

# THE SOCIETY OF ACTUARIES IN IRELAND

## ACTUARIAL STANDARD OF PRACTICE FIRM-1

### INVESTMENTS - DERIVATIVE INSTRUMENTS

#### Classification

Recommended

**MEMBERS ARE REMINDED THAT THEY MUST ALWAYS COMPLY WITH THE PROFESSIONAL CONDUCT STANDARDS, AND THAT ACTUARIAL STANDARDS OF PRACTICE IMPOSE ADDITIONAL REQUIREMENTS UNDER SPECIFIC CIRCUMSTANCES.**

#### Legislation or Authority

Insurance Act 1989

European Communities (Life Assurance) Framework Regulations 1994

#### Application

Actuaries giving actuarial advice or opinion to an insurance company, pension scheme or other financial institution providing either an actuarial opinion on liabilities which has regard to the nature of assets or advice on risk exposures which in either case are, or could be, dependent on the use and control of derivatives.

This ASP encompasses the responsibilities of an Appointed Actuary. It is not intended to apply to insurance futures or options.

| <b>Version</b> | <b>Effective from</b> |
|----------------|-----------------------|
| 1.0            | 25.04.1995            |
| 2.0            | 03.09.1997            |
| 2.1            | 30.12.2006            |

#### Definitions

“*ASP*” means Actuarial Standard of Practice

“*the Financial Regulator*” means the Irish Financial Services Regulatory Authority

“*the Regulations*” means the European Communities (Life Assurance) Framework Regulations 1994

## **1 Introduction**

- 1.1 Use can be made of derivatives such as futures, forwards, options and swaps (or similar instruments or securities which have derivative characteristics) by organisations advised by actuaries. These instruments allow organisations to manage their risk exposures in ways that often cannot be achieved (or cannot be achieved as efficiently) by more traditional means. Yet these same characteristics also make it possible for risk exposures to be mismanaged, with potentially serious consequences.
- 1.2 The possible mismanagement of risk exposures is not a problem unique to derivatives. However, some forms of derivatives may be difficult to control or analyse. By using derivatives it is often possible to make larger shifts in market exposures more quickly than by more traditional means. The underlying assets and liabilities may have characteristics which are hard to follow and contracts may be complex in nature and involve market and counterparty risks of sorts not usually experienced with other investments. These challenges mean that it may be dangerous for actuaries to express a view as to the soundness of assets and liabilities, including derivatives, without proper expertise in this area.
- 1.3 This ASP deals with:-
  - 1.3.1 the risks to be addressed by prudent management controls (Section 2);
  - 1.3.2 assessing the adequacy of such controls (Section 3);
  - 1.3.3 quantifying the financial impact of derivatives on the risk exposure and asset/liability management of a financial institution (Section 4);

## **2 Prudent management controls**

- 2.1 The management of an organisation advised by an actuary is normally the responsibility of a Board of Directors or Trustees.
- 2.2 In certain instances the organisations concerned, or their policyholders or beneficiaries, may be expecting the actuary advising them to note deficiencies in the ways in which they are being run, including deficiencies in procedures involving derivatives.
- 2.3 The Regulations require insurance companies to have administrative and accounting procedures and internal control mechanisms which in the opinion of the Financial Regulator are sound and adequate encompassing all of the insurers' activities, including the use of derivatives. The Regulations also set out criteria which must be fulfilled. In complying with ASP LA-1 Appointed Actuaries of

life assurance companies will need to appraise themselves of whether these systems exist for investments and in particular whether suitable controls are in force concerning derivatives. Inter alia Appointed Actuaries need to satisfy themselves that suitable reserves or provisions exist including potentially some relating to derivative contracts. The appropriate sizes of these reserves or provisions may be influenced by the quality of the management controls in force.

- 2.4 The range of advice given by an actuary advising a general insurance company may depend on the terms of reference or employment of the actuary, and this may or may not include advice in relation to derivatives.
- 2.5 The Scheme Actuary to a pension scheme is required to consider the nature of the assets held by the scheme and their appropriateness to the form and incidence of the liabilities. However, the Scheme Actuary will not normally have a responsibility to monitor and review the controls in force on the use of derivatives. This responsibility would normally lie with the fund manager, the Trustees and (in a strategic sense as to whether the use of derivatives was appropriate for the scheme) with the Trustees' investment adviser. Where an actuary is not personally responsible for ongoing monitoring, the actuary should draw the attention of the Trustees to the need for such monitoring.
- 2.6 The frequency of internal reporting and the frequency of any margining arrangements will generally be important in assessing the adequacy of management controls and where appropriate in meeting the actuary's duties of continuous review. For example, if the organisation makes extensive use of derivatives then it is likely to have a schedule prepared showing on a daily basis the number and type of derivative transactions undertaken, the gross and net market exposures involved and the sensitivity of the portfolio to large market movements. If an actuary has an ongoing responsibility to comment on or assess whether exposures are being satisfactorily monitored, arrangements should be made to receive suitable summaries and exception reports at intervals appropriate to the task being undertaken, and to have access to the full schedules on demand. An actuary may need to require that any sufficiently material breach of investment restrictions in relation to derivatives should be immediately reported to the Board.

### **3 Assessing the adequacy of control procedures**

- 3.1 If the scope of the advice being given by an actuary involves assessing whether adequate controls exist on the use of derivatives then the actuary should:
  - 3.1.1 obtain from the Directors, Trustees or others responsible for the management of the organisation copies of the objectives and policies laid down for the use of derivatives. Where separate guidelines exist for different funds then the actuary should obtain copies of each set of guidelines. An actuary should also be fully aware of how guidelines for the use of derivatives relate to overall investment guidelines.

- 3.1.2 seek information on the extent to which compliance with these objectives and policies is monitored and enforced within the organisation and to what extent they:
- (i) define the instruments that may be dealt in by the organisation, and the margining arrangements required for the various instruments;
  - (ii) identify limits on exposures or volumes (encompassing both credit risk and risks from market movements), where appropriate aggregating such exposures with those incurred through non-derivatives activities and taking into account arrangements with counterparties such as netting agreements;
  - (iii) delineate the type of counterparties with which the organisation can deal (e.g. by reference to credit ratings);
  - (iv) specify that contracts are the subject of legal advice, particularly where there may be mutual obligation between parties.
- 3.1.3 seek information on the extent to which the organisation's use of derivatives and interpretation of such terms as "reduction in risk" and "efficient portfolio management" satisfies statutory rules, prudential guidance or codes of practice published by relevant statutory authorities).
- 3.1.4 seek information on whether senior management with responsibility for control of derivative instruments is sufficiently independent of those concerned with trading and day-to-day management of derivatives, has sufficient understanding of the derivatives contracts being used and is provided with sufficient statistics and information (suitably summarised) to be able to exercise effective management control.
- 3.1.5 understand that the management of some types of derivative positions may need to be dynamic, and identify whether the management team is sufficiently large, and sufficiently skilled, to undertake this work and to understand its limitations. A range of skills may be needed, both within the derivatives team and within more senior management.
- 3.1.6 understand that the tax treatment of some derivatives is complex and should have access to suitable tax expertise.
- 3.1.7 understand that derivatives or equivalent instruments may be bought solely to match some underlying liabilities. Even in these circumstances, however, risk exposures may still arise (e.g. counterparty risk or the possible purchase of too much or too little exposure) which need proper management.

- 3.1.8 understand that for some types of derivatives, standardised forms of legal agreement exist. If these are not used then this may indicate deficiencies in the system and controls in place.
- 3.1.9 rely where appropriate on the advice of other professionals. When forming an opinion on these matters, the actuary should indicate in advice given whether this is the case, and it would be prudent for this to include suitable disclaimers if the information supplied to them is incomplete.
- 3.2 If the actuary is unable to form a view on the quality of the control systems, or believes that they are deficient, then the actuary may need to qualify the advice being given to this effect and make suitable allowance for this if quantifying the financial impact of derivatives.
  - 3.2.1 Paragraph 2.3 of ASP LA-1 requires an Appointed Actuary to ensure that the necessity for information outlined in paragraph 3.1 (above) is fully understood by the company and that suitable arrangements are made to ensure that this information is forthcoming. If the company fails to supply such information the Appointed Actuary may need to qualify his certificate concerning the financial state of the company.
  - 3.2.2 The materiality of derivative holdings in assessing such issues should be judged in the context of the exposure or risk of loss on a cautious basis and not necessarily on the value assigned to them in the valuation of assets or liabilities.

#### **4 Quantifying the financial impact of derivatives**

- 4.1 When assessing whether suitable reserves or provisions exist in respect of derivative contracts entered into by an organisation an actuary should:
  - 4.1.1 have access to sufficient expertise independent of the party that has sold the derivative fully to assess the value of the derivatives within the context of the assets and liability and the risk involved.
  - 4.1.2 where realisable values are being assessed, consider carefully whether the values placed on both traded and "over-the-counter" (i.e. ones not traded on an exchange) derivatives adequately reflect their realisable values or, if the derivative constitutes a liability, whether the provision or reserve established is at least sufficient to meet an appropriate estimate of the cost of closing out the derivative position involved.

Particular care may be needed if the organisation is replicating or hedging the effects of derivative exposures using "dynamic hedging" or other portfolio insurance techniques.

- 4.1.3 note that, depending on the purpose of the advice, appropriateness might require the application of prudence. For example, an actuary may be assessing the level of risk capital required for an organisation like an insurance company or a bank. An appropriately prudent assessment would then be needed, bearing in mind how the risks were being hedged or otherwise controlled (and the limitations of such techniques). Statutory rules may also be applicable.
- 4.1.4 note that for over-the-counter derivatives (or other derivatives dealt in relatively infrequently), obtaining a reasonable estimate of realisable value may be difficult. There is a need to consider carefully whether such an estimate reflects what the derivative might actually realise on closing out of the derivative position. This will be of particular concern where there is not a close match between assets and liabilities. Particular care should be exercised if the organisation supplying the estimate is linked to the party which has sold the derivative. An actuary should be satisfied as to the reasonableness of estimates supplied by others.
- 4.1.5 An actuary should recognise the element of judgement that is required in the models used for valuing such derivatives (and in the parameters that may need to be entered into such models) and should also bear in mind "model risk", i.e. the risk that the model being used proves inaccurate or does not capture some fundamental characteristic of the market in question. If the estimates are prepared in-house then care should be taken to ensure that any computer programs used are suitably controlled, validated and documented.
- 4.1.6 ensure that any model used is reasonable in the context of historic experience, especially the price movements of the investment underlying the derivative, and the contingency being covered.
- 4.1.7 take particular care if the organisation is seeking to replicate or hedge the effects of derivative exposures using "dynamic hedging" or other portfolio insurance techniques. In particular, an actuary should note the limitations of such techniques, e.g. that it may be difficult or impossible to replicate the effects of derivative exposures if markets jump suddenly or if the underlying behaviour of the market changes significantly.
- 4.1.8 bear in mind the purpose for which the derivative is being used and the degree to which the derivative asset or asset or liability matches a corresponding liability or asset (whether insurance or otherwise) of the organisation. To do so in an insurance context an actuary will need to take into account both the possibility that the relevant insurance policies may not remain in force until maturity, and also the terms if any on which it is possible to close out the derivative transaction prior to its maturity.

- 4.1.9 bear in mind that the realisable value of or liability arising from some derivatives can change rapidly as markets move. An actuary should be careful, if needing valuations as at a given date, not to rely unduly on valuations struck even a short time from that date. For many types of derivatives it is desirable for organisations to revalue or "mark to market" their derivatives daily to avoid calculating internally misleading exposures and valuations.
  - 4.1.10 ensure that the valuation of the liabilities is consistent with that of the assets. This may not always involve valuing derivatives at realisable value, but the actuary should beware of valuing derivatives at above realisable value.
  - 4.1.11 bear in mind the impact that derivative positions can have on the organisation's investment portfolio if extreme movements in markets occur (e.g. the potential impact of meeting margin requirements, having positions involuntarily closed if such margin payments cannot be met, or how the effects of market movements can be potentially exacerbated by the use of derivatives). In assessing the risks involved, an actuary should have regard to resilience tests of the value of assets and liabilities in the event of sharp adverse price movements in the instruments underlying the derivative. In making these tests the actuary should consider carefully the value to be placed on the derivatives in the changed investment conditions.
  - 4.1.12 check that appropriate allowance has been made for the aggregation of counterparty risk and market exposures (e.g. when applying for admissibility limits for insurance companies) for all investments including both assets and liabilities. An actuary should pay particular attention to the effect on counterparty exposures following large market price movements. Resilience testing could be extended to consideration of counterparty failure. An actuary should also check whether suitable controls are in place to ensure that the organisation can control the impact of these aggregations e.g. for an insurance company the effect on the amount of inadmissible assets being held.
  - 4.1.13 where acting in the capacity of pension scheme actuary, consider how to make allowances for the presence of derivatives when determining the actuarial basis for valuation of both assets and liabilities.
  - 4.1.14 consider the possibility of establishing provisions or reserves to allow for contingencies such as changes in the tax treatment in the contract involved.
- 4.2 Appointed Actuaries of life assurance companies should also:
- 4.2.1 note that although they may technically be responsible for determining the mathematical reserves required for insurance liabilities only, ASP LA-1

makes it clear that they must do so only after considering how the company's assets and other liabilities (including derivatives) have been valued, taking into account the degree to which assets match liabilities (whether those liabilities are insurance or non-insurance in nature).

- 4.2.2 note the need to pay particular attention to "uncovered" derivative positions and in particular the requirement under Article 3 of Annex IV of the Regulations to make appropriate provision against the effects of possible future changes in the value of the assets on their adequacy to meet the liabilities since there may be need to comment on it under Schedule 4. Under the Regulations such positions would normally have nil or negative value.
- 4.2.3 when establishing an appropriate provision under Article 3 of Annex IV of the Regulations, take account of the impact derivative positions might have on the overall financial position of the company. Appointed Actuaries need to be aware that some derivative positions may exaggerate the effect of market movements whilst others may mitigate them and that derivatives need to be assessed not just in isolation but also bearing in mind the other assets and liabilities of the company. Prudent provision must be made against the effects of possible future changes in the value of assets in accordance with Article 3 of Annex IV of the Regulations.
- 4.2.4 consider the effect derivative positions may have on the income or redemption yield of the portfolio, and bear in mind the ability of some derivatives effectively to convert income into capital gain or vice versa, and the guidance given in paragraph 3.3.3 of ASP LA-3.
- 4.2.5 note that the yield on the portfolio may be used by Appointed Actuaries to help them in the choice of some of the assumptions used in the valuation of insurance liabilities, and will also affect the maximum rate of interest acceptable to the supervisor when valuing the liabilities for solvency purposes. Appointed Actuaries should satisfy themselves that adjustments they make to the portfolio yield to take account of the company's derivative positions are both appropriate in the context of the purpose of their valuation, and, if relevant, are permitted by the appropriate legislation. Such adjustments should also take into account any increased default risk from the holding of assets in derivative form.
- 4.2.6 consider the responsibilities of paragraph 2.4 of ASP LA-1, should the company pay insufficient regard to prudential advice given.
- 4.2.7 ensure continuous assessment of derivative holdings to fulfil the responsibilities under paragraph 2.1 of ASP LA-1.



- 4.2.8 pay due regard to specific responsibilities in relation to derivatives investments as set out in Paragraph 4.12 of ASP LA-1.
- 4.2.9 have regard to Paragraphs 2.7.4 and 4.9 of ASP LA-2 when preparing an Actuarial Financial Condition Report.