Capital Requirements for Variable Annuities - Discussion Paper

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Insurance Supervision Department

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Introduction

Ireland has a number of insurance companies authorised to transact Variable Annuity ("VA") business (sometimes also called GMXB). Essentially this business may be characterised as business in which assets (often unit linked but can be index based or other forms) are supported by payout guarantees to the policyholder. It is clearly distinguishable from with profit business in that there is no discretion for the life company to change its asset strategy on the unit fund to reduce the cost of guarantees and there is no discretion to the company on level of payout. The guarantees are usually matched by a dynamic hedge program, i.e. one which will probably involve many trades prior to maturity of the product.

In recent years there have been a number of well publicised losses made by companies transacting this business and therefore it is necessary to examine reserving standards.

There is no peer reviewed standard generally accepted in EU Actuarial circles. We have outlined one possible methodology below for discussion but other methodologies may be suggested. We would stress that the suggestions made here are a starting point for discussion. In particular we would welcome responses from professional bodies. It is of course a matter for Appointed Actuaries of life companies to set reserves that are prudent and in accordance with Actuarial Standards of Practice. Therefore, when the methodology for capital requirements is determined the Regulator would expect to see an explanation of how any alternative method actually followed is prudent i.e. a "comply or explain" approach. It is intended that the methodology ultimately arrived at should deal with capital requirements and should be sufficiently prudent without addition of required solvency margin (i.e. Form 28 reserves plus RSM = capital required).

This is intended to be developed to apply to both insurance and reinsurance companies.

With the imminent approach of Solvency II, it is highly desirable that any method is also suitable for the new regime and we have sought to ensure that these proposals are a good fit. Nevertheless, with many of the details of Solvency II still to be clarified, further work may be required. We would particularly welcome responses that would improve the fit with the expected form of Solvency II.

We would appreciate responses to be submitted by 30.10.09. Responses can be sent to insurance@financialregulator.ie

With regard to other forms of guaranteed business, we would welcome discussion as to whether VA methodologies should apply.

It is important to note that we believe that the commencement of writing of VA's is necessarily a substantial departure from the basis of authorisation (see paragraph 18 (2) (d) of the 1989 Act) and we would expect to be informed well in advance by companies intending to extend their business offering to include VA's.

Suggested Methodology

Basic Principle

Companies transacting VA's should calculate required capital using stochastic projection methods of current assets and liabilities, assuming no credit for future trading or hedging (Basic Guarantees Liabilities or BGL). This should be based on adequate, applicable and relevant actuarial and statistical techniques.

Companies may then also calculate an offset for the impact of future trading ("FTO"). This may then be offset against the first calculation to an extent to be agreed in advance with the Financial Regulator.

Basic Guarantee Liabilities

The BGL should be calculated using a stochastic model based on assets and liabilities as at the valuation date.

It is not proposed at this stage to suggest a standard for either models or solvency measures (such as CTE or VAR). It is obvious that the degree of conservatism in such an approach depends on the interaction of these two factors. It would be expected that such models must be realistic or the test must be of suitable strength. Actuaries will be expected to be able to justify their choice of model and measure.

We suggest that the calibration of the model should reflect market conditions. In particular market volatilities should be taken into account. Traditionally, actuaries have used product life time projections and this is suggested to be still acceptable. However, the use of an approach where a one year projection plus full cost of changes in market value of assets and liabilities is also proposed to be permissible. This would involve the need to project stochastic variation in volatility to reflect the fact that the market value of embedded options will be subject to variation. Such a projection should be at no weaker level than 99.5% VAR. This approach must also allow for potential changes in the market value of embedded options.

We suggest that shock tests should be used as reasonability checks of the results from modelling.

Future Trading Offset

Future trading offset would be calculated by stochastic projection. It should reflect the hedging program that is in place at the time of the valuation. The liability cost from the stochastic program allowing for future

trading should be subtracted from the Basic Guarantee Liabilities to give the FTO.

It is envisaged that the FTO would only be allowed to be applied to a pre-justified percentage (Percentage Offset Credit or "POC"). That would depend on a number of factors including:-

a) Clearly Defined Hedging Strategy

To gain any allowance from future trading it is necessary to have a clearly defined hedging strategy. Criteria for this are set out in the Academy of Actuaries 2005 paper "Recommended Approach for setting Regulatory Risk-Based Capital Requirements for Variable Annuities and Similar products"

b) Proven Operation of Hedging Program

The experience of the hedging program over all periods that it is in operation should be analysed on a realistic basis (i.e. all assets/liabilities valued at market value). Profit attributions should be done at a frequency greater than annually, identifying causes of profit and loss.

It is unlikely that a new venture without a proven record in hedging would be given a significant POC unless it can be demonstrated that it has acquired such in some way. For example experience gained in other group operations, or by staff having experience in other companies or by the use of consultancies. Simulation exercises prior to launch might also be valid.

c) Basis Risk

We define basis risk as that which exists because the guarantees are applied to investment funds that do not perform exactly as hedging instruments (usually based on markets) do. It would be expected that this should be analysed both statistically and analytically. This may be an important element in (b) above. It is necessary that this is examined separately but it is not intended to double count this.

d) Delay Risk

Stochastic models are often based on time periods that do not capture contagion of markets in different time zones and the impossibility of trading instantaneously. In addition market performance on different days might be correlated. This could lead to difficulties in carrying out trading programs sufficiently quickly in times of market upheaval. This should be assessed.

e) Testing Nature of Stochastic Model

The stochastic model (and assumptions used in it) which are used to project the effectiveness of the hedging program need to be sufficiently robust to model the behaviour of matching derivatives and the price at which they can be bought or sold. If the company is not hedging *vega*, *rho* or *gamma* then the impact of that decision must be measured. Models with constant volatility are not acceptable for such purposes.

Scenario testing or other forms of reasonableness tests would be expected.

It is anticipated that guidance on internal models under Solvency 2 will shortly be available as a consultative document. Ultimately, companies will have to satisfy these requirements when finalised.

f) Operational Risk and Governance

Operational risk (as defined under Solvency II) must be examined. It should be supported by regular testing, inspection and audit (both internal and external). Companies may be exposed to very significant risks, certainly potentially fatal to any group or company and adequate governance is vital.

Boards of companies should be seeing detailed and meaningful information on the performance of hedging programs.

g) Extent of modelling

We would expect to see large numbers of stochastic runs undertaken. Experience has shown that for some types of models the extreme

adverse scenarios are very infrequent but very adverse. We would expect companies to have an understanding of this and to have procedures to identify and ameliorate such outcomes before exposure leads to insolvency. Such detailed analysis may not be necessary on every occasion, though this depends on the risk measure employed. Clearly CTE requires a much more accurate picture than a pure VAR approach; a 99.5% test requires more accuracy than 95%.

We would welcome comments on the number of iterations necessary to ensure reliability of results.

Data grouping must be approached carefully to ensure that important details are not lost. The grouping may need to be justified.

We would appreciate suggestions on how this could operate in practice.

Other Assumption and Valuation elements

Solvency I still applies and the valuation reserves should allow for usual Solvency I practice.

It is not proposed at this stage to relax the condition of requiring 100% persistency for direct insurance (unless such an assumption reduces liabilities). For reinsurance, it is intended that prudential persistency may continue. Note that experience shows that products with guarantees in the money will suffer low levels of exit until guarantees vest and high levels of uptake of guarantee options, and this should be included in the submission for POC for reinsurance companies.

Prudence needs to be applied to demographic assumptions as appropriate

Reinsurance

We would propose that the above should apply even to companies where the liability is reinsured fully onwards as assessment of credit exposure is

important both under Solvency 1 and 2. In such cases, the gross reserves would reflect the BGL without any FTO.

New business

It is believed that some companies might experience difficulties in raising their charges for guarantees on new business even when the market cost has risen substantially. We suggest that this needs consideration also.

Other Possible Methods

We would appreciate contributions that might propose other methodologies. Is it possible to define a simple factor based model that is still adequately prudent?