adjustments after the balance sheet date.

.20 If the term of the liabilities is not evident, and if selection of a longer term would reduce insurance contract liabilities, then the actuary would be cautious in making such a selection. On the other hand, if selection of a longer term would increase those liabilities, then the actuary would usually select the longer term. Substance would supersede form in the selection; for example, a universal life policy that is in form an annual premium life insurance policy may be in substance a single premium deferred annuity.

.21 The term of the liabilities of

an insurance contract that has been cancelled by the insurer ends at the effective date of cancellation,

an insurance contract that has not been cancelled, but that is cancellable by the insurer at or before the date to which its premiums have been paid, ends at that date,

an individual annual premium life or accident and sickness insurance contract ends at the last day to which the policy owner may prolong its coverage without the consent of the insurer, and

a certificate of group insurance if the group insurance contract is in effect a collection of individual insurance contracts is the same as if it were an individual insurance contract, unless contributions or experience rating of the group negate anti-selection by certificate holders.

.22 The term of the liabilities of any other insurance contract ends at the earlier of

the first renewal or adjustment date at or after the balance sheet date at which there is no constraint, and

the renewal or adjustment date after the balance sheet date that maximizes the insurance contract liabilities.

An exception to the above would exist for the liabilities for guarantees of the fund value for segregated fund annuities where the contracts contain material constraints. In this situation, the term of the liability ends at the date after the valuation date which maximizes the insurance contract liabilities, consistent with the treatment for contracts with no material constraints.

.23 The actuary would extend such term only

to permit recognition of cash flow to offset acquisition or similar expenses,

whose recovery from cash flow that would otherwise be beyond such term was contemplated by the insurer in pricing the insurance contract, and

where the value of the additional cash flow recognized by such extension of the term cannot exceed the value of the remaining balance of acquisition or similar expenses, or

to permit reflection of hedging arrangements related to segregated fund guarantees by considering both the value of the liability and its associated hedge,

where the resulting balance sheet presentation is consistent with market movements over the reporting period, and

where such extension would be subject to constraints on the amount of cash flow capitalized, consistent with an unhedged position.

.24 The balance of the allowance for acquisition expense would be written down to zero using an appropriate method. Such method would

have a term consistent with the extended term established at inception,

have a write-down pattern reasonably matched with the net cash flow available to offset these expenses at inception, and

be locked in, so that the amount of write-down in each period will not fluctuate from the expected amount established at inception provided such balance is recoverable from the additional cash flow recognized at the balance sheet date, and where not fully recoverable at the balance sheet date, is written down to the recoverable amount, with the expected amount of write-down in each future period proportionately reduced.

.25 That implies that the term ends at

the balance sheet date if the policy is continually renewable or adjustable without constraint,

the first renewal or adjustment after the balance sheet date if there is no constraint at that renewal or adjustment, and

a renewal or adjustment determined by testing for any other policy. The actuary would calculate the insurance contract liabilities assuming that the term of its liabilities ends at each renewal or adjustment at or after the balance sheet date up to and including the first renewal or adjustment at which there is no constraint, and would select the term corresponding to the largest insurance contract liabilities.

.26 A change in the outlook may provoke a change in the term of the insurance contract's liabilities. For example, the constraint of a cost of insurance guarantee that previously lengthened the term of the insurance contract liabilities may no longer do so if the outlook for mortality improves. On the other hand, the constraint of a guaranteed credited interest rate that previously was considered innocuous may become meaningful, and thereby lengthen the term of the insurance contract liabilities, if the outlook changes to one of lower interest rates.

.27 For example, the term of the liabilities ends at

the balance sheet date for the general account portion of a deferred annuity with segregated fund liabilities but without minimum guarantees (other than a guarantee of an annuity purchase rate); for example, with no guarantee of the segregated fund value,

the date after the balance sheet date that maximizes the insurance contract liabilities for guarantees of the fund value for segregated fund annuities whose contracts have no material constraints, and for consistency, for those contracts that contain material constraints,

the first renewal (usually one year after the previous renewal) of a group policy that insures employee benefits, unless there is a constraint at that renewal, and

the next renewal date or adjustment date even if there is a constraint at renewals and adjustments at and after that date, but the constraint is so weak that its operation does not increase insurance contract liabilities.

Policy owner reasonable expectations

.28 The insurer's policies define contractually its obligations to its policy owners. The contractual definition may leave certain matters to the insurer's discretion, such as

the determination of policy dividends, experience-rating refunds, and retrospective commission adjustments, and

the right to adjust premiums.

.29 Matters left to the insurer's discretion implicitly include

underwriting and claim practices, and

the right to waive contractual rights and to create extra-contractual obligations.

.30 Policy owner reasonable expectations are the expectations that

> may be imputed to policy owners as their reasonable expectations of the insurer's exercise of discretion in those matters, and
>
> arise from the insurer's communication in marketing and administration, from its past practice, from its current policy, and from general standards of market conduct. Past practice includes the non-exercise of discretion; for example, long non-exercise without affirmation of a right to adjust premiums may undermine it. The insurer's communication includes policy dividend and investment performance illustrations at sale of a policy and that of intermediaries reasonably perceived as acting in its behalf.

.31 In selecting assumptions for the insurer's exercise of discretion in those matters, the actuary would take policy owner reasonable expectations into account. Taking account of policy owner reasonable expectations may affect not only the amount of insurance contract liabilities but also disclosure in the financial statements.

.32 The determination of policy owner reasonable expectations is straightforward when the insurer's practice has been clear, unvarying, consistent with its communications, consistent with general standards of market conduct, and the insurer does not intend to change it. The actuary would discuss any other practice with the insurer, with a view to clarifying policy owner reasonable expectations.

.33 If the insurer makes a change that will eventually alter policy owner reasonable expectations, then the actuary would consider both the appropriate disclosure of the change in policy owner communication and the financial statements, and the time elapsed before the altered expectations crystallize.

.34 A dispute over policy owner reasonable expectations may lead to class action or other litigation by policy owners against the insurer, which may affect insurance contract liabilities or generate contingent liabilities.

Policy dividends

.35 The assumed cash flow from policy dividends would be that from both periodic (usually annual) dividends and terminal and other deferred dividends, but excluding that from the related transfers from the participating to the shareholders account in a stock insurer.

.36 The assumed cash flow from policy dividends would avoid omission and double counting with other elements of the insurance contract liabilities and with liabilities other than insurance contract liabilities. For example, if the actuary has valued the insurance contract liabilities for riders and supplementary benefits in participating policies as though they were non-participating — i.e., with provision for adverse deviations in excess of that appropriate for participating insurance – then the assumed cash flow from policy dividends would exclude the portion of that excess that is included in the dividend scale.

.37 The selected policy dividend scales in a particular scenario would be consistent with the other elements of that scenario, but would take account of how insurer inertia, policy owner reasonable expectations, and market pressure may preclude the dividend scale from being responsive to changes assumed in the scenario. Those scales would also be consistent with the insurer's dividend policy except in a scenario which that policy does not contemplate and which would provoke a change in it.

.38 If the current dividend scale anticipates a future deterioration in experience, then the actuary would assume continuance of that scale in response to that deterioration. If the current dividend scale does not respond to a recent deterioration in experience but the insurer's policy is to do so, and if the delay in doing so does not provoke a contrary policy owner reasonable expectation, then the actuary would assume such response.

.39 An assumption of cash dividends to all policy owners is appropriate only if the alternative options to cash have equivalent value, failing which, the actuary would

either adjust the cash dividends to reflect the non-equivalence or make explicit assumption about policy owner exercise of the various dividend options, and

provide for the anti-selection that will result from increasing exercise of the more valuable options.

Forecast of cash flow

.40 In calculating insurance contract liabilities, the actuary would allocate assets to the liabilities at the balance sheet date, forecast their cash flow after that date, and, by trial and error, adjust the allocated assets so that they reduce to zero at the last cash flow.

.41 Use of the work of another person may be appropriate for forecasting the cash flow of certain assets, such as real estate.

Income tax and alternative tax

.42 This item deals with cash flow from tax based on income (herein called "income tax") and other taxes not based on income but which interact with income tax; for example, certain capital taxes in Canada (herein called "alternative tax").

.43 The cash flow from such taxes would be limited to that in respect of the relevant insurance contracts and the assets that support their insurance contract liabilities, and thus, with the exception of the recoverability of future tax losses described below would ignore any interaction between that cash flow and cash flow in the rest of the insurer; e.g., it would ignore tax on investment income from assets that support the insurer's capital. For a particular scenario, forecasted income before tax is equal to zero in each accounting period after the balance sheet date. That is so because that scenario assumes occurrence of the adverse deviations for which it makes provision. If income according to tax rules were equal to income in accordance with generally accepted accounting principles, and if there were no alternative tax, then the corresponding forecasted tax cash flow would also be equal to zero. In reality, however, such tax cash flow may differ from zero because of

differences – both temporary and permanent – between income in accordance with generally accepted accounting principles and in income in accordance with tax rules,

the operation of carry-forward and carry-back in the tax rules, and

alternative tax and the interaction between it and income tax.

.44 An example of a temporary difference is a difference between insurance contract liabilities and the corresponding tax liabilities.

.45 An example of a permanent difference is a preferential tax rate on the investment income on a class of assets.

.46 The forecast of cash flow from such taxes would therefore take account of positive or negative tax as a result of permanent and temporary differences at, and arising after, the balance sheet date, and of alternative taxes incurred after the balance sheet date.

.47 The resulting insurance contract liabilities make appropriate provision for cash flow on account of such taxes. If the insurer's balance sheet records a future tax asset or liability in respect of such taxes, then, in order to avoid double counting, the actuary would adjust the insurance contract liabilities otherwise calculated upward to reflect the existence of the future tax asset and downward to reflect the existence of future tax liability.

.48 The realization of negative tax depends on the simultaneous availability of income that is otherwise taxable. In forecasting such income, the actuary would

make provision for adverse deviations,

take into account the projected tax position of the company overall, but

not take account of the expected release of provisions for adverse deviations in the insurance contract liabilities because, as noted above, their calculation implicitly assumes that those adverse deviations occur.

Adverse deviations borne by policy owners

.49 The insurance contract liabilities need not make provision for adverse deviations to the extent that the insurer can offset its effect by adjustments to policy dividends, premium rates, and benefits. The insurer's contractual right of such offset may be constrained by policy owner reasonable expectations, competition, regulation, administrative delays, and the fear of adverse publicity or anti-selection.

.49.1 In some jurisdictions, regulatory approval may be required for the application of such contractual pass-through features and, in such cases, the actuary would consider the ability to recover past losses, the clarity of any regulatory rules for approval, time delays caused by the approval process, and whether interest losses during this period can be recouped in determining an appropriate total provision.

Adoption of a scenario

.50 If the selection of scenarios is deterministic, then the actuary would adopt a scenario whose insurance contract liabilities are within the upper part of the range of the insurance contract liabilities for the selected scenarios, provided, however, that the insurance contract liabilities would not be less than those in the prescribed scenario with the largest insurance contract liabilities.

.51 If the selection of scenarios is stochastic, then the actuary would adopt a scenario whose insurance contract liabilities are within the range defined by

> the average of the insurance contract liabilities that are above the 60^{th} percentile of the range of insurance contract liabilities for the selected scenarios, and
>
> the corresponding average for the 80^{th} percentile.

Scenario-tested assumptions

.52 The provision for adverse deviations in respect of scenario-tested assumptions results from calculating the insurance contract liabilities for multiple scenarios and adopting a scenario whose insurance contract liabilities are relatively high.

Other assumptions

.53 The provision for adverse deviations in respect of each assumption other than the scenario-tested assumptions results from a margin for adverse deviations included in that assumption.

.54 The assumptions unique to a particular scenario are the scenario-tested assumptions and each other assumption that is correlated with them. For example, policy dividends and the exercise of options by borrowers and issuers are strongly correlated with interest rates. Lapses may be correlated or not, depending on the circumstances. The assumption on a matter not so correlated would be common to all scenarios.

Margin for adverse deviations

.55 The margin for adverse deviations would be at least the average of the applicable high and low margin whenever at least one 'significant consideration' exists, or at least one other consideration is significant in the context of the valuation. Significant considerations vary by type of assumption and are described under subsections 2340 and 2350.

2340 OTHER ASSUMPTIONS: ECONOMIC

Margin for adverse deviations

.00.1 Significant considerations indicating difficulties in properly estimating the best estimate assumption would include

there is little relevant experience,

future experience is difficult to estimate,

operational risks adversely affect the likelihood of obtaining the best estimate assumption,

asset underwriting criteria are weak or poorly controlled,

there are liquidity concerns,

there is uncertainty regarding the credit enhancement techniques used,

the trust structure and legal responsibilities of the different parties for a securitized asset are not clearly understood in a practical and/or legal sense,

the asset held is from a non-passthrough structure with a repackaging of the credit risk that is difficult to understand,

the asset held is from a lower quality tranche of a non-passthrough structure that repackages credit risks,

there is uncertainty about the counterparty credit, or

there is no netting of the aggregate exposure with a counterparty.

.00.2 Other significant considerations indicative of a potential deterioration of the best estimate assumption would include

there is significant concentration of risks and/or lack of diversification, or

operational risks are present such that the likelihood of continuing to obtain the best estimate assumption is adversely impacted.

Fixed income assets: Investment return

.01 The forecast of cash flows from a fixed income asset would be the promised cash flows over the term of the asset, modified for asset depreciation and borrower and issuer options.

Fixed income assets: Asset depreciation

.02 The actuary's best estimate of asset depreciation would depend on

asset type, credit rating, liquidity, term, and duration since issue,

subordination to other debt of borrower or issuer,

the insurer's credit underwriting standards, diversification within a particular type of investments, to the extent that it is indicative of the future, the insurer's own experience,

the insurance industry's experience,

guarantees that offset depreciation, such as that in an insured mortgage, and

potential for anti-selection by borrowers and issuers.

.03 Asset depreciation comprises that of both assets that are impaired at the balance sheet date and assets that become impaired after the balance sheet date, and includes loss of interest, loss of principal, and expense of managing default.

.04 Asset depreciation is likely to be relatively high after the forced renewal of a mortgage loan; i.e., one where the mortgagor can neither pay, nor find an alternative mortgagee for the balance outstanding at the end of its term but is able to continue its amortization. The explicit forecasting of subsequent cash flow is usually so conjectural that, to commute the cost of that asset depreciation to the end of the term of the mortgage would be an acceptable approximation unless it undermines the interest rate assumption in the scenario.

.05 The actuary would not necessarily assume that the best estimate of asset depreciation is less than the premium of an asset's investment return over the corresponding default-free interest rate.

.06 The low and high margins for adverse deviations for a scenario would be respectively 25% and 100% of the best estimate for that scenario, except that

a higher range would be appropriate where those percentages of an unusually low best estimate are not meaningful, and

zero would usually be appropriate for an Organisation for Economic Cooperation and Development (OECD) government's debt denominated in its own currency.

.07 Repealed

Fixed income assets: Exercise of borrower and issuer options

.08 Examples of borrower and issuer options are the option to prepay a mortgage loan, to extend the term of a loan, and to call a bond.

.09 The assumed exercise may depend on the interest rates in the scenario. Anti-selection by commercial borrowers and issuers would usually be intense.

.10 Forecasted cash flows would include any penalty generated by exercise of an option.

Non-fixed income assets: Investment return

.11 Where reliable historical data is available the actuary's best estimate of investment return on a non-fixed income asset would not be more favourable than a benchmark based on historical performance of assets of its class and characteristics.

.12 Where the best estimate is based on reliable historical data, the low and high margins for adverse deviations in the assumptions of common share dividends and real estate rental income would be respectively 5% and 20%.

.13 Where the best estimate is based on reliable historical data, the margin for adverse deviations in the assumption of common share and real estate capital gains would be 20% of the best estimate plus an assumption that those assets change in value at the time when the change is most adverse. That time would be determined by testing, but usually would be the time when their book value is largest. The assumed change as a percentage of market value

of a diversified portfolio of North American common shares would be 30%, and

of any other portfolio would be in the range of 25% to 40% depending on the relative volatility of the two portfolios.

.13.1 Where reliable historical information is not available for the class of assets, the actuary would select a best estimate investment return assumption and margins for adverse deviations such that the assumed return in excess of risk free interest rates, net of margins, would not exceed the assumed return in excess of risk free interest rates, net of margins, for a similar asset class for which reliable historical information is available in the same jurisdiction, or in Canada if there is no relevant reliable historical information in the same jurisdiction.

.14 Whether the assumed change is a gain or loss would depend on its effect on benefits to policy owners. A capital loss may reduce insurance contract liabilities as a result of that effect.

Taxation

.15 The best estimate would be for continuation of the tax regime at the balance sheet date, except that the best estimate would anticipate a definitive or virtually definitive decision to change that regime. The margin for adverse deviations would be zero.

Foreign exchange

.16 The needed assumptions would include foreign exchange rates when insurance contract liabilities and their supporting assets are denominated in different currencies.

.17 The base scenario used to develop the assumption for foreign exchange rates would be based on currency forwards. If currency forwards are not available, the forward exchange rates would be derived based on risk-free interest rate differentials where available. If neither is available, the actuary would use his or her best judgment to develop an appropriate approach.

.18 A provision for adverse deviations would be developed from a scenario using adverse movements in the exchange rate. Such movements would reflect the historical volatility in the exchange rate over the applicable period. The provision for adverse deviations would be the excess of the insurance contract liabilities based on this adverse scenario over the insurance contract liabilities calculated using the base scenario.

.19 A minimum provision for adverse deviations would apply. This would be the excess of the insurance contract liabilities resulting from the application of an adverse five percent margin to the projected exchange rates underlying the base scenario over the insurance contract liabilities calculated using the base scenario.

2350 OTHER ASSUMPTIONS: NON-ECONOMIC

Margin for adverse deviations

.01 The actuary would select a margin for adverse deviations between a low margin and a high margin

specified for each best estimate assumption discussed below, and

of 5% and 20% (or –5% and –20%), respectively, of each other best estimate assumption.

.02 If a margin for adverse deviations cannot be defined as a percentage of the best estimate assumption, then the related provision for adverse deviations would be taken as the increase in insurance contract liabilities that results from substitution of a conservative assumption for the best estimate assumption.

.03 Significant considerations indicating difficulties in properly estimating the best estimate assumption would include

the credibility of the company's experience is too low to be the primary source of data,

future experience is difficult to estimate,

the cohort of risks lack homogeneity,

operational risks adversely impact the likelihood of obtaining best estimate assumption, or

the derivation of the best estimate assumption is unrefined.

.03.1 Other significant considerations indicative of a potential deterioration of the best estimate assumption would include

a significant concentration of risks and/or lack of diversification,

operational risks that adversely affect the likelihood of continuing experience which is consistent with the best estimate assumption, or

past experience that may not be representative of future experience and the experience may deteriorate.

Other significant considerations may exist, but are tied to specific assumptions. Where applicable, they are described below.

.04 A selection above the high margin would be appropriate, however, for unusually high uncertainty or if the resulting provision for adverse deviations is unreasonably low because the margin is expressed as a percentage and the best estimate is unusually low.

Insurance mortality

.05 The actuary's best estimate of insurance mortality would depend on

the life insured's age, sex, smoking habit, health, and lifestyle,

duration since issue of the policy,

plan of insurance and its benefits provided,

the insurer's underwriting practice (that of its reinsurer for facultative reinsurance), including, if applicable to the policy, the absence of underwriting or less stringent underwriting for a group of simultaneously sold policies,

the size of the policy, and

the insurer's distribution system and other marketing practice,

and would include the effect of any anti-selection.

.05.1 The actuary would consider the inclusion of mortality improvement (a secular trend toward lower mortality rates) in the best estimate assumption and associated margin. The margin for adverse deviations related to the mortality improvement assumption is not restricted to the range of 5% to 20% noted in paragraph 2350.01.

.06 If the inclusion of mortality improvement reduces the insurance contract liabilities, then the resulting reduction would be no greater than that developed using prescribed mortality improvement rates as promulgated from time to time by the Actuarial Standards Board. If, at an appropriate level of aggregation, the inclusion of mortality improvement increases the insurance contract liabilities, then the actuary's assumption would include such improvement. The resulting increase in insurance contract liabilities would be at least as great as that developed using prescribed mortality improvement rates as promulgated from time to time by the Actuarial Standards Board.

.07 The low and high margins for adverse deviations for the mortality rates per 1,000 would be respectively an addition or subtraction, as appropriate, of 3.75 and 15, each divided by the curtate expectation of life at the life insured's projected attained age. These margins for adverse deviations are applied after mortality improvement.

.08 Repealed

Annuity mortality

.09 The actuary's best estimate assumption of annuity mortality would depend on

the annuitant's age, sex, smoking habit, health, and lifestyle,

size of premium,

plan of annuity and its benefits provided, and

whether registered or not, whether structured settlement, and whether group or individual contract,

and would include the effect of any anti-selection resulting from the annuitant's option to select the timing, form, or amount of annuity payment, or to commute annuity payments.

.10 The insurance underwriting in a "back-to-back" insurance/annuity package may unfavourably affect the best estimate.

.11 The mortality improvement assumption would include a best estimate assumption and an associated margin. The margin for adverse deviations related to the mortality improvement assumption is not restricted to the range of 5% to 20% noted in paragraph 2350.01. The actuary's assumption would include mortality improvement, the effect of which is to increase insurance contract liabilities, such that the resulting increase would be at least as great as that developed using prescribed mortality improvement rates as promulgated from time to time by the Actuarial Standards Board.

.12 The low and high margins for adverse deviations for the mortality rates would be respectively a subtraction of 2% and 8% of the best estimate.

.13 An additional significant consideration for the determination of the level of margin for adverse deviations would be the possibility of commuting survival dependent benefits after periodic payments have started.

Morbidity

.14 The actuary's best estimate of insurance morbidity would depend on

the life insured's age, sex, smoking habit, occupation, industry, health, and lifestyle,

duration since issue of the policy,

in the case of income replacement insurance, definition of disability, unemployment levels, and, in the case of an outstanding claim, cause of disability,

plan of insurance and its benefits provided, including elimination period, guarantees, deductibles, coinsurance, return-of-premium benefits, and benefit limits, indexation, and offsets,

the insurer's underwriting practice (that of its reinsurer for facultative reinsurance), including, if applicable to the policy, the absence of underwriting or less stringent underwriting for a group of simultaneously sold policies,

the insurer's administration and claim adjudication practice,

the size of the policy,

seasonal variations,

in the case of group insurance, participation level, and

environmental factors, such as a change in the offset to government benefits,

and would include the effect of any anti-selection.

.15 If the actuary selects a higher than usual best estimate of disability incidence because of an outlook for a high level of unemployment, he or she would not necessarily select a concomitant higher than usual best estimate of disability termination.

.16 Repealed

.17 The low and high margins for adverse deviations would be, respectively, an addition of 5% and 20% of the best estimate of morbidity incidence rates, and a subtraction of 5% to 20% of the best estimate morbidity termination rates. The actuary's selection would reflect any expected correlation between incidence and termination rates.

.18 Additional significant considerations to be taken into account when determining the level of margin for adverse deviations would include

the contract wording not tight enough to protect against medical advances,

definitions of claim events not precise and/or not protecting against potential anti-selection, or

interpretation of claim event definitions by the court uncertain.

Withdrawal and partial withdrawal

.19 The actuary's best estimate of withdrawal rates would depend on

policy plan and options,

the life insured's attained age,

duration since issue of the policy,

method of payment and frequency of premiums,

premium paying status,

policy size,

the policy's competitiveness, surrender charges, persistency bonuses, taxation upon withdrawal, and other incentives and disincentives to withdrawal,

policy owner and sales representative sophistication,

the insurer's distribution system and its commission, conversion, replacement, and other marketing practices, and

the interest rate scenario,

and would include the effect of any anti-selection.

.19.1 For the valuation of segregated fund guarantees, the actuary's best estimate of withdrawal rates would also depend on

extent to which the guaranteed values are greater or less than the market value of the funds,

time to maturity,

systematic withdrawal consistent with the contractual terms of the policies,

market conditions, and

distribution of investment income from the funds if such amounts are not automatically reinvested.

.20 The insurer's withdrawal experience would be pertinent and usually credible. It would not be available for new products and for higher durations on recent products, which is a problem for the actuary if the insurance contract liabilities are sensitive to withdrawal rates.

.21 The automatic payment of insurance premiums by the annuity benefit in a "back-to-back" insurance/annuity package would be a disincentive to withdrawal.

.22 Reinsurance assumed withdrawal rates would depend on practice in the direct insurer.

.23 A "cliff" is a sudden significant increase in the benefit available at withdrawal. That increase may result from increase in cash value, decrease in surrender charge, or availability of a maturity benefit or persistency bonus. Unless there is pertinent persistency experience data to the contrary, the actuary's best estimate withdrawal rates would grade to zero as the cliff approaches and remain at zero for an interval before the cliff is reached. The same would apply to a return of premium benefit in life insurance and to one in accident and sickness insurance, with modification in the latter case if the benefit is contingent upon zero claims or reduced by the amount of claims.

.24 The actuary's best estimate withdrawal rate would be zero for a paid-up policy without non-forfeiture benefit.

.25 The low and high margins for adverse deviations would be, 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 insurance contract liabilities, the choice between addition and subtraction may need to vary by interest scenario, age, policy duration, and other parameters. In the case of partial withdrawal, two assumptions would be needed, the amount withdrawn and the partial withdrawal rate.

.26 Additional significant considerations to be taken into account when determining the level of margin for adverse deviations in situations where a decrease in lapse rates increases the insurance contract liabilities would include

remuneration policy encouraging persistency, or

cancellation of a contract being clearly detrimental to the policy owner.

.26.1 Additional significant considerations to be taken into account when determining the level of margin for adverse deviations in situations where an increase in lapse rates increases the insurance contract liabilities would include

remuneration policy encourages terminations,

cancellation of a contract would be clearly beneficial to the policy owner,

company's contracts have provisions where rating decreases may trigger additional withdrawals, or

there is no market value adjustment on withdrawals for deposits and deferred annuities.

Anti-selective lapse

.27 Strictly speaking, "lapse" means termination of a policy with forfeiture, but in the context of anti-selection has come to include any termination or the election of the extended term insurance non-forfeiture option. "Anti-selective lapse" is a tendency of policies on healthy insured lives to lapse or unhealthy insured lives not to lapse, with a concomitant deterioration in the insurer's mortality or morbidity experience. To determine whether the tendency has operated in a particular case would require either a re-underwriting of those who have lapsed and those who have not, or a study of the mortality among those who lapsed, neither of which is likely to be practical. Policy owners will, however, make decisions in their own perceived interest, so that anti-selective lapse is plausible whenever that perceived interest is for policies on unhealthy lives not to lapse or for policies on healthy lives to lapse.

.28 It is difficult to estimate with confidence the intensity of anti-selective lapse. It is plausible for the intensity to be proportional to the intensity of policy owner perceived interest. However, anti-selective lapse is merely a tendency provoked by the policy owner's perceived interest. The policy owner may not know the true state of health of the life insured. The policy owner may imprudently favour, or be obliged by financial pressure to adopt, a short-term interest with long-term detriment; thus, a policy on an unhealthy life may lapse when the premium increases, the policy owner perceiving the policy to be no longer affordable. Through ignorance or inertia, a policy on a healthy life may be continued by a policy owner, even though it could be replaced by a superior one. Moreover, anti-selective lapse is not the unvarying effect of a decision in the policy owner's perceived interest. For instance, a policy owner may lapse a policy on an unhealthy life, if the policy is no longer needed, or the policy on a healthy life may remain in force if the policy owner perceives a continuing need. Without pertinent and reliable experience, however, the actuary would not assume that the non-lapsation of policies on healthy lives favourably affects the mortality best estimate for the persisting insurance contracts.

.29 The premise to the actuary's assumptions would be that policy owners' decisions

will tend to serve their perceived interest, and

will not serve the insurer's interest unless the two run together.

.30 Examples where the perceived interest of the policy owners of policies with healthy life insureds may be to lapse include

premium increase at renewal of term insurance,

unfavourable underwriting decision at renewal of re-entry term insurance,

benefit decrease or premium increase of adjustable insurance,

premium needed to avoid termination of universal life insurance with exhausted funding,

reduction in policy dividend scale,

offer or availability of a superior replacement policy, such as by the creation of preferred underwriting class,

significant but temporary increase (spike) in non-forfeiture value, and

downgrade in the insurer's credit rating.

Expense

.31 The actuary would select a best estimate assumption that provides for the expense of the relevant policies and their supporting assets, including overhead. The insurer's other expense is irrelevant to the valuation of insurance contract liabilities. Other expense would include

expense related to policies that, for the relevant policies, was incurred before the balance sheet date, such as marketing and other acquisition expense, and

expense not related to the relevant policies and their supporting assets, such as investment expense for the assets that support capital.

.32 The assumption would provide for future expense inflation consistent with that in the interest rate scenario.

.33 A stable insurer's expense experience is pertinent if its expense allocation is appropriate for valuation of insurance contract liabilities (or if the actuary can correct the inappropriateness, e.g., by reallocating corporate expense to operating lines of business).

.34 A particular insurer may have an expectation of reduced expense rates, but the actuary would anticipate only a reduction that is forecasted with confidence.

.35 Investment expense comprises

administration expense, both internal and external,

expense related to investment income, such as deferred fees and commissions and direct taxes, and

interest on money borrowed to finance investment.

.36 The insurer incurs neither cash rental expense nor cash rental income on real estate that it owns and occupies. The actuary would deem such expense and, if the real estate supports the insurance contract liabilities, such income at a reasonable rate in the selection of an assumption of expense and investment return.

.37 Certain taxes are akin to expenses. The actuary would make similar provision for them in the insurance contract liabilities to the extent that they relate to the relevant insurance contracts and their supporting assets. They include both premium taxes, which are straightforward, and taxes whose basis is neither income nor net income but which may be complicated by a relationship with income tax; for example, those currently incurred may be offset against later income tax.

.38 The low and high margins for adverse deviations would be respectively 2.5% and 10% of best estimate expense including inflation thereof. No margin for adverse deviations is needed for a tax, such as premium tax, whose history has been stable.

.39 Additional significant considerations to be taken into account when determining the level of margin for adverse deviations would include

distribution of general expenses by line of business, by product, or by issue and administrative expenses is not based on a recent internal expense study,

allocation is not an appropriate basis for the best estimate expense assumption,

expense study does not adequately reflect the appropriate expense drivers, or

future reductions in unit expenses (before inflation) are assumed.

Policy owner options

.40 Examples of policy owner options are options to

purchase additional insurance,

convert term to permanent insurance,

select the extended term insurance non-forfeiture option,

make partial withdrawal from a universal life insurance policy,

select the amount of premium for a flexible premium policy, and

purchase an annuity at a guaranteed rate.

.41 The actuary would select a best estimate assumption of policy owner exercise of both contractual options and extra-contractual options of which they have reasonable expectations.

.42 The actuary's best estimate would depend on

life insured's attained age,

duration since issue of the policy,

plan of insurance and its benefits provided,

historical premium payment patterns,

method of premium payment,

sophistication of the policy owner and the intermediary,

perceived self-interest of the policy owner and the intermediary,

policy's competitiveness, and

insurer's distribution system and other marketing practice,

and would make provision for anti-selection.

.43 The actuary would make provision for adverse deviations by testing the effect on insurance contract liabilities of plausible alternative assumptions of policy owner exercise of options and adopting one with relatively high insurance contract liabilities.

Maturities

.44 For valuation of segregated fund guarantees, the actuary would assume the contract terminates on maturity unless allowing a proportion of the policy owners to roll their contracts over would increase the insurance contract liabilities. The proportion of policy owners that elect to roll their policies over would take into account the experience of the insurer. The actuary would test future maturity dates that the policy owner may elect and would use caution in setting this maturity date assumption.

Management expense ratios and/or charges

.45 For valuation of segregated fund guarantees, the actuary would select a best estimate assumption for management expense ratios (including all taxes charged to the fund such as GST) that varies by fund according to the terms of the contract and recent practice of the insurer. The actuary would not assume a change in management expense ratios in the future unless there is a clear and justifiable reason for doing so, taking into account past practices, competitive pressures and reasonable policy owner reactions.

Fund transfers (switching/exchanges)

.46 For valuation of segregated fund guarantees, the actuary would test the effect of fund transfers and shifting asset mix and would exercise caution in assuming that the status quo would be maintained indefinitely.

Future optional deposits

.47 For valuation of segregated fund guarantees, the actuary would test the effect of future optional deposits to the extent they can reasonably be anticipated and use caution in assuming that the status quo would be maintained indefinitely.

Ratchet and reset rates

.48 For valuation of segregated fund guarantees, the actuary's best estimate of rates at which ratchet and reset options are exercised by policy owners would depend on the

extent to which the guaranteed values are greater than the market value of the funds,

relationship of the fund value and guaranteed benefit amounts,

term to maturity, and

growth of funds.

.49 If resets are discretionary, the actuary would assume that some proportion of policy owners would elect to exercise the reset option when it is in their financial best interest to do so. The actuary need not assume that all policy owners would act with absolute efficiency in an economically rational manner. However, the assumptions would allow the frequency of elective resets to vary according to the current and/or historical economic environment.

Related Assumptions

.50 The actuary would consider how the assumptions may be interrelated in determining the best estimate assumptions and appropriate margins. In determining these interrelationships the actuary would take account of potential anti-selection. For example, the actuary would consider

> the extent to which an increase in partial withdrawals on segregated funds might lead to deferrals in benefit commencement dates, and
>
> what the relationships among term conversions, withdrawals and mortality might be as a contract nears the end of a term renewal period.

Other examples of how potential anti-selection might affect the selection of assumptions are provided above and in section 1700.