

Final

**Final Standards – 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)**

Actuarial Standards Board

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