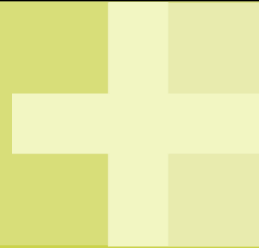


# CEIOPS Consultation Paper No. 42

## Draft L2 Advice on TP - Risk Margin

September 2009



# Barrie & Hibbert's Response to CEIOPS-CP 42: Draft L2 Advice on TP -Risk Margin

## CEIOPS Reference: 3.47

Regarding the treatment of market risk in the risk margin, CEIOPS is proposing a substantial change compared to QIS4. Stakeholders are asked to comment in particular on the conceptual soundness of the proposal and its implications on the size of the risk margin. Moreover, comments in order to ensure a practicable inclusion of market in the risk margin are welcomed.

We believe there are two viable approaches to allow for "unavoidable" market risk that meet the requirements of the Directive:

1. The method outlined in CP42 paragraph 3.43. Presumably this method would be used in conjunction with a calibration to market prices where available (and "deep, liquid and transparent"?) and to best estimate prices elsewhere. This would be necessary if the risk margin calculation is to avoid the double count effect described in the QIS4 Technical Specification and repeated in CP41 paragraph 3.3.
2. Calibrating to all available "active market" information, whether the market is "deep, liquid and transparent" or thinly traded. The IASB (see footnote<sup>1</sup>) and FASB (see footnote<sup>2</sup>) have both adopted the same definition of an "active market" and it is wider than the "deep, liquid and transparent" criteria. In cases where information is not available from an active market then the valuation inputs should be calibrated to extrapolated market information that reflects the assumptions that market participants would use when pricing including assumptions about risk. Thus, in the absence of active market information the valuation would be calibrated to extrapolated or 'pseudo' prices with a explicit market risk margin. In this case it would not be necessary to calculate a risk margin for "unavoidable" market risk as the values produced will already include a market risk margin. This approach is similar to that adopted for QIS4 but with the added requirement that all market information used in the calibration, whether extrapolated or otherwise, must contain a market risk margin.

A rich framework for generating economically coherent extrapolated prices containing explicit risk margins already exists. For example:

- Annex B CP-40 already makes reference to the B+H macroeconomic framework. As described in the our response to CP-40 the approach to setting a limiting assumptions for forward interest rates has four components:
  - A limiting long term real yield
  - A limiting long term inflation assumption
  - A convexity adjustment
  - A nominal term premium adjustment

The nominal term premium is a market risk margin and reflects the reward an investor requires for holding a longer term bond. Whilst we have assumed ultra long-term extrapolated forward interest rates contain a positive term premium, we 'respect' the term premium observable in long-term market rates in the extrapolation. It would be perfectly reasonable to make other, more conservative, assumptions.

A similar feature exists in the extrapolation of prices (or model-implied volatilities) for equity index and interest rate options beyond the terms quoted by market participants. Typically we choose to use a model to generate long-term option pseudo prices and parameterize the model with volatility assumptions that implicitly include a risk margin. The excess of implied volatility over expected ('realistic', real-world) long term volatility represents the risk margin that option writers charge for their capital costs and the risks they bear in hedging option exposures (see footnote<sup>3</sup>).

It is useful to consider some of the implications of the two approaches since, where we are pricing market risks, the implicit cost of capital generated by a model can be very different to the fixed 6% assumption used for non-market risks. Estimates using a fixed assumption for the cost of capital could be very different to estimates derived using an economic approach. Worse still, the method outlined in CP42 paragraph 3.43 could, in principle, produce economically 'impossible' prices and (inadvertently) introduce bias and/or arbitrage into models and model results.

<sup>1</sup> Para 48 of the May 2009 ED on Fair Value Measurement

<sup>2</sup> Para 24 of FAS 157

<sup>3</sup> See for example our research notes 'A comparison of realised and expected volatility', April 2009 and 'Understanding the "Fairness" of FTSE Index Option Pricing', April 2003.

## Which method makes the best use of market information?

1. The IASB and FASB both recognize the value in using market information from markets other than "deep, liquid and transparent" markets (see footnote4). They concluded that the market prices that are available from thinly traded markets are still the most reliable evidence of fair value. In cases where prices have to be extrapolated then the inclusion of a market risk margin means the resulting inputs to the valuation are consistent with market risk margins charged by market participants, again an approach supported by FASB and the IFRS. Using best estimate prices and a CP-42 risk margin does not use information available on the markets' risk margin. One of the stated aims of Solvency II is that it makes optimal use of the information provided by financial markets (see footnote5).
2. Using the markets' information increases the compatibility of Solvency II reporting with financial reporting. One of the stated aims of Solvency II is to limit the administrative burden placed on companies (see footnote6).
3. A consequence of using the risk margin approach to value unavoidable market risk is that companies who have hedged their market risk, e.g. by holding a replicating portfolio, may not gain the benefit of the hedge in their Solvency II reporting. The liability value will be calculated on a different basis to the value of the replicating assets. One of the expected consequences of Solvency II is that companies will seek to more actively manage their market risk. It would be unfortunate if the benefit of this activity was not evident in their Solvency II reporting.

## Numerical comparison of the market risk and the risk margin calculation approaches to valuing liabilities

We have prepared an example of a simple liability to illustrate the relative effect of the two approaches. We considered a simple liability of a 1 year contract with €100 invested in equity units but with a guaranteed minimum maturity value of €100.

Using best estimate assumptions we calculated the best estimate liability and a risk margin assuming that the market risk was unavoidable. We also calculated the technical provision using assumptions with a market risk margin in addition to the best estimate values – in this case the values were assumed to be extrapolated on thinly traded markets. In this example we ignored risks other than market risk.

For this simple liability we found the value of the liability using the risk margin calculation was lower than the equivalent figure based on the markets' implicit risk margin. By varying the strike price of the embedded option we obtained a series of values. For all the values we looked at the risk margin was lower than the equivalent market risk with the risk margin typically being, on average, over 30% below the market based approach. In the case of the furthest out-of-the-money option the risk margin value was only 10% of the market based approach. Full details of the assumptions and the basis of these calculations are described in an Insights article to be published on the B+H website (see footnote7).

No doubt if a different term and volatility (for example) combination had been chosen for this example a very different relationship could have been obtained between the risk margin values and their market consistent equivalent. The key point is that, in pricing non-hedgeable market risks, it is not at all obvious what the appropriate cost of capital should be. Exposures which embed large positive exposures to market risk (e.g. written put options) will require quite different cost of capital assumptions to exposures which contain negative exposure. It is our view that using a model is the most efficient method for simultaneously estimating coherent prices and implicitly applying an appropriate cost of capital. This issue does not arise for exposures which do not contain market risk. The CP-42 risk margin does not appear to us to be a good way to value market risk.

The insights provided by the analysis from the B+H article explains some of the difficulty the risk margin calculation experiences. For options the present value of best-estimate cash flows (using a risk-free rate) turns out to be quite different from the 'correct' option value and so the risk margin calculation specified in CP-42 is only an approximate correction. There is a well established body of research in support of the market risk calculation.

## Comment on the practicality of the CP-42 approach to calculating the risk margin.

We have two comments to make on the practicality of the proposed approach:

4 See for example the discussion in FAS 157 and the May 2009 Exposure Draft on Fair Value Measurement from the IASB

5 Solvency II Directive, Recitals, para 27

6 Solvency II Directive, Recitals, para 28

7 www.barrhibb.com "Understanding the market risk margin in option prices", September 2009

1. The proposed approach would require some calibration inputs to be based on market values and others to be based on best estimates. This will create a discontinuity in the outputs from the calibration e.g. the equity volatility surface. The discontinuity will occur when markets cease to be "deep, liquid and transparent". The point of discontinuity will vary from company to company since the "deep, liquid and transparent" definition depends upon the volume of transaction that will impact on the quoted price. There will inevitably be a degree of judgment in setting the boundary of the "deep, liquid and transparent" market. If the market risk approach is adopted, using extrapolated market prices and thinly traded information as appropriate, there is no discontinuity.
2. The identification of the portfolio of assets with the lowest market risk SCR is a considerable exercise in other than trivial situations. Some form of process to calculate a replicating portfolio would appear to be required with the selection criteria of the portfolio being the value of the market risk SCR. The alternative of using the markets' risk margin in the calibration is much more straightforward.

## In conclusion

The proposed treatment of unavoidable market risk does not use all the information available from the market on pricing risk and would introduce a source of incompatibility between Solvency II and financial reporting standards. There is a well developed framework of using market inputs to price market risk in situations where markets are not "deep, liquid and transparent".

For a simple liability the market-based framework produces answers that are significantly different from the treatment proposed in CP-42. This is a difference that can also be expected to be present in valuing complex liabilities with embedded market risks.

Finally, we see considerable practical difficulties in implementing the proposed approach.

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