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Project **Insurance Contracts**

Topic **Level of measurement**

Purpose of this paper

1. At their January joint meeting, the boards tentatively decided that the building block approach should be applied to measure the combination of rights and obligations arising from an insurance contract. This paper deals with the level of aggregation that an insurer should take into account for measurement purposes.

Summary of staff recommendations

2. In this paper staff recommend that:

   (a) the forthcoming exposure draft on Insurance Contracts keep the portfolio notion currently in IFRS 4, ie "Contracts that are subject to broadly similar risks and managed together as a single portfolio";

   (b) if the measurement includes a separate risk adjustment, that adjustment should be determined for a portfolio of insurance contracts. Therefore, the risk adjustment would not reflect the effects of diversification between portfolios and negative correlation between portfolios; and

   (c) the residual margins and composite margins are determined, both initially and subsequently, at a cohort level that groups insurance contracts:

      (i) by portfolio (as defined above in accordance with IFRS 4);

(ii) within the same portfolio, by date of inception of the contract; and

(iii) by length (or life) of the contract.

Background

3. The issue discussed in this paper can be summarised in the following question: *Should insurance contracts be measured individually or at some higher level of aggregation?* In this paper, we use the term "level of measurement" to describe this issue. First of all, this question needs to be answered by distinguishing recognition and measurement aspects.

Recognition

4. Because aggregating contracts does not create any new or different contractual rights and obligations and it does not eliminate existing contractual rights and obligations, for recognition purposes insurance contracts should be accounted for at the individual contract level. Therefore, the level of aggregation is not relevant to recognition.

Measurement

5. The boards have tentatively decided that a measurement model for insurance contracts should be based on the following building blocks:

   (a) the unbiased, probability-weighted average of future cash flows expected to arise as the insurer fulfills the contract;

   (b) the time value of money; and

   (c) a margin (in FASB's tentative view, a composite margin; in IASB's tentative view, a risk adjustment plus a residual margin).

6. In principle, the forthcoming exposure draft can be thought of as dealing with (recognition and) measurement of an insurance contract. In practice, insurance contracts are issued and managed together, based on the similarities and dissimilarities of the risks which insurers provide coverage from (this is further explained in paragraph 13). Also, from a cost-benefit perspective, practical difficulties may exist in measuring insurance contracts on an individual contract basis due to the large amount of contracts insurers normally issue. Therefore, staff have identified three levels to consider for measuring insurance contracts:

(a) portfolio level;

(b) entity-wide level;

(c) group-of-entities level.

7. The rest of the paper discusses the following aspects of the level of measurement :

   (a) Estimates of cash flows (paragraphs 8-11)

   (b) Risk adjustment (paragraphs 12-37)

      i. Risk mitigation and diversifiable risk (paragraphs 13-17)

      ii. Determination of the risk adjustment: Should a risk adjustment reflect diversifiable risk? (paragraphs 18-30)

      iii. Staff Analysis and Recommendations on the risk adjustment (paragraphs 31-37)

   (c) Residual and composite margins (paragraphs 38-48)

      i. Staff Analysis and Recommendations on residual and composite margins (paragraphs 45-48).

Estimates of cash flows

8. In principle, the expected (probability-weighted) cash flows from a portfolio equal the sum of the expected cash flows of the individual contracts. Therefore, the level of measurement does not affect the expected present values of future cash flows.

9. From a practical point of view, it is easier to perform some types of estimate in aggregate for a portfolio, rather than for individual contracts. For example, IBNR (incurred but not reported) estimates are typically made in aggregate. However, in substance, this is no different from making expected value estimates for individual contracts and aggregating the results.

10. Thus, in principle, the level of measurement does not affect the expected cash flows, provided that estimates of cash flows reflect all relevant inputs. Some of those inputs might be derived by contract (eg estimates of the possible outcomes of a single claim) and others might be derived in aggregate (eg IBNR).

11. If the level of measurement is the contract, some might argue that estimated cash flows should exclude expenses that are not incremental. Incremental expenses are expenses that the insurer will incur because of a particular contract and that it would have avoided if it did not have that contract. However, excluding all non-incremental expenses from the measurement would not be consistent with looking at fulfilment of the contract. The insurer would consider all expenses that directly relate to fulfilling the contract, regardless of whether those expenses are incremental. We intend to address in more detail what costs would directly relate to fulfilling a contract as part of drafting and, when necessary, bring it back to the boards.

Risk adjustment

12. One of the approaches to margins includes a separate risk adjustment together with a residual margin that eliminates the day-one difference.

Risk mitigation and diversifiable risk

13. As an inherent characteristic of insurance business, risk is managed at an aggregated level in order to mitigate it via three main *risk mitigation techniques*:

    (a) Pooling of risks – (assembling a balanced portfolio of reasonably homogeneous risks to permit reasonable estimates of the behaviour of the pool as a whole). For example, a life insurer might assemble a portfolio of policyholders who are believed to have similar mortality characteristics. In doing this, the insurer will consider the trade-off between (i) the need to have a large pool, both to minimise random fluctuations in claims and to generate more reliable statistical information and (ii) the need to subdivide the population into smaller pools with more uniform risk characteristics (eg by age, sex, occupation, smoker status or location). (We note that some other financial institutions also pull risks together in this way. For example, banks assemble portfolios of a large number of loans in order to reduce the uncertainty of credit losses.)

    (b) Diversification of risks – (collecting different risks generating random fluctuations that tend, on average, to cancel each other out). For example, a multi-line insurer diversifies risk by selling many different types of insurance, although that diversification is less effective if the results of the different types are correlated.

Similarly, by investing in a large number of entities, a mutual fund reduces the risk of large fluctuations caused by factors specific to a particular investee, but does not reduce the risks that are common to all investees (eg business cycle or interest rates).

(c) Offsetting of risks – (collecting risks that are negatively correlated so that adverse outcomes for one item tend to be offset by favourable outcomes for other items). For example, term life insurance exposes the insurer to the risk that policyholders will die prematurely, whereas annuities expose the insurer to the risk of unexpected longevity. An insurer issuing both types of contract is likely to suffer less fluctuation in total claims than an insurer that issues only one type of contract.

14. These techniques aim to reduce the overall risk borne by the insurer so that, in effect, the insurer requires a reward only for the component of risk that is not diversifiable by the insurer (what remains after consideration of pooling and diversification benefits). The level of measurement will determine the extent to which any risk adjustment would catch the variability and random fluctuations that risk mitigation techniques have not been able to reduce or hedge otherwise. Theoretically the higher the level of measurement the better the possibility to capture most diversification and offsetting effects.

15. Standard finance theory argues that a risk adjustment should not be made for risk that is diversifiable by market participants. Brealey-Myers in their *Principles of Corporate Finance* (1996) express this concept by saying that: "*The risk of a well-diversified portfolio depends on the market risk of the securities included in the portfolio.* Tattoo that statement on your forehead if you can't remember it any other way". This means that risk other than non-diversifiable risk is not rewarded by markets. In this same respect, it has also been pointed out that: "A basic textbook assumption when pricing insurance is that mortality risk is completely diversifiable and therefore not priced by capital markets in economic equilibrium. Under this traditional paradigm, the law of large numbers (LLN) is invoked to argue that the standard deviation per policy (SDP) vanishes in the limit. Therefore, a large enough insurance company portfolio is sufficient to eliminate mortality risk from the pricing and valuation equations." (Milevsky et a. 2006).

16. Thus conceptually, according to the theory, a generic investor would not expect a reward for the diversifiable risk just because it would be able to fully diversify its portfolio of investments.

17. However, the absolute absence of any rewards for diversifiable holds under some strict and particular circumstances that, arguably, are not always observed in practice for the insurance business. Some typically argue that both diversifiable and non-diversifiable risks can observed in practice and are relevant, on the following grounds:

    (a) CAPM (capital asset pricing model) and similar models are based on idealised assumptions, such as a perfect and liquid market, rational behaviour by investors, minimal transaction costs and the existence of arbitrage traders whose activities will force market prices to converge to levels that eliminate arbitrage opportunities. Arguably, these assumptions do not apply in most insurance markets.

    (b) Because there is a cost to obtaining information, risks that are diversifiable in theory, may not be fully diversifiable in practice.

    (c) Reinsurers sometimes charge lower premiums than a direct insurer for the same exposure. One reason for such differences may be that the reinsurer is diversifying the exposure more broadly. Some see that as evidence that insurers' pricing models include diversifiable risk.

    (d) It seems likely that some of the techniques for determining risk margins will not be able to exclude the effect of diversifiable risks. For example, consider quantile techniques. To apply a quantile effect excluding the effect of diversifiable risk, it would be necessary to generate a distribution of outcomes that considers only non-diversifiable risks. That may not be feasible. In addition, if such a distribution could be generated, it would be different from the distribution needed to generate the expected value of the cash flows. (This is because textbook financial theories exclude diversifiable risk in determining **risk adjustments**. They do **not** exclude them in determining **expected values**). The result is likely to be confusing and may lack relevance.

Determination of the risk adjustment: Should risk adjustments reflect diversifiable risk?

18. Diversification effects are observed at a single portfolio level from pooling, but they may also arise across portfolios from diversification between portfolios and negative correlations between portfolios.

19. Considering the analysis of risk mitigation and diversification, the following key question arises: *what is the appropriate level of aggregation that allows for benefiting from the effects of risk mitigation techniques, thus reducing (or potentially eliminating) the chances (and the impact) that risk that is otherwise diversifiable might be embedded in the risk adjustment?* In order to answer this question, the risk mitigation techniques are analysed separately below.

Risk mitigation within a portfolio

20. As mentioned in paragraph 13(a), pooling of risks reduces the random fluctuation around the expected value of a portfolio of similar contracts. Consequently, a risk margin will be lower if it is determined for a portfolio that pools together similar risks than if it is determined for each contract and then aggregated. Therefore, by definition, for a risk adjustment to reflect the pooling of risks, the lowest level of aggregation to consider is the one that allows the aggregation of as many similar contracts as it is possible and, in any case, at a level which is no lower than the actual pool identified by the insurer.

21. The portfolio level may prove to be a valid level of measurement in order to capture pooling of risks effects. Particularly, the current definition in IFRS 4 of a portfolio of contracts (also repeated in the DP *Preliminary views on Insurance Contracts*) may help in identifying this level of aggregation by similar contracts. It is as follows:

> Contracts that are subject to broadly similar risks and managed together as a single portfolio.

22. This definition presents two criteria that characterize a portfolio of insurance contracts:

    (a) similarity of risks;

    (b) common management approach.

23. Regarding (a), respondents to the DP considered that by catching this factor the definition appropriately portrays the fundamentals of insurance business.

24. In respect of (b), rather than being a criterion *per se,* whether contracts giving rise to similar risks are managed together is a matter of fact: pricing of contracts that are subject to similar risks is performed on an aggregated basis; risk management tools, such as hedging techniques, are chosen by type of risk.

25. As an example of *intra-portfolio* diversification, consider for example an insurer that has a portfolio of motor insurance contracts in North America and household insurance in Asia.

Risk mitigation across portfolios

26. While the focus of pooling of risks is on similarity between risks, diversification effects between portfolios and negative correlation between portfolios may also arise where dissimilar risks are pulled together. Potentially, the larger the pool of insurance contracts the higher the possibilities to capture diversification effects. This means that conceptually diversification effects may be best appreciated at entity level or even at a higher level of aggregation, such as at a group level.

27. An interesting practical example of diversification between portfolios is a catastrophe swap. For example, sometimes an insurer with significant exposure to Japanese earthquake risk may swap part of that risk for part of another insurer's North American earthquake risk. By doing so, both insurers increase the likely frequency of claims, but reduce their maximum loss.

28. We can illustrate negative correlation between portfolios by considering an extreme example. Suppose two risk positions offset exactly, for all outcomes of the distribution. Then the combined risk position will have no variability and so no risk adjustment would be required for the net position (except, perhaps, for any residual credit risk that remains).

29. Some respondents to the DP were in favour of recognising the effects of diversification across portfolios especially when risks are managed together or when it is necessary to reflect the economic reality to the extent that an insurer benefits from diversification. Also some respondents suggested taking into account diversification effects at the highest level of consolidation (group-level).

30. Other respondents to the DP argued that taking into account diversification effects would be practically difficult and would lead to a high degree of subjectivity; also respondents developed considerations in the context of an exit value notion and argued that the smallest tradable unit is usually the portfolio of contracts.

Staff Analysis and Recommendations on risk adjustments

31. At the March Joint meeting the IASB tentatively decided that the objective for the risk adjustment is to measure:

> the amount, if any, that the entity would rationally pay in excess of the expected present value of the outflows to be relieved of this risk.

32. Insurers put risk mitigation techniques in place in order to manage the risk, for example by diversifying it. If a risk adjustment is to represent the amount an entity would rationally pay to be relieved of the risk, the insurer would take into account efforts to mitigate risk and should **at least** consider **some** effects of pooling and diversification. Furthermore, it may be impractical or unnecessarily burdensome to determine the risk adjustment at the level of individual contract. Therefore the issue is, in our view, whether to consider pooling of risks at the single portfolio level or also diversification beyond the portfolio level.

33. Arguably, diversification benefits between portfolios should be taken into account when estimating the risk adjustment under a fulfilment notion because it would reflect the "lowest amount an entity would rationally pay to be relieved of the risk of fulfilling the (remaining) obligation". It may also be more consistent with an insurer's pricing practices and provide users with information about the extent to which the insurer has mitigated risk at the entity level.

34. However, although theoretically appealing, the idea of setting a level of measurement that requires to capture all diversification and offsetting effects arising at a cross-portfolio level (eg entity level or group of entities level) has the following issues:

    (a) it may generate practical difficulties if capital is not fully fungible. If capital is not fully fungible across the entity[1] (or the group of entities), it may be difficult, and perhaps impossible, to use surplus capital in one portfolio to cover a shortfall in another portfolio This may reduce, or perhaps eliminate, the benefit of diversification between those portfolios;

    (b) it requires the need for a reliable basis that enables the insurer to determine the diversification benefits beyond portfolio level in a sufficiently robust and objective way. Also considering the issues mentioned under (a), such a basis may not be available;

    (c) if information on the risk margin is needed at a lower level of aggregation than the entity (or group-of-entities) level (eg for a segment), using such a high level of measurement will require allocations down to lower levels; this allocation may be difficult in some cases.

[1] Capital may not be fungible across an entity if the entity contains separate ring-fenced funds.

35. Although staff acknowledges some of the conceptual thinking behind diversification (paragraph 33), staff conclude, for the reasons in paragraph 34, that risk margins should be determined for portfolios and should not take into account diversification effects beyond portfolio. In addition, staff see no reason why a risk adjustment determined at a portfolio level would necessarily be inconsistent with a fulfilment notion.

36. IFRS 4 included the definition of a portfolio of insurance contracts as "Contracts that are subject to broadly similar risks and managed together as a single portfolio". Staff conclude that, because of its reference to similarity of risks and common management criteria, this definition provides a useful basis for capturing both these effects which are largely regarded as basic aspects of insurance business. Staff did not see an obvious way to improve that definition.

37. Therefore staff recommend that:

    (a) if measurement includes a separate risk adjustment, that adjustment should determined for a portfolio of insurance contracts. Therefore, the risk adjustment would not reflect the effects of diversification between portfolios and negative correlation between portfolios; and

    (b) the current definition of a portfolio of insurance contracts in IFRS 4 be retained for an exposure draft, ie "Contracts that are subject to broadly similar risks and managed together as a single portfolio".

Question 1
Do the boards agree with the staff's recommendation in paragraph 37 (a)? Do the boards agree with the staff's recommendation in paragraph 37 (b)?

Residual and composite margins

38. Both residual and composite margins share the characteristic of being the result of a *calibration exercise* rather than deriving from a direct measurement. They are, in particular, 'residual quantities' that need to be run off according to a pre-defined driver (or set of drivers). Because of these common characteristics, we analyse them below together.

39. Two conceptually separate, but practically connected issues in respect of the level of measurement are relevant for both residual and composite margins:

    (a) How may the level of measurement deal with the run off of these margins?

(b) What is the appropriate level of aggregation to recognise any day one losses that arise?

40. Theoretically, at least two variables can be taken into account for the run off of the residual and composite margin: risk and time. While for the residual margin the risk factor is already dealt with via the risk adjustment, for the composite margin, the risk component would be embedded in the margin itself and therefore it may deserve consideration in the choice of the drivers for the run off.

41. A time component may form part of the run-off pattern because the calibration exercise that gives rise to residual and composite margins is performed at a certain point in time (ie the date of inception) and reflects circumstances at that time. The residual or composite margins ought to reduce over time in line with changes in some or all of those circumstances.

42. In order to take into account the time variable in the run off pattern of residual and composite margin, contracts having the same inception dates and subject, across time, to similar circumstances should be grouped together. It is reasonable to expect that contracts belonging to a same portfolio, because they share similar characteristics in respect to the insurance risk and are managed together, will be subject over time to similar circumstances. Also, the similarity of circumstances will depend on the length of the contract, therefore within the same portfolio, contracts should be grouped that have same length (or life).

43. In summary, for the purpose of defining an adequate level of measurement for the residual and composite margin, insurance contracts may be grouped:

(a) by portfolio (as defined above in accordance with IFRS 4);

(b) within the same portfolio, by date of inception of the contract; and

(c) by length (or life) of the contract.

A level of measurement for the residual and composite margin that breaks down each portfolio of contracts according to the time variable as suggested above, may be indicated as a *cohort* of contracts-level. If the measurement includes a separate risk adjustment, the insurer needs to identify the part of the risk adjustment that relates to each new cohort in order to determine the residual margin at inception for those cohorts. Subsequently, there is no need to identify the risk adjustment for a cohort because the risk adjustment and residual margin have no further connection after inception.

44. Of course the lowest level of measurement for the residual and composite margins would be the single contract level which would allow for tracking of losses and profitability arising from each individual contract. However, tracking residual and composite margins at a single contract level would be impracticable.

Staff analysis and recommendations on residual and composite margins

45. Staff notices that, because they result from a calibration performed at the date of inception and are subject to a release over time, for both the residual and composite margins the 'time' variable should be the basis for the definition of the level of measurement.

46. In particular, staff believe that for the purpose of measuring residual and composite margins, insurance contracts should be aggregated:

    (a) by same date of inception; and

    (b) by a criterion that reasonably ensures that across time contracts are subject to similar circumstances and that therefore are run off in a broadly similar way.

47. Staff think that the current portfolio notion in IFRS 4 will have the result that, to a reasonable extent, insurance contracts are subject to similar circumstances because it requires that contracts be grouped when subject to similar risks and managed together. In staff's view those criteria are consistent with the expectation that a portfolio of insurance contracts is subject to similar circumstances over time. Also in order to be subject to similar circumstances over time contracts should have same length or life.

48. Therefore staff recommend that the boards require residual margins and composite margins to be determined, both initially and subsequently, at a cohort level that groups insurance contracts:

    (a) by portfolio (as defined above in accordance with IFRS 4);

    (b) within the same portfolio, by date of inception of the contract; and

    (c) by length (or life) of the contract.

Question 2
Do the boards agree with the staff's recommendation?