Institute of Actuaries of Australia

LIFE INSURANCE & WEALTH MANAGEMENT PRACTICE COMMITTEE

Information Note: Asymmetric Risks

October 2011

Contents

1 SUMMARY

1.1 This Information Note was prepared by the Life Financial Reporting Sub-committee (LFRSC) on behalf of the Life Insurance & Wealth Management Practice Committee (LIWMPC) of the Institute of Actuaries of Australia (Institute). This Information Note does not represent a Professional Standard or a Practice Guideline of the Institute.

It has been prepared for the purposes of providing information and generating discussion on aspects of asymmetric risk that may lead to divergent practices (for financial reporting and other purposes) within the Institute's membership.

Feedback from Institute Members is encouraged and should be forwarded to the LFRSC.

This Information Note was issued in October 2011 and will be reviewed periodically. It replaces the Information Note issued in April 2008.

1.2 Asymmetric risks are complex, and the importance of understanding their nature is set out in Section 3, with examples of asymmetric risk given in Appendix 1.

Allowance for Asymmetric Risks is important for Members providing actuarial advice across a wide range of life insurance practice areas, in particular determination of policy liabilities, economic valuations, product pricing, bonus philosophy and setting investment policy. The existing guidance and legislation is set out in Section 4.

Section 5 discusses alternative valuation methodologies, and raises the question of consistency between the valuation placed on the assets and the various components of the liabilities. There is some debate about the extent to which consistency is possible, which is discussed in Appendix 2.

The interaction of best estimates, risk margins and allowances for volatility are covered in Section 6 including reference to global market consistent valuation developments. Some examples of possible inconsistencies are given in Appendix 3.

Section 7 covers current practices in respect of defining the asymmetric risk valuations for participating business, including interaction with vested benefits, requirement to use best estimate assumptions and suitable option pricing techniques. Appendix 4 includes further discussion on the asymmetric risk valuations for participating business, including policyholder retained profits, investment equalisation reserves, capital injections and bonus philosophy. Examples are given for when the liability adequacy test is passed and when it is

failed. The appendix includes discussion of the impact of profit volatility on future profit margins and on shareholder profits in the short and long term.

The last four sections cover capital calculations and tail distributions, management actions, policyholder behaviour and communicating the results respectively.

2 BACKGROUND

2.1 Asymmetric Risks

Asymmetric risks arise where cash flows or values have an asymmetrical statistical distribution. Common examples include a skewed distribution where the dispersion of outcomes is greater for negative results than for positive ones and an embedded option which generates a "kinked" payoff.

Where the outcome function is non-linear, the outcome from a deterministic projection of the mean assumption values may misstate the mean value of the outcome function. For example, an out-of-the-money option would often be valued at zero under this approach.

Understanding asymmetry is important when determining best estimate liabilities under APRA's Valuation Standard (LPS1.04) and other calculations which require mean outcome values.

2.2 Embedded Options

As noted above, the embedded options that exist in certain types of life insurance products are a particular example of a possible asymmetric outcome (although sometimes the terms are used interchangeably). Some embedded options are "auto exercise" (such as a guaranteed minimum crediting rate for a non-par investment account product) whilst others are exercised by specific policyholder actions (such as a conversion option with guaranteed terms).

The assessment of asymmetric risks arising from specific policyholder actions may be more complicated as the outcome function depends on whether policyholders exercise their options and whether they are exercised in an optimal manner.

3 NATURE OF ASYMMETRIC RISKS

3.1 Identifying and Understanding Asymmetric Risks

Asymmetric risks are common to many life insurance products and are a key consideration for Members when providing actuarial advice across a wide range

of areas (for example, determination of policy liabilities, economic valuations, product pricing, bonus philosophy/declaration, setting investment policy, evaluating reinsurance, prudential reserving and calculating economic capital). Not all of these areas are explicitly covered by the current Professional Standards, Practice Guideline and legislation discussed in Section 4.

To identify and develop an understanding of key asymmetric risks, the Member may need to consider:

- options and guarantees granted to policyholders, either explicitly in the policy document or implicitly through policyholder reasonable expectations;
- the operation of participating contracts and other forms of profit sharing and rebating;
- discretions available to the life insurer within policy design and legislative requirements. These might be constrained by policyholders' reasonable benefit expectations; and
- guaranteed crediting rates in non-participating investment account business and unit price guarantees in investment-linked business.

This Information Note is intended to help Members decide whether they have sufficient information and have undertaken adequate analysis to identify and understand all asymmetric risks that are material within the context of the calculation or assignment being undertaken.

More examples of asymmetric risks are provided in Appendix 1.

3.2 Asymmetric Assumptions

Many assumptions are slightly asymmetric because the value cannot go below zero but may increase by more than 100% of the expected. Further, short term symmetry may be converted into long term asymmetry by compounding. Mortality, expenses and lapses fall into these categories. The asymmetry of the assumptions may be material, particularly in the tail of the probability distribution used in determining capital requirements.

To the extent that these risks are not seen to correlate strongly with investment markets, this asymmetry may have limited direct impacts on the economic valuation of cash flows associated with these risks, provided the mean outcome is used rather than the median.

4 EXISTING GUIDANCE & LEGISLATION

4.1 References to Asymmetric Risks

In certain instances – such as policy liability calculations, economic valuations and regulatory prudential capital requirements – the requirement and/or the method for allowing for asymmetric risks is covered in Actuarial Standards, Accounting Standards, Professional Standards or Practice Guidelines. A high level summary of these references is set out in the sub-sections below.

The following terminology (in respect of the prudential standard issued by APRA in November 2007) is used in the remainder of this Information Note:

- Valuation Standard ("LPS1.04")
- Solvency Standard ("LPS2.04")
- Capital Adequacy Standard ("LPS3.04")
- Management Capital Standard ("LPS6.03")

Similarly, the term "AASB1038" is used to refer to the Life Insurance Contracts accounting standard issued by the AASB in April 2007.

The contents of this Information Note may need to be revised if future successor standards contain different requirements for asymmetric risks compared to the standards listed above.

4.2 LPS1.04 (Valuation of Policy Liabilities)

This standard sets out the basis for calculating policy liabilities in respect of life insurance contracts, consistent with the objectives of realistic profit reporting, and provides for the release of profit over the life of the business. The overall policy liability comprises of two components: a Best Estimate Liability and a Profit Margin.

Under LPS1.04, the Best Estimate Liability should be representative of the mean of the distribution of the potential liability outcomes. Members should undertake analysis to identify and understand instances where the input assumptions or outcome function for the Best Estimate Liability is asymmetric.

LPS1.04 notes that allowances for asymmetry may be incorporated through adjustments to the assumptions or separate adjustments to the Best Estimate Liability.

Where embedded options exist, these must also be allowed for in the calculation of the Best Estimate Liability. LPS1.04 states:

> "Where the benefits contain options that may be exercised against the company, then either the value of those options must be determined (via a suitable option pricing model) and added to the Best Estimate Liability, or the Best Estimate Assumptions adjusted so as to appropriately capture the value of the options as part of the Best Estimate Liability." (paragraph 5.3.4)

4.3 AASB1038 (Accounting for Life Insurance Contracts)

This standard sets out the requirements for measuring life insurance contract liabilities for the general purpose accounts, and makes no explicit requirements regarding asymmetric risks. However, it does include a requirement to value embedded derivatives at fair value under some circumstances. It would also appear to be standard industry practice to make the same allowances for asymmetric risks when determining liabilities under AASB1038 and LPS1.04.

4.4 LPS2.04 (Solvency), LPS3.04 (Capital Adequacy) and LPS6.03 (Management Capital)

LPS2.04 and LPS3.04 set out prudential regulatory capital requirements for statutory funds, and LPS6.03 for the shareholders' fund.

Under these standards, the impact of many common asymmetric risks is measured using simple prescribed stresses.

Nonetheless, an overarching principle applied in all of these standards is that the Member perform further analysis and calculate additional capital requirements for material risks that are considered to be not fully captured or measured by the methodology described in the standards.

For these risks, the Member should broadly target a level of sufficiency consistent with that for the risks explicitly considered in the standards.

Where best estimate reporting under LPS1.04 uses a simple approximation for an asymmetric outcome distribution (often a deterministic base projection with an allowance for asymmetric risk), a similar approximation that takes into account the circumstances considered in the prudential standards might be used. For calculations of the value of asymmetric risks within resilience reserves in LPS2.04 and LPS3.04, it may be reasonable to consider the market shocks as a scenario, and recalculate the value of the asymmetric risk as that which would be reported under LPS1.04 if that scenario came to pass.

The need to calculate capital requirements for risks not explicitly considered in the standards may be particularly relevant for certain asymmetric risks and embedded options including where the company is exposed to unusual risks. The standards set out margins (or a range of margins) for the exercise of options.

4.5 LPS5.02 (The Cost of Investment Performance Guarantees)

This standard is concerned with the asymmetric outcome from providing performance guarantees on unit linked business. It sets out a prescribed approach for measuring the cost of an embedded option for the purposes of determining whether it exceeds the limit for investment linked business as set out under section 42 of the Life Insurance Act 1995 (Cth) (Life Act).

Although the approach is prescribed, it refers to the principles and calculations under LPS3.04 which, as noted in Section 4.3 above, require the Member to include a further margin for risks that are considered to be not fully captured or measured by the methodology prescribed in the standards.

4.6 PS 200 (Actuarial Advice to a Life Insurance Company or Friendly Society)

PS 200 applies to advice to a life insurance company or friendly society relating to premium rates and charges, financial condition investigations and the distribution of surplus. In particular, when analysing the financial condition of the company, the Appointed Actuary is required to comment on the relationship between the nature and term of the assets and the corresponding liabilities, including any guarantees and options available under the policies and the likely effect of the exercise of those options.

The liability valuation method should take into account any guaranteed benefits and options, and the Appointed Actuary should make appropriate provisions for reserves to meet specific adverse contingencies not already allowed for in the calculation of the valuation liabilities.

4.7 Practice Guideline 199.03 (Economic Valuations) (PG199.03)

This PG sets out the considerations that bear on the work involved in carrying out economic valuations. It describes general principles and procedures for carrying out and reporting on economic valuations. This includes economic valuations used to support a market valuation or a fair valuation.

The PG expects that Members should make appropriate allowance for any material optionality or non-linear outcomes in the cash flows being modelled.

4.8 IFRS4 (Insurance contracts), IAS39 (Financial Instruments: Recognition and Measurement), IAS32 (Financial Instruments: Disclosure and Presentation) all deal with options and guarantees.

IAS39 generally requires derivatives on investment contracts to be separated from the host contract and valued as a derivative. This is not required if the host contract itself is a life insurance contract.

It would be normal to consider and quantify asymmetric risks for the purpose of the liability adequacy tests under the new IFRS standards.

4.9 Guidance is continually evolving.

The International Accounting Standards Board (IASB), the International Actuarial Association (IAA), various regulators and other bodies are continuously issuing discussion papers and new standards that have a bearing on these matters. Members cannot be expected to keep abreast of all the debates outside of Australia. It can be noted that the IASB issued an Exposure Draft on Insurance Contracts on 30 July 2010, with comments due by 30 November 2010. The ED proposes a "building block" approach with the first building block defined as "a current, unbiased and probability weighted estimate of the cash flows from the insurance contract".

5 VALUATION METHODOLOGIES

5.1 The Member should be satisfied that any method used is appropriate for the particular circumstance. The degree of detail and precision in an asymmetric risk calculation should be appropriate to the context in which it is being performed.

The model used will depend on the size and materiality of the asymmetric risk, the quality of the data available, the intended use of the analysis and the needs expressed by the key stakeholders.

Common valuation models which the Member is likely to consider using include:

- stochastic:
  - risk neutral models
  - real world models;
- scenario and stress testing;
- replicating portfolios; and

- combinations of the above.

In applying these methods, the Member should be satisfied that the method is appropriate. Key aspects of these models are discussed in the following subsections.

5.2 Internal consistency

Whatever method is used, the Member should ensure as far as possible that there is consistency between the valuation placed on the assets and the various components of the liability. There is some debate about the extent to which this is possible, which is discussed in Appendix 2.

Consistency between the basis of the calculation of an asymmetric risk reserve and the application of the resulting asymmetric risk reserve under LPS1.04 needs to be ensured, in particular in the treatment of policyholder retained profits for participating business and investment equalisation reserves for investment account business. Different approaches to achieve this are discussed in Section 7 below.

5.3 Stochastic Models

This method normally involves multiple simulations of the asset or liability outcomes using distributions for key assumptions regarding future experience.

The risks that life insurance companies are exposed to are complex and there may be many processes and outcomes that are correlated, while other processes may have limited correlation and may provide diversification benefits. These relationships can be incorporated in a stochastic model enabling the risks to be statistically analysed. The complexity and interaction of events in many cases necessitates a full analysis across the full distribution of outcomes as opposed to analysis of a single tail event.

It is desirable that the underlying distributions assumed are reasonable, that a statistically sufficient number of simulations are used to produce stable results or convergence, particularly when uncertainty in the 'tail' of a distribution is being considered and that appropriate allowance for the impact of correlations in the tails of distributions are made.

Stochastic models for assessing asymmetric risks for participating business are invariably complex if they are to calculate representative outcomes allowing for the interaction of investment performance, bonus philosophy and underlying guarantees to policyholders. Modelling considerations include allowance for:

- investment assumptions – asset class returns and correlations of returns between asset classes. Volatility assumptions, both current and extending over the duration of the model, can be 75 plus years, to points where there is little or no market activity;

- bonus philosophy – changes in reversionary and terminal bonus rates in response to modelled impacts of investment and other assumptions;

- threshold for shareholder injections – allowing for small deficits that are subsequently recovered relatively quickly; and

- other assumptions – allowance for impact of interaction of assumptions above on other assumptions such as lapses and expenses.

5.3.1 Risk neutral methods

With risk neutral methods, the discount rate used is a risk free rate and a "risk neutral" and notional probability distribution of (asset) return outcomes is established from the market price of relevant derivatives. Risk neutral methods are particularly applicable where investment or market-related gearing exists. They may also be more appropriate to determine the impact of asymmetric risks on the best estimate liability, when it is discounted at the risk free rate. Some practitioners would extend risk neutral methods to liabilities based on best estimate earning rates, such as participating business under AASB1038.

These methods will not produce cash flow projections on a realistic basis. This means that projected cash flows will generally not be suitable for other purposes, such as business planning. It also means that the communication of the projection results to users and the validation of the risk neutral cash flows may be challenging, as they will not necessarily reconcile to real world cash flows.

In applying these methods, the Member should be satisfied that the degree to which each cash flow is market-related can be reasonably ascertained or approximated and that the risk neutral probabilities are appropriate.

Risk neutral probabilities are not available for non-investment risks that are not traded. There are some theoretical grounds for adjusting real world lapse and expense rates for pricing and valuation purposes, but these are often not applied on either materiality grounds or because of a lack of a reasonable basis for an adjustment.

Risk neutral approaches tend to have less application in assessing capital requirements.

5.3.2 Real world methods

"Real world" projections use distributions of values or cash flows based on expected future actual experience (that is, realistic projections). They are appropriate for determining solvency and capital adequacy requirements, but are more difficult to use in the determination of market consistent option costs.

If a real world approach is adopted, significant adaptation is required (via the use of state price deflators which adjust for the fact that market participants place different "utility" on different outcomes) when used in the determination of market consistent present values.

5.3.3 Models should be market consistent and arbitrage free

Members would normally take care that their models are consistent with market prices. This not only means that assets should be valued at market prices, but that the liability assumptions as to discount rates and statistical distributions should be consistent with the market price of available derivatives (options, swaps, future contracts, etc).

Members may have to use their judgment in this area as the prices of derivative instruments are not always consistent with each other or with historical volatilities. It is often inappropriate to extrapolate knowledge about short term probability densities near the mean to estimate longer term probability densities in the tail of the distribution.

The models should also not effectively assume that unrealistic arbitrage profits will arise in future. It is, for example, inappropriate to discount cash flows that assume an equity risk premium using a discount rate based on a lower amount of market risk or value far out-of-the-money options using volatilities unadjusted for the tail of the volatility surface.

5.4 Scenario and Stress Testing

A projection of a number of especially extreme scenarios can often add insight, aid communication and may provide essential information to management of the impacts that can be expected if the tail of a distribution occurred.

Historical events and market conditions are another source of possible stress test scenarios.

5.5 Replicating Portfolio

It is sometimes possible to construct a portfolio of simple financial instruments that replicates a more complex instrument. These simple instruments may include

physical holdings of the underlying asset as well as derivatives including options. The price of these options can then be obtained from the market. This represents a non-stochastic solution in some cases, but can only be used where relevant market prices exist for the components of the complex instrument.

5.6 Combination of Above

A combination of approaches may sometimes be appropriate, particularly to help illustrate the impact of an alternative model.

6 BEST ESTIMATE VALUATIONS

6.1 Under a best estimate valuation, the focus will be on understanding the mean valuation result. While the whole probability and outcome distribution should be considered, the main focus may often be on the more probable outcomes when determining a best estimate valuation, whether it is for profit reporting, economic valuations, pricing or other purposes requiring a best estimate view.

6.2 Traditionally, embedded value measures have been calculated on a best estimate basis. Historically, asymmetric risks were typically not explicitly allowed for in these valuations but were, in theory, reflected in the risk discount rate. With the growing prominence of fair value principles (including in embedded value reporting, for example the market-consistent embedded value principles adopted by the CFO Forum[1] in Europe), asymmetric risks are often allowed for in both market consistent and traditional basis.

6.3 LPS1.04 mostly prescribes the policy liabilities to be valued on best estimate assumptions. This could be interpreted to extend to valuing the asymmetric risks but the standard is not explicit in this. Only section 11 of the standard specifically prescribes an approach based on the use of risk free rates for the purpose of calculating the "Adequacy Threshold" (that is, for the application of the liability adequacy test).

6.4 As noted earlier, Section 5.3 of LPS1.04 outlines the main considerations in incorporating an allowance for asymmetric risks within the Best Estimate Liability. In particular, Section 9.1 of LPS1.04 includes considerations for recalculating profit margins. For profitable non-participating business, an increase in the best estimate liability due to assumptions other than investment fluctuations results in

[1] The European Insurance CFO Forum ('CFO Forum') is a high-level discussion group formed and attended by the Chief Financial Officers of major European listed, and some non-listed, insurance companies. Its aim is to influence the development of financial reporting, value based reporting and related regulatory developments for insurance enterprises on behalf of its members, who represent a significant part of the European insurance industry. The CFO Forum was created in 2002.

an offsetting decrease in the value of future profit margins. Hence as long as the product is not in capitalised loss, an increase in the best estimate liability due to non-economic assumptions within the allowance for asymmetric risk may not directly affect the policy liability or emerging profit.

6.5 For similar reasons, the allowance for asymmetric risk may or may not have an impact on the policy liability for participating business, depending on the backing assets assumed in measuring the allowance for asymmetric risk, except via the deduction of current period profits. The appropriate adjustments to the components of the balance sheet are likely to be dependent on the particular method used to value the asymmetric risks in participating business. Further details on allowance for asymmetric risks within participating policy liabilities are set out in Appendix 4.

6.6 For all business, the method used to value the asymmetric risk will therefore be considered in the context of the size of the product's overall best estimate liability and profit margins, along with its potential impact on the timing of profit emergence.

6.7 It is also important that any adjustment to the best estimate liability in respect of asymmetric risks is determined consistently with the best estimate liability calculation. For example, the best estimate liability may include the intrinsic value of the risk and hence only a time value adjustment is required. Examples of possible inconsistencies that may arise can be found in Appendix 3.

6.8 Section 3.9 of LPS1.04 states that, with regard to benefits that include any embedded options, "the Best Estimate Liability must include an appropriate value in respect of those options". Section 5.3.4 of LPS1.04 states that "either the value of those options must be determined (via a suitable option pricing method) and added to the Best Estimate Liability, or the Best Estimate Assumptions adjusted so as to appropriately capture the value of the options as part of the Best Estimate Liability." The reference to "a suitable option pricing method" is interpreted by some practitioners to mean that a risk neutral approach needs to be adopted for the calculation of asymmetric risk, even under the best estimate framework of LPS1.04. Other interpretations are possible as discussed in Appendix 2.

7 PARTICIPATING BUSINESS

7.1 The best estimate liability (BEL) for participating business will use similar considerations as for non-participating business, because the BEL is defined under LPS1.04 as only applying to the existing guaranteed benefits. A simple investment mismatch for the assets backing the BEL is no more an asymmetric risk than an equivalent example for a non-participating product with guaranteed benefits.

7.2 For participating business, the asymmetric risk does not arise from vested benefits valued in the BEL. Some practitioners interpret section 3.9 of LPS1.04 to mean the asymmetric risk should only be allowed for to the extent that it arises from vested benefits being valued in the BEL, and hence conclude that no asymmetric risk reserve is required for participating business. However, the standard is more commonly interpreted to mean that there is an asymmetric risk for typical participating business in that the life insurance company may not be able to declare future bonuses to policyholders at rates which meet policyholders' reasonable expectations (PRE), and that this risk should be reflected in the BEL. Further comments in this regard are provided in Appendix 4.

8 CAPITAL CALCULATIONS & TAIL DISTRIBUTIONS

8.1 Appropriate consideration of extreme events, at the tail of the probability distribution, is particularly important in capital adequacy reporting, as the focus of the analysis is on the likelihood and impact under adverse circumstances.

8.2 In some cases, a simple stress test may provide a simple substitute for a more technical stochastic approach. This is particularly the case when investigating the impact of events in the tail of the probability function as the parameters for the stress test can be based on observed events (although Members would also be aware that extreme events may be over- or under-represented in recent available data).

8.3 A stochastic approach requires a subjective estimate of future experience that may not be apparent to the users.

8.4 The value and capital requirements relating to asymmetric risks may be particularly affected by the distribution of variables in the tails, and correlations between parameters. In particular, correlations in the tails of distributions may be different to overall average correlations.

8.5 It is important to note that the resilience reserve component of the regulatory capital requirement is generally not a suitable replacement for an asymmetric risk reserve under LPS1.04. The resilience reserve calculation represents a single point in the tail of the distribution, whereas the asymmetric risk reserve represents a weighted valuation across the distribution of possible outcomes (which is more consistent with a pricing methodology of an embedded option). In addition to this, the asymmetric risk reserve is required to form part of the accounting liability.

9 MANAGEMENT ACTIONS, DISCRETIONS & MITIGATION STRATEGIES

9.1 The impact of asymmetric risks may be significantly affected by the exercise of management actions and discretions. Examples include:

- changes to declared bonus and crediting rates for both participating and discretionary non-participating business;
- changes to surrender values;
- discretions to alter fees and to change other policy terms and conditions;
- alterations to premium rate scales;
- changes to asset allocation strategies or implementation of hedging strategies; and
- other mitigation strategies such as expense management, reinsurance and the ability to terminate or refuse to renew contracts.

There are various factors to consider when assessing discretions, including how and when they can be exercised. Past actions or communications may create implied or constructive obligations that may constrain management actions. There may be limited flexibility to change bonus and crediting rate philosophies.

In addition, there may be delays before changes are approved and implemented and they may require policyholder notification. Members should also consider the impact of the exercise of management actions on policyholder actions, especially lapse and take-up rates.

Companies will also be aware of the ability of reinsurers or other companies (including other companies within the same overall group as the life company) to exercise discretions against them, and the impact of this on their mitigation strategies – for example their reinsurers' ability to terminate cover or refuse to renew. In addition, there may be limited ability to implement other asset based mitigation strategies (for example, reflecting market illiquidity or volatility adversely impacting market cost of options), which may also need to be considered.

Factors that can provide comfort that proposed management actions will be followed in various scenarios include: any precedents created through previous company actions and industry practices; systems, processes and documentation being in place to monitor key drivers, risk indicators and risk limits and react to changes in circumstances; and any pre-existing approval by the board to act in a certain way under certain conditions.

Rules for management actions and discretions can be included in scenarios or dynamic stochastic models, to enable a more realistic impact to be considered of a range of outcomes.

10 POLICYHOLDER BEHAVIOUR

10.1 Additional variability in potential outcomes arises from the uncertainty of policyholders' responses.

10.2 Developing a probability distribution of policyholder behaviours may be appropriate with the mean outcome being used for best estimate reporting and the tail being used for capital reporting. Different correlations between policyholder behaviour and the other risks may however affect both the mean value and the required capital.

Any dynamic policyholder behaviours that serve to benefit the shareholder should be very carefully considered to ensure this is a reasonable outcome in the circumstances.

10.3 Presenting a range of possible outcomes may also be appropriate to indicate the impact of different policyholder behaviours.

11 COMMUNICATING ASYMMETRIC RISKS

11.1 The communication of asymmetric risks should be driven by the purpose of the exercise. In financial reporting, Accounting Standard AASB 7 Financial Instruments: Disclosures has certain requirements for sensitivities to be disclosed.

11.2 In other circumstances, such as pricing or risk management, it may not be sufficient to put a single value on an asymmetric risk, particularly where the risk being quantified is subject to significant uncertainty. It may be more appropriate to support any best estimate number produced with a number of scenarios to give an idea of the variability and importance of the risk being considered.

11.3 In a life insurance environment, it would be expected that material asymmetric risks would be discussed in the Financial Condition Report.

11.4 Consideration should be given to the audience that will be receiving the communication:

- Will they want detailed technical information or general information?
- Will they have an understanding of the full range of possible outcomes?
- Will they have an undue focus on recent good or bad experience when options and guarantees in contracts may apply for a considerable period?
- Are they aware of similar risks in different countries or industries, or at different time periods?

- Do they understand the uncertainties in any quantification, such as in the assumptions or simplified modelling?

- Do they know that the general starting point is that it is often possible to reduce, eliminate or transfer a risk through reinsurance or asset matching? If any other approach is proposed, are they aware of why the matching approach was accepted or rejected?

11.5 Depending on the use of the report, it may be appropriate to describe risk mitigation strategies. Asymmetric risks can be reduced, transformed or transferred in a large number of ways, including through policy design before the risk is written, or through changing investment strategy and reinsurance afterwards.

11.6 The communication of risks that are quantified using stochastic techniques in particular needs care to balance the amount of information available and the amount of information being presented such that it is appropriate for the intended audience.

11.7 Spurious accuracy should be avoided when communicating results, and an appreciation of uncertainties and subjective elements of the calculations should be provided, whether numerically by sensitivity analysis or scenario testing, or qualitatively by description, or in some other manner.

APPENDIX 1 – EXAMPLES OF ASYMMETRIC RISKS

(a) Conventional Participating business and Investment Account business. All the upside is generally split using a certain profit participation percentage, while the downside may require the company to meet the underlying guarantees and take 100% of the loss after a certain point.

(b) Extra cost guarantees on investment linked products may also require the company to meet 100% of the loss after a certain point.

(c) Guaranteed annuity conversion options, where the annuity rate is guaranteed, can create a large difference between market rates and guaranteed rates, leading to significant financial selection effects.

(d) Caps on fees and other inflation risks may provide losses in times of high inflation.

(e) Policyholder free look period can be a short option to the policyholder, for example investment products involving a guarantee.

(f) Profit sharing formulae (reinsurance and group risk) may give away most of the upside but little of the downside. This occurs in par business as noted in (a) and non-par business with a specified profit sharing formula, particularly where losses are not carried forward.

(g) Tax is asymmetric as the company will always need to pay tax on profits but may not be able to claim tax losses in all adverse scenarios.

(h) Non-proportional forms of reinsurance, such as stop loss and catastrophe insurance, are asymmetric.

APPENDIX 2 – POTENTIAL INCONSISTENCIES WHEN VALUING LIABILITIES WITH ASYMMETRIC RISKS

LPS1.04 and AASB1038 were produced to reflect the limited changes under the Phase 1 IFRS Standard for insurance contracts. As such, both standards grandfathered many of the provisions of their predecessors.

Both standards require the use of discount rates that reflect the market risk inherent in the policyholder benefits. Hence liabilities in respect of products whose benefits are contractually linked to assets values (for example, participating products) are normally valued using best estimate earning rates (ignoring liability adequacy testing) and liabilities in respect of other products (for example, pure risk products) are valued using risk free discount rates.

As noted earlier, AASB1038 contains few provisions regarding asymmetric risks and this Information Note has proposed using the same methods for life insurance contracts with asymmetric risks under both AASB1038 and LPS1.04.

LPS1.04 states that the best estimate liability must include the value of any options that may be exercised against the company and that this value should be determined using a suitable option price method.

There is likely to be an inconsistency between option values determined using a risk neutral valuation and a best estimate liability that is based on real world distribution assumptions and discounted at either risk free discount rates or best estimate earning rates, if the best estimate is the mode of the distribution. It is however possible to use real world probabilities and discount at a risk adjusted rate to produce market consistent present values. Given that the real world probabilities are based on the market returns of the underlying assets, it can be argued that the standards permit the use of fair value.

Because LPS1.04 (and its predecessors) have not required the calculation of market consistent liabilities, two solutions suggest themselves:

- One possible solution would be to value the entire life insurance liability using market consistent techniques. (This method may include separating the life insurance liability into components dependent on the performance of the assets supporting the liability, as well as a guaranteed component). This approach would seemingly be consistent with the fair value measurement approach required for financial instruments (including life investment contracts).

- An alternative solution would be to value the options using real world probabilities and an appropriate risk adjusted rate for discounting. It may however be difficult

to find an appropriate distribution of real world outcomes and appropriate discount rates that reflect the nature, structure and term of the liabilities.

This alternative applies if the liabilities are not linked to investment performance. If they are related to investment returns, then the discount rate should be the same for both assets and liabilities. In such cases, the options can either be valued using risk neutral rates or real world deflator methods.

A further alternative is to value the asymmetric risk reserve only using market consistent option techniques, although this creates a potential inconsistency when combined with a liability determined on a real world basis.

LFRSC is not aware of this inconsistency being a material issue for any practitioners. It notes that either approach appears to be theoretically justifiable. As the increase in BEL (due to the inclusion of the value of options) will normally be offset against profit margins, this is only likely to be an issue when products are in, or close to, loss recognition. Examples of how the inclusion of the value of options can impact the policy liability are provided in Appendices 5 and 6.

LFRSC notes that capital reserving requirements under LPS2.04, LPS3.04 or LPS6.03 are based on adverse real world scenarios. As discussed in Section 5.3.2, real world methods are required for determining the appropriate capital reserves in respect of asymmetric risks and so the inconsistency described above does not seem to arise in this case.

APPENDIX 3 – EXAMPLES OF POSSIBLE INCONSISTENCIES BETWEEN ASYMMETRIC RISK VALUATIONS AND DETERMINISTIC BEST ESTIMATE LIABILITY VALUATIONS

It should be noted that this is a simple artificial example to demonstrate the principles and possible pitfalls.

Consider a profit share arrangement on a pure risk policy. The example ignores discounting and assumes a 1 year time period only. The profit share terms are
Max {0, 60% * [75% Premiums – Claims]}.

The profit share represents an asymmetry as the policyholder shares in the upside only.

Example 1 – "Out-of-the-Money" Scenario

Assume claims have three possible scenarios:

Claim Scenario	Payment at t=1	Probability
A	1,000	40%
B	2,000	40%
C	3,000	20%
		100%

The premium charged is 2,000. The financial outcomes are shown in the table below.

Table 1 – Asymmetry Cost Based on Upside Paid Away

Claim Scenario	Premium at 0	Claims at 1	Profit Share at 1	BEL at 0	Probability
A	2,000	1,000	300	-700	40%
B	2,000	2,000	0	0	40%
C	2,000	3,000	0	1,000	20%
Mean outcome	2,000	1,800	120	-80	
Outcome using mean inputs	2,000	1,800	0	-200	

The cost of the profit share is estimated using two different methods in Table 1:

- As the mean of the cost estimated in each scenario (120).

- As the cost using the deterministic mean input assumption
  that is, 60%* (75% * 2,000 – 1,800) = 0, which clearly understates the true expected cost.

The correct BEL at time 0 is -80 (calculated as the mean of the scenario outcomes for the BEL). The same result can be obtained by adding the cost of the profit share from the scenario analysis (120) to the BEL calculated ignoring the profit share (-200).

The "intrinsic value" of the asymmetry (defined as the value using mean inputs) can be considered to be zero and the "time value" of the asymmetry (the balancing item) can be taken to be 120.

The discussion so far has examined the value of the profit share by reference to the amount of upside profit given away to the policyholder in each scenario. An alternative approach is to consider the cost of the profit share as the amount of downside that is not able to be passed onto the policyholder in each scenario. The two approaches should provide the same answer (using the same logic as underlies put-call parity in option pricing). However, care needs to be taken to ensure this outcome arises as shown below.

Table 2 – Asymmetry Cost Based on Downside NOT Shared

Claim Scenario	Premium at 0	Claims at 1	Losses unable to be shared at 1	Probability
A	2,000	1,000	0	40%
B	2,000	2,000	300	40%
C	2,000	3,000	900	20%
Mean outcome	2,000	1,800	300	

Note: the "losses unable to be shared at 1" represent the losses under the profit share formula that the insurer would pass onto the policyholder if the profit share formula was not subject to a minimum payment of zero.

The cost of the profit share (300) is seemingly overstated in Table 2 compared to Table 1. However, the cost under this approach represents the time value only and ignores the intrinsic value. The intrinsic value is -180 (= 60% * [75% * 2,000 – 1,800]). Hence the correct adjustment to the deterministic BEL (120) is only obtained once both components are taken into account.

Example 2 – "In-the-Money" Scenario

An example is now considered where the intrinsic value of the option is positive at time 0 (that is, a profit share is expected to be paid under deterministic best estimate inputs).

The assumed claims distribution is revised to be:

Claim Scenario	Payment at t=1	Probability
A	1,000	45%
B	2,000	35%
C	3,000	20%
		100%

The premium charged is now assumed to be 2,500 and the revised outcomes are below.

Table 3 - Asymmetry Cost Based on Upside Paid Away

Claim Scenario	Premium at 0	Claims at 1	Profit Share at 1	BEL at 0	Probability
A	2,500	1,000	525	-975	45%
B	2,500	2,000	0	-500	35%
C	2,500	3,000	0	500	20%
Mean outcome	2,500	1,750	236	-514	
Outcome using mean inputs	2,500	1,750	75	-675	

The correct BEL at time 0 is now -514. However, it is noted that an incorrect result (of -439) can be obtained if the mean profit share cost (236) from the scenario analysis is added to the deterministic BEL of -675.

That is, the scenario analysis does not provide the correct adjustment to apply to the BEL using deterministic mean inputs. This is because the intrinsic value (75) is double counted (it is in both the deterministic cost and the scenario based cost). (The correct adjustment is 236 – 75 = 161).

The revised outcomes when the cost of the profit share is viewed as the amount of downside not able to be passed on are shown below.

Table 4 – Asymmetry Cost Based on Downside NOT Shared

Claim Scenario	Premium at 0	Claims at 1	Losses unable to be shared at 1	Probability
A	2,500	1,000	0	45%
B	2,500	2,000	75	35%
C	2,500	3,000	675	20%
Mean outcome	2,500	1,750	161	

The cost using this approach (161) is now the correct adjustment to apply to the BEL, ignoring any asymmetry in the profit share calculation - although the asymmetry does not apply when using deterministic mean inputs - to give the correct overall BEL.

Discussion

The above two examples are intended to illustrate some of the basic principles when allowing for asymmetric risks in liability valuations. In particular, the liability adjustment to allow for an asymmetric risk needs to be consistent with any existing allowances for this risk.

APPENDIX 4 – ADDITIONAL CONSIDERATIONS FOR PARTICIPATING BUSINESS

A4.1 GENERAL CONSIDERATIONS

(a) The key asymmetric risks for typical participating business are:

(i) future bonuses/crediting rate must be declared to policyholders at rates which meet policyholders' reasonable expectations (PRE). In some cases, this implies that future bonuses/crediting rates cannot be negative, whereas in other cases, this might imply future bonuses/crediting rates cannot be less than a specified positive rate; and

(ii) available assets are insufficient to meet statutory minimum liabilities (for example, the Liability Adequacy Threshold test), which may require a "top-up" by the shareholder of the available assets that cannot be recovered by the shareholder in the future, even if this top-up is no longer required to meet the statutory minimum.

(b) Alternatively, these risks can be considered as an option for policyholders to receive benefits in excess of the total assets backing this business (that is, those which are "earmarked" for policyholder benefits) in certain circumstances, requiring the shareholder to meet the shortfall.

(c) Industry practice may be divergent for reporting under LPS1.04 for participating business, regarding the option described above in (b). It is understood that most companies currently allow for the value of this asymmetric risk within the BEL.

(d) LPS1.04 is also unclear as to what amount of assets can be considered to be earmarked for participating policyholder benefits when assessing this risk and this could lead to divergent practices. In particular, it is unclear as to the extent to which policyholder's retained profits (PRP) can be assumed to back the participating business when assessing this asymmetric risk.

(e) In practice, PRP is available to fund future participating policyholder benefit payments and so it would generally be reasonable to allow for this amount when assessing this asymmetric risk under LPS1.04. (This is not inconsistent with AASB1038's treatment of these amounts as an unvested policyholder benefits liability.)

(f) The inclusion of PRP effectively means that future shortfalls (which would be borne by the shareholder) will only arise if the BEL, policyholder profit margins and PRP are insufficient to meet PRE and this would normally be allowed for in determining liabilities under LPS1.04.

(g) The extent to which PRP and future policyholder profits have been allowed for in the calculation of the asymmetric risk reserve may need to be considered when applying the outcome of the asymmetric risk reserve calculation to LPS1.04. In particular, if the PRP, shareholder future profits or policyholder future profits are included to meet PRE in the assessment of the asymmetric risk, and an increase in the BEL is required, that is, the cost of the asymmetric risk is not zero, then offsetting the increase in the BEL against the PRP, shareholder future profits or policyholder future profits respectively would mean that the support of these would be (inappropriately) "double counted" in determining the impact of the asymmetric risk on the policy liability and on profit. This is discussed further in examples below.

(h) Assessment of these risks needs to have regard for discretions (as set out in Section 8), as well as equity considerations (as discussed in PS 200). Under a stochastic model, the discretions used may differ depending on the economic scenario, thus the discretions may be dynamically modelled per scenario.

In summary, LPS1.04 is widely considered to be open to multiple interpretations with no single "correct" interpretation being clear. In practice, interpretations vary considerably across companies and practitioners. There are a number of approaches that could reasonably be interpreted to be allowable under LPS1.04 and AASB1038 and different approaches are in use, although all approaches should consider the constraints imposed by the Life Act. Separate examples are shown in Appendix A4.2 below for the scenario where the liability adequacy test is passed.

Appendix A4.3 deals with the scenario where the liability adequacy test is failed.

A4.2 EXAMPLES OF THE APPLICATION OF ASYMMETRIC RISK VALUATIONS UNDER LPS1.04 AND AASB1038 – LIABILITY ADEQUACY TEST PASSED

The following three approaches will be described in this section:

- increasing the policy liability and recognising a shareholder loss with increases in the asymmetric risk reserve;
- increase the BEL with increases in the asymmetric risk reserve, but offset by a decrease in the present value of future profit margins; and
- no explicit asymmetric risk reserve.

Example 1 – Increase the Policy Liability

This is the more conservative interpretation of the standards, as the value of the implicit guarantees are added to the value of the liability and are therefore immediately

recognised as a shareholder loss. Taking into account the considerations discussed in paragraph (g) of Appendix A4.1, this example assumes that the PRP are exhausted in the modelling underlying the calculation of the asymmetric risk reserve and may therefore not be available to support funding the asymmetric risk reserve.

Increase the Policy Liability – What Do the Standards Say?

Under this approach, any changes in the asymmetric risk reserve are treated as being due to investment market assumptions related to investment market movements as described in section 8.5(c) of AASB1038 and recognised in the profit for that period.

> "The financial effects of changes to the assumptions underlying the measurement of life insurance liabilities made during the reporting period shall be recognised in the statement of comprehensive income over the future reporting periods during which services are provided to policyholders, except that: …
>
> (c) the effects of a change to adopted discount rates and related economic assumptions caused by changes in investment market and general economic conditions shall be recognised as income or expense of the reporting period in which the change occurs;"

The policy liability of participating business is generally valued as the value of supporting assets (VSA) as described in section 10.2 of LPS1.04.

> "10.2 Value of Supporting Assets
>
> 10.2.1 The Value of Supporting Assets is determined as:
>
> a) the Policy Liability at the end of the previous reporting period; plus
>
> b) the cost of declared Bonuses at the end of the previous period; plus
>
> c) the actual policy related cash flows and investment experience as reported in the regulatory financial statements; less
>
> d) the expected Shareholder Profits emerging over the period and the non-investment Experience Profit.
>
> 10.2.2 The Value of Supporting Assets must be calculated so as to attribute no value of assets to terminated benefits."

An increase in the policy liability due to an increase in the asymmetric risk reserve leads to an increase in the liability beyond the VSA. Under this interpretation, this leads to

recognition of an expense (loss) in the relevant period according to section 9.2.5 of AASB1038:

> "Where a life insurer "tops up" the vested benefits from previously recognised unvested policyholder benefits liabilities, a transfer between liabilities is recognised. If a life insurer tops up the vested benefits for participating policyholders other than from unvested policyholder benefits liabilities, the amount of the "top up" is recognised as an expense of the reporting period in which the additional benefits are vested."

Increase the Policy Liability - Complications

The biggest complication of this approach is that, from a shareholder point of view, the loss is irreversible. Once the liability has been increased and the cost of the increase in the liability has been allocated 100% to shareholders, under section 60 of the Life Act, a subsequent decrease in the policy liability due to a reduction in the asymmetric risk reserve cannot be allocated 100% to shareholders and must be split (generally) 80/20 between policyholders and shareholders.

> "60 Basis of allocation of operating profit etc.
>
> (1) The allocation of an operating profit of a category of business of a statutory fund must be made in accordance with the following rules:
>
> (a) in the case of a profit of a category representing Australian participating business, at least 80%, or such higher percentage as is specified in the constitution of the company, of the profit must be treated as, or added to, Australian policy owners' retained profits of the statutory fund;
>
> (b) any part of a profit of a category representing Australian participating business and not allocated under paragraph (a) must be treated as, or added to, shareholders' retained profits (Australian participating) of the statutory fund;
>
> (2) The allocation of an operating loss of a category of business of a statutory fund must be made in accordance with the following rules:
>
> (a) in the case of a loss of a category representing Australian participating business, no more than 80%, or such higher percentage as is specified in the constitution of the company, may be taken into account in reduction of Australian policy owners' retained profits of the statutory fund;
>
> (b) any part of a loss of a category representing Australian participating business and not allocated under paragraph (a) must be allocated in

reduction of shareholders' retained profits (Australian participating) of the statutory fund;"

Under LPS1.04, the definition for the determination of the VSA and hence of the policy liability could be interpreted as not allowing for an increase or a decrease to the liability to be made, other than by the prescribed definition. However, should a company decide to increase the assets supporting the liability, the principle based nature of the standard could be used to support an alternative approach.

It may be argued that the loss can be allocated 80% to PRP and 20% to SRP. In this case, the liability increase and any future reductions in the liability should the asymmetric risk reserve decrease will be split 80/20 between policyholder and shareholder.

Alternatively, the guarantee can be deemed to be a benefit that is offered by the shareholder to the policyholder and consequently, the increase in liability would be allocated to shareholder profits. In this case, a subsequent reduction in the BEL or in the total policy liability due to a reduction in the asymmetric risk reserve will have to be split 80/20 between policyholders and shareholders under the Life Act.

The inconsistency created by this interpretation of AASB1038 and LPS1.04 leads to shareholders being potentially liable for any increases in the asymmetric risk reserve but only 20% of the decreases. Under average levels of equity market and bond market volatility, regular increases in the asymmetric risk reserve are not unlikely. Hence, consistent application of this approach could lead to additional benefits for policyholders and additional costs for shareholders.

A possible alternative to manage the potential inconsistency between the Life Act and LPS1.04 is to hold the asymmetric reserve as a separate reserve outside the policy liability and not as part of the value of supporting assets (although still within the statutory fund). There are no clear directions or guidelines under LPS1.04 that prescribe or justify this approach, but it is a pragmatic way to recognise the impact on profit of movements in the asymmetric risk reserve as well as provide additional protection to policyholders.

Under this approach there is likely to be increased volatility in reported profits.

Example 2 - Increase the BEL and Decrease Future Profit Margins

The approach to increase the BEL and decrease the future profit margins is typically used for assumption changes that are not related to investment markets and, under the VSA methodology, to allow for the crediting rates and bonus rates applied over the reporting period.

As in Example 1, taking into account the considerations discussed in paragraph (g) of Appendix A4.1, this example assumes that the PRP are exhausted in the modelling underlying the calculation of the asymmetric risk reserve and may therefore not be available to support funding the asymmetric risk reserve. Furthermore, offsetting the increase in the BEL due to the asymmetric risk reserve with a decrease in the future profit margins, means that exclusion of the future profit margins from the calculation of the asymmetric risk reserve may be appropriate.

Increase the BEL and Decrease Future Profit Margins – What Do the Standards Say?

Standard LPS1.04 is clear on the need to have regard for asymmetric risk in determining the BEL:

> "3.9 In determining the Best Estimate Liability and Best Estimate Assumptions, the Actuary must have regard to the impact on the liability of the distribution of potential future outcomes. Where the benefits being valued contain options that may potentially be exercised against the company, or the potential liability outcomes have an adverse asymmetrical distribution, then the Best Estimate Liability must include an appropriate value in respect of those options and/or asymmetries."

The most transparent way to have regard for asymmetric risk is through an explicit asymmetric risk reserve.

Increase the BEL and Decrease Future Profit Margins – Complications

The asymmetric risk reserve can change for many reasons, including assumption changes or methodology changes in the calculation of the reserve. Consideration may have to be given to the reason for the change in the asymmetric risk reserve.

Before inclusion of the asymmetric risk reserve, the BEL reflects net cash-flows and for participating business, subsequent crediting rates and bonus rates already allocated to policyholders. For a participating book, the asymmetric risk reserve generally reflects the policyholder benefit that these net cash-flows plus credited earnings and bonus rates are guaranteed not to reduce in value.

The value of this guarantee can vary over time and hence the BEL will vary over time. The assets to back vested benefit increases from credited earnings and bonus rates are offset in the profit and loss statement by changes in the Interest Equalisation Reserves and Policyholder Retained Profits respectively.

The vested benefits are different from the asymmetric risk reserve (which can increase and decrease, and potentially reduce to zero). Offsetting movements in the asymmetric risk reserve with changes in the future profit margins is in a way similar to

offsetting the impact of investment market fluctuations in the value of supporting assets against the value of future profit margins, both policyholder and shareholder.

In this case, consideration can be given to offsetting the movement in the asymmetric risk reserve against both policyholder and shareholder (generally 80/20) or to offset movements in the asymmetric risk reserve only against shareholder future profit margins.

If both policyholder and shareholder future profit margins are used, no further complications arise. Within this approach, the shareholder may still decide to fund any future losses from the guarantee on the vested benefits and state so in notes to the accounts.

If only shareholder profit margins are used, the planned profit margins will no longer be split (generally) 80/20 between policyholder and shareholder. The policyholder planned profit margins will be greater than 80%, which is allowed under the Life Act, LPS1.04 and AASB1038. During the time that the asymmetric risk reserve is greater than zero and therefore future profit margins are not split 80/20 between policyholder and shareholder, reported profits are not released 80/20 between policyholder and shareholder. The shareholder would not be able to recover this deviation from the 80/20 split of profits in future years. However, a decrease in the asymmetric risk reserve would be allocated 100% to the future shareholder profits. The shareholder could then recover most or some of the initial reduction in future shareholder profit margins.

Example 3 – No Explicit Asymmetric Risk Reserve

Under this interpretation of LPS1.04, there is no explicit calculation of an asymmetric risk reserve. Not having an explicit asymmetric risk reserve may still be compliant with LPS1.04 if the asymmetric risk is allowed for implicitly by reflecting it through a lower best estimate earning rate.

No Explicit Asymmetric risk reserve - Standards

LPS1.04 does not explicitly prescribe the inclusion of a separate asymmetric risk reserve. However, it is clear that the BEL without regard for asymmetric risks is expected to be different from the BEL with regard for asymmetric risks:

> "3.9 In determining the Best Estimate Liability and Best Estimate Assumptions, the Actuary must have regard to the impact on the liability of the distribution of potential future outcomes. Where the benefits being valued contain options that may potentially be exercised against the company, or the potential liability outcomes have an adverse asymmetrical distribution, then the Best Estimate Liability must include an appropriate value in respect of those options and/or asymmetries."

Having regard for asymmetric risk does not mean that a separate reserve must be held. LPS1.04 provides alternatives to valuing the asymmetric risks:

> "5.3 Valuing Liability Options
>
> 5.3.1 The Best Estimate Liability and Best Estimate Assumptions are to have regard to any options or asymmetrical distribution of liability outcomes.
>
> 5.3.3 However, the Actuary needs to consider and assess the extent that variations in the assumptions may be correlated, and/or may compound one another, in adverse circumstances. In such cases the Best Estimate Assumptions must be adjusted so that the Best Estimate Liability is representative of the mean of the distribution of the potential liability outcomes.
>
> 5.3.4 Where the benefits contain options that may be exercised against the company, then either the value of those options must be determined (via a suitable option pricing method) and added to the Best Estimate Liability, or the Best Estimate Assumptions adjusted so as to appropriately capture the value of the options as part of the Best Estimate Liability."

This may be interpreted to mean that changes in the value of the asymmetric risk can be reflected in the BEL through changes in the best estimate earnings rate. Obviously, an increase in the risk is expected to lead to a lower best estimate earnings rate and vice versa. If this approach were to be adopted, any changes in the BEL would, in the normal course of events, be offset by changes in both the shareholder and policyholder future profit margins.

A4.3 EXAMPLES OF THE APPLICATION OF ASYMMETRIC RISK VALUATIONS UNDER LPS1.04 AND AASB1038 – LIABILITY ADEQUACY TEST FAILED

In some areas, LPS1.04 and AASB1038 are aligned in their definition of the liability adequacy test (LAT). For participating products, under both standards the policy liability needs to be tested against the BEL calculated on a risk free rate. However, there are areas of ambiguity and difference between LPS1.04 and AASB1038. The following covers two examples of possible interpretations of the standards.

Application of the Liability Adequacy Test - No Explicit Asymmetric Risk Reserve

Before moving to the examples, this section will briefly cover the basis for the calculation of the asymmetric risk component of the BEL for the liability adequacy test.

One interpretation is that the BEL calculated for the liability adequacy test (BEL_{RFR}) can be calculated on a deterministic basis on a risk–free rate. In that case, a BEL would be calculated without explicitly allowing for the asymmetric risk. In Example 3 in

Appendix A4.2, the asymmetric risk was allowed for implicitly through (a reduction of) the best estimate earning rate. It may be appropriate to allow for the asymmetric risk for the LAT in a similar way (that is, through a reduction in the earning rate). However, using a discount rate for the LAT that is different from the risk free rate may contradict LPS1.04.

Section 11.5 of LPS1.04 states:

> "11.5 The Adequacy Threshold for the Value of Future Best Estimate Bonuses and Shareholder Profits under Related Product Groups in respect of benefits that are contractually linked to the performance of the assets held (i.e. where a risk free discount rate is not used to discount future expected cash flows) is equal to the difference between:
>
> a) the Best Estimate Liability on Basis 2 (either in accordance with paragraph 9.1.3 or paragraph 10.1.3, whichever is applicable), but using a risk free discount rate (or rates) based on the current observable, objective rates that relate to the nature, structure and term of the future liability cash flows; and
>
> b) the Best Estimate Liability on Basis 2."

A literal interpretation would preclude any further adjustments being made to the risk free rate, but a reduction to allow for asymmetric risk may nonetheless still be appropriate.

An alternative and more common interpretation is to apply the LAT by using the same process as for the BEL on best estimate assumptions, including an assessment of the asymmetric risk. This interpretation may be seen as being more in line with the standards.

Application of the Liability Adequacy Test – Loss Recognition

Under the LAT no decision needs to be made on whether an increase in BEL can be offset against future profit margins, unlike the examples discussed in Appendix A4.2. However, there is still some ambiguity in the standards on how to recognise any losses. The main area of possible contention is around the inclusion of PRP in the test. Two examples are discussed below where the BEL_{RFR}, including the assessment for asymmetric risk, is greater than the VSA.

Example 1 – Use PRP to Meet the Liability Adequacy Test

In the first example, the excess of the BEL_{RFR} over the VSA is tested against the PRP[2] and SRP. Here are two scenarios that are distinguished:

Scenario 1a:

> If the BEL_{RFR} is less than the VSA + PRP + SRP, then the LAT may be partly supported by PRP. However, shareholder support would be required as well, equal to 20% of the total support required. In formulas:
>
> If BEL_{RFR} < VSA + PRP + SRP then Policy Liability = VSA + PRP + 20% * (BEL_{RFR} – VSA)
>
> In the year that the LAT is failed for the first time, the shareholder profit impact under this scenario would be a loss of 20% * (BEL_{RFR} – VSA).

Scenario 1b:

> If the BEL_{RFR} is greater than the VSA + PRP + SRP, then there is not enough support in the PRP for the LAT and shareholder support is required, equal to the full amount of the shortfall. In formulas:
>
> If BEL_{RFR} > VSA + PRP + SRP then Policy Liability = BEL_{RFR}
>
> In the year that the LAT is failed for the first time, the shareholder profit impact under this scenario would be a loss of (BEL_{RFR} – VSA – PRP).

Example 1 – Use PRP to Meet the Liability Adequacy Test – What do the Standards Say?

There are a number of sections in the standard that support this approach.

Section 17.5.2 of AASB1038 includes the PRP as part of the (policy) liability:

> "17.5.2 A life insurer that has issued participating business may have "retained profits" generated from that business. In relation to Australian participating policyholders, these "retained profits" are liabilities in accordance with the Life Insurance Act."

As the PRP is deemed to be part of the policy liability under AASB1038, it may be deemed reasonable to test the BEL_{RFR} against VSA plus the PRP.

Section 9.2.5 of AASB1038 deals with participating products and "topping up" of vested benefits:

[2] Section 17.5.2 of AASB1038 includes the PRP as part of the (policy) liability.

> "9.2.5 Where a life insurer "tops up" the vested benefits from previously recognised unvested policyholder benefits liabilities, a transfer between liabilities is recognised. If a life insurer tops up the vested benefits for participating policyholders other than from unvested policyholder benefits liabilities, the amount of the "top up" is recognised as an expense of the reporting period in which the additional benefits are vested."

From this it could be concluded that PRP can be used to "top up" the vested benefits if required. Passing the LAT with the support of the PRP may then require a formal transfer of liability from the PRP to the VSA.

Example 1 – Use PRP to Meet the Liability Adequacy Test – Complications

One complication is the same as that for Example 1 in Appendix A4.2: from a shareholder point of view, the loss is irreversible. Once the liability has been increased and the cost of the increase in the liability has been allocated 100% to shareholder, under section 60 of the Life Act, a subsequent decrease in the policy liability due to a reduction in the asymmetric risk reserve cannot be allocated 100% to shareholder and must be split (generally) 80/20 between policyholder and shareholder.

As in the examples in Appendix A4.2, the considerations discussed in paragraph (g) of Appendix A4.1 can be taken into account. If the PRP are used in this way to pass the LAT, then exclusion of the PRP in the calculation of the asymmetric risk component of the BEL_{RFR} may be required. The same applies to the future profit margins; these would, in this case, reasonably be expected to be excluded from the calculation of the asymmetric risk component of the BEL_{RFR}.

Example 2 – Only Use VSA to Meet the Liability Adequacy Test

The alternative to the approach in Example 1 is to test the VSA against the BEL_{RFR}, without support of the PRP. In this case, a shortfall of the VSA relative to the BEL_{RFR} leads to a shareholder loss. In formulas:

If BEL_{RFR} > VSA then Policy Liability = BEL_{RFR}

In the year that the LAT is failed for the first time, the shareholder profit impact under this scenario would be a loss of 100% * (BEL_{RFR} – VSA).

Example 2 – Only Use VSA to Meet the Liability Adequacy Test – What do the Standards Say?

The rationale for this approach can be found in LPS1.04. The overview of Section 4 describes the policy liability to be equal to the BEL plus future profit margins for shareholders and policyholders, but not the PRP:

"Participating Benefits

Where Participating Benefits are provided the policy owner is entitled to share in the profits of the business. The participation process is managed by the life company, through the declaration of Bonuses. Company practice, and ultimately the requirements of the Act, control the relationship between policy owner and shareholder entitlements to profits.

The profit for Participating Benefits includes provision for:

• Bonuses (policy owner profits); and

• Shareholder Profits.

Policy Liability = Best Estimate Liability

plus Value of future Best Estimate Bonuses

plus Value of future Best Estimate Shareholder Profits"

The need for immediate recognition of the shortfall is based on Section 3.7 of LPS1.04, which states:

"3.7 When the valuation results in expected future profits for a Related Product Group that are below the Adequacy Threshold for that product group, the value of the shortfall must be recognised immediately as a loss."

Section 11.5 of LPS1.04 describes that only the expected future profits are to be used to meet the Adequacy Threshold.

Section 11.5 defines how the Adequacy Threshold Is calculated:

"11.5 The Adequacy Threshold for the Value of Future Best Estimate Bonuses and Shareholder Profits under Related Product Groups in respect of benefits that are contractually linked to the performance of the assets held (i.e. where a risk free discount rate is not used to discount future expected cash flows) is equal to the difference between:

a) the Best Estimate Liability on Basis 2 (either in accordance with paragraph 9.1.3 or paragraph 10.1.3, whichever is applicable), but using a risk free discount rate (or rates) based on the current observable, objective rates that relate to the nature, structure and term of the future liability cash flows; and

b) the Best Estimate Liability on Basis 2."

The difference in the definition of the policy liability under AASB1038 and LPS1.04 and the different descriptions of the adequacy test under AASB1038 and LPS1.04 lead to different interpretations.

Example 2 – Only Use VSA to Meet the Liability Adequacy Test – Complications

The complication is the same as that for Example 1 in Appendix A4.2 and Example 1 above: from a shareholder point of view, the loss is irreversible. Once the liability has been increased and the cost of the increase in the liability has been allocated 100% to shareholder, under section 60 of the Life Act, a subsequent decrease in the policy liability due to a reduction in the asymmetric risk reserve cannot be allocated 100% to shareholder and must be split (generally) 80/20 between policyholder and shareholder.

Again, the considerations discussed in paragraph (g) of Appendix A4.1 can be taken into account. Unlike in Example 1, where *exclusion* of the PRP in the calculation of the asymmetric risk component of the BEL_{RFR} may reasonably be required, for Example 2, the *inclusion* of the PRP in the calculation of the asymmetric risk component of the BEL_{RFR} would be a more reasonable approach.

However, just like in Example 1, exclusion of the future profit margins in the calculation of the asymmetric risk component of the BEL_{RFR} would reasonably be required as the excess of the BEL_{RFR} over the BEL is compared to the future profit margins.

END OF INFORMATION NOTE