Project **Insurance Contracts**

Topic **Draft application guidance for risk adjustment techniques**

## Introduction

1. This paper discusses the draft application guidance for measuring a risk adjustment, to be included in the forthcoming exposure draft on insurance contracts. That guidance describes, amongst others, how techniques for measuring risk adjustments would satisfy the proposed objective and characteristics of the risk adjustment.

2. This draft guidance is included in the appendix to this paper and uses draft guidance presented during an earlier meeting as a basis.[1]

## Background

3. In their May 18 joint meeting, the boards decided that, if the measurement model for insurance contracts were to include a separate risk adjustment, the range of available techniques for measuring that risk adjustment should be limited. [The IASB tentatively selected an approach with a separate risk adjustment and a residual margin. The FASB decided tentatively to use a single composite margin.]

4. As a follow-up, the boards discussed in their June 10 meeting which methods should be permitted to measure the risk adjustment. As part of that discussion, the boards noted the importance of the objective and the accompanying characteristics for the risk adjustment under the proposed insurance model. Hence, the boards asked the staff to:

   (a) (re)consider the articulation of the objective and characteristics of the risk adjustment.

[1] May 2010, Agenda paper 2B/FASB Memorandum 45B

(b) prepare draft guidance for the risk adjustment that also explains how various risk adjustment techniques would satisfy the characteristics under the proposed objective.

***Objective of the risk adjustment***

5. The proposed model for insurance contracts is based on the fulfilment of those contracts over time with policyholder. In their May meeting, the boards decided tentatively that the objective of the risk adjustment under that model is:

> **The maximum amount an insurer would rationally pay to be relieved of the risk <u>that the actual fulfilment cash flows may differ from those expected</u> ~~taking into consideration that the amount of benefits and claim costs actually paid may exceed the amount expected to be paid~~.**[2]

6. Staff concluded that this objective, by a reference to what the insurer would rationally pay, provides a certain degree of discipline. The draft guidance in the appendix is based on this objective. However, some Board members questioned whether the proposed objective provides sufficient rigour.

7. A possible way to deal with this concern and to strengthen the objective is to explain that the maximum amount the insurer would rationally pay should reflect what its investors require for the exposure to the risk in the insurance liability. This could arguably be a more objective reference point than just looking at what (the management of) the insurer requires, particularly when it comes to estimating the price element of risk. But in our view it still is consistent with a fulfilment notion because the objective is to reflect what the investors in the insurer would require for bearing the risks as that insurer fulfils the contracts (although that amount probably would be close or even identical to the amount that the investors would pay to be no longer exposed to the risk). An alternative objective that incorporates this notion could be drafted in the following way:

[2] This objective is modified for a drafting suggestion proposed by staff to make the wording of the objective for the risk adjustment more consistent with the wording of the overall objective of the proposed measurement model. This proposed drafting change does in our view not change the nature of the objective.

**the maximum amount an insurer would rationally pay to be relieved of the risk <u>that the actual fulfilment cash flows may differ from those expected</u> ~~taking into consideration~~ ~~that the amount of benefits and claim costs actually paid may exceed the amount expected to be paid~~<u>, reflecting the return the owners of the insurer require for bearing that risk</u>**

8. We have been unable to find further ways to modify this objective further without fundamentally its changing its nature (eg by changing it into a current exit price notion).

9. Another alternative objective that could be applied under a fulfilment value is one that refers to an amount that that is needed to meet the future cash flows at a specified degree of confidence, for example:

**<u>the amount the insurer needs at a [high] level of confidence for bearing the uncertainty inherent in the expected present value of cash flows arising from the fulfilment of the insurance contract.</u>**

10. This objective clearly links the risk adjustment to the fulfilment objective and thereby expresses the role of the risk adjustment in the measurement model. However, if the boards adopt this statement of the objective, they may need to clarify what they mean by [high]. Further, some of the concerns about a lack of discipline would probably still exist under this objective.

11. Other objectives mentioned during previous Board discussions are current exit prices (what would be the price for a transfer of the risk between market participants?) and current entry price (what would the insurer charge for taking on a similar risk?). However, those objectives differ from the objective for a fulfilment value. If the boards want to pursue those objectives for the risk adjustment, the boards would probably have to review the objective (fulfilment) for the measurement as a whole.

***Which techniques***

12. For the June 10 meeting, we proposed a list of three techniques that would be available for measuring the risk adjustment under the proposed objective, namely:

    (a) Confidence level (or Value at Risk)

    (b) Conditional Tail Expectation (or Tail Value at Risk)

(c) Cost of Capital

13. Considering the boards' tentative decision to limit the available methods to ensure a degree of comparability, the staff drafted the guidance on the basis of permitting those three methods.

14. Paragraph A4 of the appendix gives the characteristics that a risk adjustment must have to satisfy the objective. Some board members suggested that the three methods included in paragraph 12 may not meet those characteristics sufficiently. All three techniques proposed by staff may meet the characteristics in at least some situations, but not necessarily all. Furthermore, the degree to which they meet the characteristics may vary and depends on the circumstances. Therefore, the draft guidance in the appendix explains how the available techniques may meet the objective and, consequently, any circumstances under which they would or not be applicable the characteristics for the risk adjustment See in particular paragraphs A25-A30 of the appendix.

15. But in any situation, at least one of those techniques should be able to meet the characteristics to a sufficient degree, also considering that the boards concluded that the benefits of ensuring a degree of comparability and consistency by limiting the method outweighs the drawbacks of limiting judgement to use the most appropriate method in a particular circumstance. We further note that, when staff researched the range of techniques that currently exist for estimating a risk adjustment, no one technique appeared to be superior in all instances.[3]

[3] March 2010, Agenda paper 6D/FASB Memorandum 41D.

**Question for the boards**

Do you have any comments on the draft application guidance on cash flows included in the appendix to this paper, including the proposed objective for the risk adjustment?

Do you agree with the methods provided as part of this draft guidance? If not, which methods would you exclude from the list of applicable techniques? And are there any methods not proposed by staff that you would to like to include?

# APPENDIX- DRAFT APPLICATION GUIDANCE ON RISK ADJUSTMENTS

**A1. The risk adjustment shall be the maximum amount an insurer would rationally pay to be relieved of the risk <u>that the actual fulfilment cash flows may differ from those expected</u> ~~taking into consideration that the amount of benefits and claim costs actually paid may exceed the amount expected to be paid~~.**

A2. The risk adjustment conveys information to users about the effects of uncertainty associated with the cash flows arising from the contract. To achieve this, the objective of the risk adjustment is to measure the maximum amount that the insurer would rationally pay to be relieved of the risk that the actual fulfilment cash flows may differ from those expected.

A3. Because an insurer often would not be able to identify observable market information about risk adjustments, the entity will need to estimate the maximum amount it would rationally pay to be relieved of this risk.

A4. To meet the objective set out in paragraph A1, the risk adjustment shall, to the extent practicable, have the following characteristics:

(a) Risks with low frequency and high severity will have higher risk adjustments than risks with high frequency and low severity.

(b) For similar risks, long duration contracts will have higher risk adjustments than those of shorter duration.

(c) Risks with a wide probability distribution will have higher risk adjustments than those risks with a narrower distribution.

(d) The less that is known about the current estimate and its trend, the higher the risk adjustment should be.

A5. Selecting and applying techniques for determining risk adjustments requires judgement. Paragraphs A8-A30 provide information about the techniques available. Different techniques may be appropriate for different types of contract and for different circumstances. In applying its judgement, an insurer shall consider the following factors:

(a) Risk adjustments shall be explicit, not implicit. That is an important change from many existing practices that rely on estimates incorporating an implicit (and often unstated) degree of conservatism or prudence. Separating explicit estimates of future cash flows from explicit risk adjustments improves the quality of estimates and enhances transparency.

(b) The risk adjustment for an insurance liability shall reflect all risks associated with the liability.

(c) The risk adjustment for an insurance liability shall not reflect risks that do not arise from the liability, such as investment risk (except when investment risk affects the amount of payouts to policyholders), asset-liability mismatch risk, or general operational risk relating to future transactions.

(d) The technique needs to be implementable at a reasonable cost and in a reasonable time, and be auditable.

(e) The technique shall not ignore the tail risk in contracts with very skewed pay-offs, such as contracts that contain embedded options (eg the interest guarantees and other financial guarantees embedded in many life insurance products) or that cover low-frequency high-severity risks (such as earthquake), or portfolios that contain significant concentrations of risk. For example, if a large portfolio of insurance contracts is subject to significant earthquake risk but the insurer estimates that the probability of an earthquake is only 1 per cent, the approach should not ignore that risk.[4]

(f) The technique shall make it easy to provide concise and informative disclosure, and for users to benchmark the insurer's performance against the performance of other insurers.

(g) The technique shall not overlook model risk (the risk that a model is not a good description of the underlying process) or parameter risk (the risk that a model uses estimates of parameters that differ from the true parameters, or that the parameters may change over time).

A6. Caution is needed in making judgments under conditions of uncertainty, so that liabilities are not understated. However, uncertainty does not justify deliberate overstatement of liabilities. Care is needed to avoid duplicating adjustments for risk with consequent overstatement of the liability.

A7. Although the risk adjustment is included in the measurement as conceptually separate from the other building blocks (expected cash flows, discount rate), this is not intended to preclude 'replicating portfolio' approaches. A replicating portfolio is a portfolio of assets whose cash flows **exactly** match those contractual cash flows in amount, timing and uncertainty. If a replicating asset exists for all (or, more likely, some) of the cash flows, the insurer can include the fair value of these assets in the measurement of the insurance contract, instead of estimating the expected present value of those cash flows and determining an explicit risk adjustment for those cash flows. To avoid double counting, the risk adjustment does not include any risk that is captured in the replicating portfolio. Paragraphs [BXX-BXX of the draft guidance on estimating cash flows] provide further guidance on application of a replicating portfolio for the measurement of insurance contracts.

**Considerations used in selecting a risk adjustment technique**

A8. The following techniques for determining a risk adjustment are described below:

(a) confidence level (paragraphs A10-13)

(b) conditional tail expectation (paragraphs A14-A17)

(c) Cost of capital (paragraphs A18-A24)

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[4] The tail risk affects both (1) the expected cash flows and (2) the risk adjustment required for possible variations from the expected cash flows. Estimates of expected cash flows need to capture the effect that tail risk has on (1). The risk adjustment needs to capture the effect of tail risk on (2).

A9. Paragraphs A10-A24 provides some insight into the necessary considerations when choosing the appropriate risk adjustment technique.

**Confidence level**

A10. Rather than using a single amount (such as a mean), a *confidence interval* uses an interval within which the actual outcome is likely to fall at a specified *confidence level*. The *confidence level* provides the likelihood that the actual outcome will be included within the interval. The confidence level technique is sometimes referred to as Value at Risk (VaR). The International Actuarial Association's paper *Measurement of Liabilities for Insurance Contracts: Current Estimates and Risk Margins* provides a description of the use of confidence intervals in determining a risk adjustment stating:

> [Risk adjustment techniques] based on confidence levels express uncertainty in terms of the extra amount that must be added to the expected value so that the probability that the actual outcome will be less than the amount of the liability (including the risk margin) over the selected time period equals the target level of confidence.

A11. The use of *confidence intervals* for determining a risk adjustment has the benefits of being easy to communicate to users and of being relatively easy to calculate. However, the usefulness of confidence intervals diminishes when the distribution of losses is not normal (that is, the loss distribution is skewed which is often the case for insurance contracts). When the loss distribution is not normal (that is, the mean and median are not equal), the selection of the confidence interval must take into account additional factors such as the skewness of the loss distribution. In addition, this technique ignores outliers (extreme losses in the tail) in the loss distribution.

A12. For example, suppose a confidence level of 95% is used and the following estimates are made for two contracts. For contract A, the 95% confidence level is CU1,000 and the remaining 5% of the distribution is evenly spread from CU1,001 to 1,010. For contract B, the 95% confidence level is CU1,000 and the remaining 5% of the distribution is evenly spread from CU1,001 to 2,000. At the 95% confidence level, these two contracts will have the same risk margin. On the other hand, at say the 97% confidence level, contract A will be measured at CU1,004 and contract B will be measured at CU1,400.

A13. Judgement is required to determine what confidence level (ie what percentage) to set for particular portfolios of contracts in particular circumstances. In setting the confidence level, an insurer would consider factors such as the shape of the distribution, which may differ by portfolio. Because the distribution can change over time, the confidence level may need to be change accordingly in future periods.

**Conditional Tail Expectation**

A14. Conditional Tail Expectation (CTE) (also referred to a Tail Conditional Expectation and Tail value at risk) is an enhancement of value at risk. CTE provides a better reflection of the potentially extreme losses than value at risk by incorporating the expected value of those extreme losses in the measure of the

risk adjustment. The Society of Actuaries' paper *Analysis of Methods for Determining Margins for Uncertainty under a Principle-Based Framework for Life Insurance and Annuity Products* provides the following description:

> The CTE method is a modified percentile approach that combines the percentile and mean values of different cases. It basically calculates the mean of losses within a certain band (or tail) of pre-defined percentiles. With the CTE method, the margin is calculated as the probability weighted average of all scenarios in the chosen tail of the distribution less the mean estimate (which may or may not be the median, i.e. the 50$^{th}$ percentile). The CTE method is an improvement over the percentile (VaR) method discussed above since it smoothes some extreme claims (or statistical outliers).

A15. The key advantage of the CTE is that since it applies fundamentally the same calculation technique as the mean estimate, it has the benefit of consistency and it also reflects the skew of the distribution in the risk margin. For example, the CTE over the 75% confidence level (often referred to as CTE(75)) of a claim distribution is the expected value of all claims that fall into in the highest 25% of the claim distribution. The margin in this case would be taken as CTE (75) less the mean (i.e. best estimate) of claims.

A16. The focus of a CTE technique on the tail reflects a fundamental aspect of insurance—the fact that the tail is the riskiest part of the distribution . As part of the analysis of the amount an insurer would rationally pay, a significant amount of consideration would be given to the tail of the risk (that is, the loss distribution). Consequently, CTE techniques would meet the objective for a risk adjustment described in this paper. However, a confidence interval (such as value at risk) approach still may meet the objective if distributions are not particularly skewed.

A17. Judgement is required to determine what CTE band to set for particular portfolios of contracts in particular circumstances. In setting the confidence level, an insurer would consider factors such as the shape of the distribution. Because the distribution can change over time, the CTE band may need to be change accordingly in future periods.

***Cost of capital techniques***

A18. Cost of capital techniques are applied for a number of purposes, for example pricing insurance contracts, valuation of business combinations, regulatory reporting, internal capital management or supplementary reporting. However, for general purpose financial reporting, the purpose of using such techniques is to determine a risk adjustment that reflects uncertainty about the amount and timing of the future cash flows that will arise as the insurer fulfils its existing insurance contracts.

A19. In order to fulfil the contracts, the insurer needs to hold and maintain sufficient capital. If the insurer did not have sufficient capital, it might be unable to fulfil its obligations and policyholders are likely to surrender their contracts.

A20. Like the other two techniques, a cost of capital technique starts by estimating the distribution for the expected claims. It then picks out a point on the distribution that provides a high degree of certainty that the insurer will be able to fulfil its obligations under existing insurance contracts. However, it does not use that point on the distribution directly, but instead uses it to determine the required capital. The insurer then determines the risk adjustment by applying a factor, in the form of an appropriate annual rate, to the required capital (sometimes described as the economic capital) over the lifetime of the contract.

A21. For example, suppose an insurer sets the required capital as the amount necessary to provide for a confidence level of 99.5%, and determines that the required capital is CU100. Suppose also that the insurer determines that the appropriate capital rate is 8% per annum, and that it will need to hold the required capital for one year. Therefore, the cost of the required capital will be CU8 (CU100 at 8% for one year) and this is the amount f the risk adjustment.

A22. In order to reflect the overall objective for the risk adjustment and the characteristics and factors described in paragraphs A4 and A5, both capital and capital rate need to be determined in an appropriate way:

(a) the capital should be an economic capital supporting the risks in the liability based on the distribution at a portfolio level, set at a level high enough to, for example, identify how much uncertainty exists in the tail of the distribution.

(b) the capital rate should reflect only those elements that are relevant to the liability by reflecting the reward the owners of the insurer would require for exposure to the risk in the liability, but not including asset risk, mismatch risk or those risks that are already captured elsewhere in the model by using financial market inputs. For example, suppose investors require a return of 18% for investing in an insurer, but 2% of that relates to asset risks born by the insurer, 1% relates to avoidable asset/liability mismatch risk taken by the insurer and 3% relates to uncertainty about future business (including operational risk related to future business). Assuming a risk free rate of 4%, the capital rate used in the cost of capital approach would be 8%. The risk free rate is also excluded because that return is not related to the insurance liability; it is a return that an investor would generate by investing in risk-free assets instead of investing in the insurer.

A23. Because the confidence level for determining the economic capital is set at a level that covers almost all possible outcomes, the cost of capital technique reflects almost the entire distribution. Only a relatively small band on the far end of the distribution, beyond the selected confidence level for economic capital, would not be covered. Therefore, in setting the confidence level, the insurer takes into account the possibility of low-frequency high-severity losses in the highest percentiles of the distribution. Because the cost of capital technique considers the run-off of the economic capital over the life of the contract, it also reflects how the risk varies over time.

A24. The confidence level for economic capital, and the capital rate applied as a factor to the required capital to calculate the risk adjustment, should be set in a

way that reflects the characteristics of the liability at each point in time. Conceptually, it would be possible to apply different confidence intervals, and different capital rates, to different types of contracts. But because the required capital is set in a way that reflects the tail risks, it may be possible to apply a consistent confidence level, and capital rate, to different portfolios and over time.

***Comparison of techniques with the characteristics of a risk adjustment***

A25. Paragraph A4 gives the characteristics that a risk adjustment must have to satisfy the objective stated in paragraph A1. All three techniques permitted by this [draft] [IFRS] [Standard] may meet those characteristics in at least some situations, but not necessarily all, and in varying degrees depending on the circumstances. The following paragraphs discuss when each of these techniques is more likely to be appropriate.

A26. Paragraph A4(a) states that risks with low frequency and high severity will have higher risk adjustments than risks with high frequency and low severity. In other words, risk adjustments will be larger for probability distributions that are more skewed. Because confidence level techniques focus on one point in the probability distribution, they do not satisfy this criterion. Therefore, confidence level techniques are not appropriate for distributions that highly skewed. CTE techniques can satisfy this criterion, even for skewed distributions, because they consider all outcomes above the confidence level. Similarly, cost of capital techniques can satisfy this criterion, even for skewed distributions, if the required capital is set at a sufficiently high level that it captures most of the tail of the distribution.

A27. Paragraph A4(b)states that, for similar risks, long duration contracts will have higher risk adjustments than those of shorter duration. The confidence level and CTE techniques achieve this to the extent that the insurer's estimate of the distribution of outcomes takes account of this factor. Cost of capital techniques achieve this in a way that explicitly reflects the changing shape of the distribution over time by applying a capital factor (rate) to the capital required over each period during the life of the contract.

A28. Paragraph A4(c)states that risks with a wide probability distribution will have higher risk adjustments than those risks with a narrower distribution. The confidence level achieves this if the additional width occurs below the selected confidence level. The CTE technique achieves this because it considers the entire tail. Cost of capital techniques consider this so long as the widening does not occur further out in the tail of the distribution than confidence level used to determine the required capital.

A29. Paragraph A4(d) states that the less that is known about the current estimate and its trend, the higher the risk adjustment shall be. The confidence level and CTE techniques could consider this factor by, for example, setting a higher

confidence level. A cost of capital technique could consider it by, for example, increasing the confidence level used to determine the required capital.

A30. Thus, in summary, when the distribution is not skewed and does not vary significantly over time, a confidence level approach can typically provide a risk adjustment that satisfies the objective set out in paragraph A1 and meets the characteristics described in paragraph A4. However, when the distribution of possible outcome is skewed or varies significantly over time, a conditional tail expectation or cost of capital technique is more appropriate, because those approaches result in a risk adjustment that is likely to be more sensitive to the shape of the risk (the distribution of possible outcomes around the mean) and to changes in its shape over time.

[**The following two paragraphs would be included in the disclosure section but have been included to assist with understanding the approach to a risk adjustment.]**

A31. The insurer shall disclose the confidence level at which it determined its risk adjustment. If the insurer uses a Conditional Tail Expectation approach or a Cost of Capital approach, it shall disclose the confidence level to which the risk adjustment determined under those methods corresponds (for example, that the risk adjustment of CUX determined at Conditional Tail Expectation (Y) corresponds to a confidence level of Z%). The insurer shall disclose this information in addition to specific disclosures about the Conditional Tail Expectation technique or a Cost of Capital technique. This information gives a common benchmark for disclosure that is also easy to communicate to users.

A32. For any technique, an insurer shall disclose its characteristics (eg actuarial and statistical) and management's rationale for the specific technique selected.