ACTUARIAL SOCIETY OF HONG KONG

Actuarial Guidance Note 9: Best Estimate Assumptions

1. BACKGROUND AND PURPOSE

1.1 Best estimate assumptions are an essential and important component of actuarial work. The key stakeholders of actuarial investigations, including but not limited to boards of directors, management, regulators, auditors, rating agencies and customers place reliance on the results of actuarial calculations based on best estimate assumptions regarding future experience and outcomes. Best estimate assumptions are often the base or a necessary point of reference for other assumptions, such as prudent assumptions. This Actuarial Guidance Note applies in such cases, in respect of the underlying best estimate assumptions, and the use of the term “best estimate assumptions” is intended to cover all such cases.

1.2 Appropriate assumptions for actuarial investigations are therefore critical in enabling stakeholders to make informed decisions in respect of their specific objectives. Inadequate actuarial analyses, inappropriate judgments and misapplication of actuarial principles can result in inappropriate assumptions being used and incorrect conclusions being drawn.

1.3 As an "Actuarial Guidance Note", as defined under Article 1 in the ASHK's Articles of Association, members are not bound to comply with the guidance contained herein. However it is incumbent upon the actuary to make timely written and reasoned disclosure to the intended users of the actuarial investigation if for any reason he or she does not comply fully with this guidance.

1.4 In applying this guidance, the actuary need not provide comments on each individual assumption set out in this note if such individual assumption is clearly not applicable to the investigation being carried out. Similarly, the actuary should not see the list of assumptions set out in this note as being exhaustive. In any particular situation there may be other relevant assumptions that should be taken into account.

2. SCOPE

2.1 The guiding principles documented in this note are intended to be generic and are applicable to all actuarial investigations requiring the setting of best estimate assumptions, including but not limited to:

i) valuations;

ii) product pricing;

iii) policyholder bonus / dividend setting;

iv) benefit illustrations;

v) business planning;

vi) strategic analysis; and

vii) financial projections generally.

3. GENERAL PRINCIPLES

3.1 “Best estimate” is generally considered to be the mean outcome across a range of potential future outcomes. In some cases the median might be more appropriate. If the actuary uses the median, he or she should specify and support the reasons for choosing this basis.

3.2 Best estimate assumptions used should be appropriate to the purpose of the actuarial investigation being conducted and reflect any relevant external factors such as economic conditions, as well as company, class and/or product-specific circumstances. These may include but are not limited to:

i) the company's strategy and management principles, policies and practices;

ii) the characteristics of the class of business and/or company's products and the associated assets backing such classes/products;

iii) the company's operational environment (including all applicable legislation and regulations) and experience; and

iv) the materiality of the assumptions.

3.3 The actuary should have due regard to consistency in setting best estimate assumptions. Consistency should be considered between various aspects of a set of assumptions, including but not limited to: between individual related assumptions within a set of assumptions, between related investigation types, between related lines of business, or over time. The principle of consistency might not necessarily require particular assumptions to be the same or to follow a pre-defined relationship, but the actuary should exercise care to reflect reasonably expected relationships between assumptions or sets of assumptions where applicable.

3.4 It is generally accepted that historical experience is a relevant point of reference in setting best estimate assumptions. However, owing to differences in target market, ownership structure, management philosophies, investment strategy, expertise, sophistication, experience, risk capacity and risk appetite, two products or portfolios of products with very similar policy provisions may be managed very differently between insurers. Historical information is retrospective in nature and may not reflect the prospective impact of any enhancement, deterioration, or change in a company's strategy, circumstances and policies (such as investment, underwriting and claims policies), product and distribution characteristics, the business environment and the economic outlook. An appropriately generated set of best estimate assumptions should reflect all of these elements. More specifically, in addition to the principles discussed in paragraph 3.2, the following should be considered when setting assumptions:

i) the assumptions should be appropriate to the nature of the cash flows of the underlying product and/or asset(s);

ii) the suitability of historical or current data (whether internal or external to the company) should be judged with respect to its relevance, reliability and credibility;

iii) when suitable data is lacking, assumptions may be derived in a reasonable and appropriate manner by referencing more suitable data internally (such as from similar policy features, similar policyholder profiles, or other similar aspects/classes of business) or externally (such as relevant industry data or overseas studies);

iv) when assumptions reflect a view of the future that is materially different from historically observed experience, e.g. changes in target policyholder mix, such differences should be flagged and sufficient reasoning should be presented to support the differences;

v) the assumptions should be reviewed periodically to ensure their continued appropriateness and suitability, and with reference to appropriate materiality considerations.

3.5 Economic assumptions

3.5.1 Whereas life insurance products are often long term in nature, the term to which the economic assumptions relate should be consistent with the expected term of the product under investigation.

3.5.2 Economic assumptions in relation to a portfolio of assets should consider each asset type within the portfolio separately, before combining them with appropriate assumptions in respect of the current and future portfolio composition.

3.5.3 Assumptions may vary by time horizon, with differences between near term and long-term expectations.

3.5.4 Where stochastic calculations are being carried out, assumptions may also be required for volatility and correlations.

3.5.5 Best estimate economic assumptions should therefore be set and reviewed regularly, in respect of major asset classes, reflecting near term and long-term expectations.

- Near term assumptions for individual asset classes are generally based on market observations and thereby objectively reflect current economic conditions (for example, yields on US government bonds and HKD Exchange Fund Notes). Near term assumptions should be refreshed at least annually or when a new actuarial investigation is performed if material.
- Long-term economic assumptions should reflect estimates of different market attributes that are considered justifiable over the longer term. These assumptions should be derived with reference to relevant inputs such as long-term historical data, academic analyses and expert opinions where appropriate. Assumption setting requires careful consideration of a range of potential future outcomes, and should avoid reaching spurious conclusions simply by using point estimates from historical data. Under normal circumstances, long-term assumptions should be reviewed at least every three years, but, these should also be reviewed if there are any material changes in economic conditions.
- The transition between near term and long-term assumptions should be appropriate, with reference to market views and historical observations.

3.5.6 In setting economic assumptions appropriate consideration should be given to:

i) accounting rules (e.g. market value or book value);

ii) default costs;

iii) spreads over risk-free rates;

iv) investment expenses;

v) foreign exchange rates;

vi) taxation in all forms, including direct, indirect and withholding tax;

vii) transaction costs; and

viii) relevance of economic cycles and the appropriate time horizon.

3.5.7 The starting point for setting economic assumptions may be the expected outlook for yields available on government bonds, both in the near term and long term. This requires considerable judgment, especially in the longer term. The actuary should consider the opinions of other professionals in setting such assumptions, including investment professionals and/or economists, forecasts from recognised experts, policies of central banks, etc.

3.5.8 The methodology for deriving assumptions for each asset type will vary. For example:

- The return on a portfolio of government bonds should be derived from the underlying yields, allowing for any difference in the maturity profile of bonds and the investment horizon and taking into consideration any applicable accounting rules;

- For a portfolio of corporate bonds, the return calculation should include assumptions regarding the weighted average corporate spreads net of default costs; and
- Equity and property returns may be derived in a way that is consistent with government bonds yields plus risk premia that are consistent with the profile of the portfolio of equities and properties respectively.

3.5.9 The overall investment return across all asset types requires assumptions to be made as to the future portfolio composition. This should reflect the company's stated intentions (in terms of the investment policy and the strategic asset allocation) and ongoing behaviors (such as frequency of portfolio rebalancing across asset types). Where the future asset mix is expected to change materially away from the current and historical mixes, the actuary should assess the appropriateness of reflecting the new asset mix.

3.5.10 The overall investment return of a portfolio or investment fund should reflect the current underlying assets as well as the effect of future expected cash inflows and outflows. Reflecting future cash inflows and outflows requires assumptions to be made in areas including but not limited to premium income, commissions, management expenses, taxation and benefit payments (from both inforce and projected new business), cashflows generated from the asset portfolio (both existing assets and assumed future investments), and capital flows into and out of the fund.

3.5.11 Insurance funds generally invest in a range of asset classes to diversify investment risk. This is an important strategy to generate a balanced fund return that is not overly exposed to one particular market. Where the overall portfolio investment return is derived with respect to the mean of a wide number of potential different outcomes, the assumed future outcomes should allow for portfolio volatility and correlations between asset types.

3.5.12 Salary level and salary inflation assumptions are required for projections of defined benefit pension schemes. These assumptions should be set consistently within the overall economic basis for the valuation. In particular, the actuary should take into consideration consumer price inflation and its long-term trends observed within the local economy. Salary scales should take into consideration age and other factors that may be relevant to the sponsor's policy, the scheme membership's own experience (if credible and relevant) and such external data as industry benchmarks. Adjustments may be required in respect of expectations for future valuations that may differ from historical levels.

3.5.13 Expense assumption inflation is discussed in paragraph 3.6.3.3 below.

3.6 Non-economic assumptions

Non-economic assumptions are generally set with reference to company-specific views and historical observations, as opposed to views from the capital markets, but they may also make reference to industry experience and other external benchmarks.

3.6.1 Mortality and morbidity

3.6.1.1 When setting mortality and morbidity assumptions, the actuary should make reference to the insurer's own historical mortality and morbidity experience, if relevant and credible, potentially separately by risk class and underwriting basis.

3.6.1.2 To the extent that the insurer's actual experience is not sufficiently credible and relevant, the actuary should consider using other credible industry experience locally or overseas, appropriately modified to reflect the insurer's underwriting practices, policyholder profiles, and claims handling procedures.

3.6.1.3 When setting best estimate assumptions the actuary may allow for emerging or expected future trends and changes, such as general mortality improvement or deterioration, and any changes in underwriting and claim management practices. Such changes may apply differently by age, gender, cohort, and/or other policyholder characteristics.

3.6.1.4 The actuary should consider the interplay between mortality and morbidity assumptions where relevant.

3.6.2 Lapse and other policyholder behaviours

3.6.2.1 The actuary should base persistency assumptions on the insurer's actual experience, if credible and relevant. To the extent that the insurer's recent experience is not credible or not relevant, the actuary should consider using other credible industry experience, appropriately modified to reflect the actuary's professional judgment regarding differences between products, distribution channels, policyholder profiles, and the underlying basis of the industry experience.

3.6.2.2 Other decrements which are similar to lapse are conversion to Extended Term Insurance (ETI), conversion to Reduced Paid UP (RPU), conversion of an annuity option or other policy option, premium holiday, partial withdrawal, top-up payments, renewal rates, and premium increments. The considerations in setting assumptions for these policyholder behaviours are similar to those for lapse as above.

3.6.3 Expense and commission

3.6.3.1 The expense assumptions should be determined based on the company's current experience and reasonable principles of expense allocation. The actuary should determine the extent to which prior experience may be reflected in expected future experience, in particular allowing for such factors as:

i) expense overruns;

ii) non-recurring expenses;

iii) developing trends;

iv) corporate reorganisation;

v) expense reduction initiatives;

vi) expense allocation changes including but not limited to drivers, channels splits, fixed versus variable, and acquisition versus maintenance; and

vii) special situations such as synergies from a recent acquisition.

3.6.3.2 In setting expense assumptions the actuary should take account of management's plans and budgets for future periods and assess the reasonableness of those plans in light of past experience.

3.6.3.3 The rate of fixed expense inflation should be considered unless the company can demonstrate that no inflation of expenses has been observed based on actual experience. Where appropriate, the actuary may consider different expense inflation assumptions for different expense categories. For instance, medical expense inflation may require a different assumption to general expense inflation.

3.6.3.4 Commissions should be considered in a similar way, but with direct reference to contractual obligations and the company's own commission scales. Other considerations when setting best estimate future commission assumptions are sales volumes (e.g. for overrides), sales profiles (e.g. where different channels have different commission rates), and commission clawback arrangements. Adequate allowance should also be made for non-commission sales-related expenses.

3.6.4 Sales mix

To the extent sales mix will impact the actuarial investigation, sales mix assumptions should be set based on the actuary's best estimate new business mix and, if available, in line with the Company's approved business plan.

3.6.5 Non-life insurance claims ratios

3.6.5.1 When setting claims assumptions for non-life insurance applications, e.g. setting ultimate loss ratios, or selecting initial expected loss ratios in the context of credibility weighted reserving / pricing methods, the actuary should consider the insurer's historic experience, if credible and relevant.

3.6.5.2 Where appropriate historic experience is available as a basis for setting assumptions, the actuary should consider what adjustments, if any, need to be made. The nature of the required adjustments will depend on the purpose of the investigation. For example, pricing analysis will often require allowances for changes in terms and conditions over time; adjustments for policy limits or premium rates over time; as well as an overlay of trends including inflation or changes in sales mix discussed in paragraph 3.6.4.

3.6.5.3 Where an insurer's experience, even after adjustment, lacks statistical credibility, the actuary should consider using relevant local industry data or from other related markets, adjusted to reflect the actuary's professional judgment regarding differences in future experience expected to result from the different profiles of the business considered.

3.6.6 Non-life insurance large and catastrophic losses

It is accepted that forecasting estimates in respect of large losses and/or catastrophic events is challenging.

3.6.6.1 Where estimates are being developed in respect of *retrospective* events, it is advisable to discuss the specific details of the event(s) with the relevant claims, legal and/or loss adjustment personnel involved with processing the claim. Particular focus should be directed to policy-level outcomes and how these can influence the eventual losses. Non-life insurance often utilises non proportional and aggregate reinsurance loss covers. Consequently, the resultant reinsurance recoveries require specific consideration and allowances for aggregation prior to netting-down may be appropriate.

3.6.6.2 When setting allowances for large loss or catastrophic events on a *prospective* basis, e.g. pricing loads, the actuary should consider the results of exposure-based analysis where available. This may involve consideration of simple metrics such as estimated and probable maximum losses together with an appropriate estimated probability assigned to the loss or reliance on more refined analyses such as drawing on the results of scenario and or simulation modelling (e.g. realistic disaster scenarios or proprietary catastrophe model outputs). Where simulation results are being used and where market share approaches are relied upon, consideration of the associated basis risk should be made.

3.6.7 Defined benefit pension business

For projections related to defined benefit pension business a number of additional non-economic assumptions need to be derived including rates of early voluntary retirement, rates of early or late retirement due to disability or other reasons, and withdrawal rates. The scheme's experience where credible and relevant should be considered as should wider industry data appropriately adjusted based on the actuary's professional judgment to reflect any specific differences in the underlying populations.

3.6.8 General

3.6.8.1 There are a variety of other assumptions that may be required depending upon the nature of the products involved and the investigation. These may include, for example, average charges for unit linked policies, policyholder bonus/dividend rates for participating business, the rate at which policyholders take up options where these exist in the underlying products, etc.

3.6.8.2 In setting such assumptions the actuary should ensure consistency across the full assumption set, and should have careful consideration for situations where the likely experience for one assumption is closely related to that for other assumptions. For example, the takeup rate of a particular option is likely to be closely related to the value of that option under the projected economic scenario.

3.6.8.3 For any non-economic assumption where there is lack of credible and relevant experience, the actuary should consider whether industry experience, overseas experience or other data such as reinsurance rates available in the market could form the basis for a best estimate assumption. In such cases the emerging experience should be monitored closely and the assumption should be updated as soon as it becomes clear that the experience is not consistent with the existing assumption.

4. SPECIFIC CONSIDERATIONS

4.1 Despite the general principles discussed, it is anticipated that special considerations and adjustments are inevitable for different types of actuarial investigation.

4.2 The appendices to this Actuarial Guidance Note 9 ("AGN 9") form an integral part hereof and should also be considered and applied to specific conditions accordingly.

5. COMMENCEMENT DATE

This AGN 9 shall become effective on 1 April 2016.

***** END OF ACTUARIAL GUIDANCE NOTE *****