

STAFF PAPER

25 May 2015

Emerging Economies Group meeting

Project	Present value measurements research		
Paper topic	Further research and next steps		
CONTACT(S)	Aida Vatrenjak	avatrenjak@ifrs.org	+44 (0)20 7246 6456
	Wayne Upton	wupton@ifrs.org	

This paper has been prepared by staff of the IFRS Foundation. The views expressed in this paper reflect the individual views of the author[s] and not those of the IASB or the IFRS Foundation. Comments on the application of IFRSs do not purport to set out acceptable or unacceptable application of IFRSs.

Introduction

1. The next steps in the IASB research on present value measurements include:
 - (a) finalise the summary of findings on present value components and methodology;
 - (b) discuss the research project findings with the IASB and Accounting Standards Advisory Forum in July 2015; and
 - (c) the IASB to decide on the way forward.
2. When scoping this project in 2014, the IASB had tentatively decided to publish a Research paper summarising its findings. It is currently tentatively planned for the research paper to be published in Q3 2015.
3. This paper discusses those next steps. It includes a long section on potential issues to be considered with respect to the components and methodology of present value measurement, which we are researching further. At the end of the paper we have included brief discussion on the way forward.
4. Appendix 3 includes a contents list for this paper.
5. **It is important to note that this paper in particular, and the other papers discussed at the meeting, are work in progress, and should not be read as final findings from the research project.**

6. In this paper we ask the EEG members the following questions:

Components and methodology

7. Question 4: Is there sufficient guidance available in emerging economies to enable the elements of the present value calculation (eg future cash flows) to be determined? (In practice, are the calculations typically performed by accountants, or by valuation professionals?)

8. Question 5: Is the data required for present value measurement readily available in your jurisdiction, and if so is it consistently used? For example, are there any issues in determining whether there is a deep market in high-quality bonds in order to apply IAS 19 Employee Benefits, or finding a pre-tax rate for the value in use calculations in IAS 36 Impairment of Assets, or determining risk-free rate?

9. Question 6: Is the method of present value measurement generally understood, and consistently applied? Are there economic factors in your jurisdiction not commonly found outside emerging economies that may have an effect on how present value measurement is applied (eg inflation, market liquidity)? Do the benefits of present value measurement justify the costs of applying it in emerging economies?

The way forward

10. Question 7: What should the IASB do about the identified differences and issues in the application of present value measurement?

11. Question 8 What effects, if any, would there be for emerging economies if the IASB decided to address some of the issues; eg via:

- (a) smaller projects on particular aspects? One example may be a project consider whether and how to include risk and liquidity adjustments in all present value measurements that require current values?
- (b) larger, cross-cutting project on present value measurement (similar to IFRS 13 Fair Value Measurement) setting a consistent methodology for present value measurement?, and/or
- (c) education or other material?

Further research—Components and methodology

12. This section of the paper outlines further research in two areas:
 - (a) Components of present value measurement included in different measurements requiring use of the current present value measurements (direct measurements).
 - (b) Methods used to arrive at the measurements.
13. These two areas are discussed in the paper in the context of direct measurements, ie measurements for which IFRS requires use of present value measurements, using current inputs. This includes IAS 19 *Employee Benefits*, IAS 36 *Impairment of Assets* and IAS 37 *Provisions, Contingent Liabilities and Contingent Assets*, as well as insurance contracts. We also make reference to IFRS 13 *Fair Value Measurement*.

Present value measurement components

14. Present value measurement requires two main inputs: an estimate of future cash flows, including their amount, timing and variability, and an estimate of a discount rate consistent with those cash flows.
15. As we have noted in Agenda Paper 1A, *any* combination of cash flow estimates and a discount rate can be used to arrive at a present value. The questions to be answered are what is the *objective* of the measurement and what are the *components* of the estimates. We have discussed objectives in Agenda Paper 1A and are now discussing measurement components.
16. IAS 36 (for value in use) and IFRS 13 (for fair value) describe the components of present value measurement in most detail (compared to other Standards), listing factors a market participant would consider when valuing an asset or a liability. This description includes:
 - (a) an estimate of the future cash flow(s);
 - (b) expectations about possible variations in the amount or timing of those cash flows;

- (c) the time value of money, represented by the current market risk-free rate of interest;
 - (d) the price for bearing the uncertainty inherent in the asset;
 - (e) other, sometimes unidentifiable, factors (such as illiquidity) that market participants would take into account; and
 - (f) for a liability, the non-performance risk relating to that liability, including the entity's (ie the obligor's) own credit risk.
17. Our review uses this list as a reference and discusses each of the components individually and whether and how they are included in various present value measurements.
18. IAS 36 *Impairment of Assets* and IFRS 13 *Fair Value Measurement* require all of these risks and factors to be considered in measurement. However, their resulting measurement is different, because IAS 36 requires an entity-specific current value when determining value in use and the fair value is a market-specific current value, as discussed in Agenda Paper 1A on measurement objectives.
19. Given this, we first consider an entity-specific versus a market-specific measurement perspective. We then discuss each of the individual components of present value measurement and in which present value measurements they are included.

Entity versus market perspective

20. As already stated, fair value is a market-specific measurement whereas other measurements are entity-specific.
21. IAS 36 requires that the cash flows included in the measurement of the value in use are considered from an entity perspective, ie using information from the management forecasts, reflecting the entity's planned use of the asset. On the other hand, fair value considers cash flows from market perspective, reflecting market expectations. Consequently, the resulting measurement of the value in use can be different from the fair value, even though the two measurements take into consideration the same components listed in paragraph 3.

22. However, even though value in use is an entity-specific measurement, the discount rates required by IAS 36 is the same rate as the one used in fair value measurement, ie a market-based rate.

23. The IASB explains this apparent anomaly in paragraph BCZ 54 of IAS 36:

In principle, value in use should be an enterprise-specific measure determined in accordance with the enterprise’s own view of the best use of that asset. Logically, the discount rate should be based on the enterprise’s own assessment both of the time value of money and of the risks specific to the future cash flows from the asset. However, IASB believed that such a rate could not be verified objectively. Therefore, IAS 36 requires that the enterprise should make its own estimate of future cash flows but that the discount rate should reflect, as far as possible, the market’s assessment of the time value of money. Similarly, the discount rate should reflect the premium that the market would require from uncertain future cash flows based on the distribution estimated by the enterprise.

24. The following table summarises the use of entity vs market perspective in the present value measurements.

Standard /Project	Item measured	Measurement attribute	Cash flow perspective	Rate perspective
IFRS 13	Assets and liabilities at fair value	Fair value	market	market
IAS 36	Non-financial assets (impairment)	Value in use	entity	market
Insurance Contracts	Insurance liability	Present value of amount to fulfil	entity (consistent with market)	entity for risk ¹ , market for the rest
IAS 37	Provisions	The amount to settle or transfer	entity (implicit)	market

¹ The risk adjustment in insurance contracts is a separate component. It is not included as a part of the rate.

Standard /Project	Item measured	Measurement attribute	Cash flow perspective	Rate perspective
IAS 19	Defined benefit plan obligation	Present value of ultimate cost	entity	market

Table 1 Entity versus market perspective²

25. Some discount rate components are considered from the market perspective in all existing entity-specific present value measurements; for example the time value of money is always represented by market assessment of the rate. Other components are not so clear cut. For example, risk premium is considered from a market perspective in IAS 36 and possibly also in IAS 37 (if it is included in IAS 37 measurement at all; see discussion in the section on risk premium below). On the other hand, the proposed Insurance Standard includes a separate measurement for risk adjustment, which would be determined from the entity perspective.

26. These differences can be explained by the fact that insurance contract measurement is based on the price charged to the customer which reflects the insurance company’s (entity’s) view of the risk—it therefore makes sense that the liability measurement also reflects entity’s view of the risk.

27. But, in practice, how different is entity perspective from market perspective? Sometimes they could be the same, as indicated in the *Conceptual Framework* project discussion:

If an entity is estimating the value of a specialised item, there may sometimes be little reason for the entity to assume that market participants would use assumptions different from those the entity itself uses. In that case, measurement from a market participant perspective and measurement from the entity’s perspective are likely to produce similar measures.

28. When present value measurement is required to determine fair value, it usually means that all appropriate observable market inputs are not available and unobservable

² Some components of the present value measurement, such as risk premium, can be included either in the rate or the cash flows—this is discussed in the methodology section below. For the purpose of the table, they are assumed to be in the rate.

inputs may be needed, including some of entity's own estimates. Paragraph 89 of IFRS 13 says:

An entity shall develop unobservable inputs using the best information available in the circumstances, which might include the entity's own data. In developing unobservable inputs, an entity may begin with its own data, but it shall adjust those data if reasonably available information indicates that other market participants would use different data or there is something particular to the entity that is not available to other market participants (eg an entity-specific synergy).

29. IAS 36 goes on to specify how entity-specific value may be different to market value:

For example, fair value does not reflect any of the following factors to the extent that they would not be generally available to market participants:

- (a) additional value derived from the grouping of assets (such as the creation of a portfolio of investment properties in different locations);
- (b) synergies between the asset being measured and other assets;
- (c) legal rights or legal restrictions that are specific only to the current owner of the asset; and
- (d) tax benefits or tax burdens that are specific to the current owner of the asset.

Potential issues to be considered

30. Table 1, which shows that, in entity-specific direct measurements, cash flows are determined from an entity perspective, while some or all components of discount rate are determined from a market perspective, could be misleading. This is because some components of measurement, eg tax or risk, could be included in either the rate or the cash flows. IAS 36, for example, says that the rate should be determined from a market perspective and that tax should be included in the rate (the Standard requires use of a pre-tax rate—for more on this see section on taxes below). However, the Standard also implies that entity-specific tax benefits should be taken into account (see quote in bullet (d) in previous paragraph). Consequently, it is not entirely clear

whether the market rate to be used in measurement reflects tax benefit specific to the entity.

31. We will do further research on implications of using entity vs market perspective and what differences there are between the two perspective in the practice.

Individual components of present value measurement

32. The following table shows which components of the present value measurement are included in different Standards that require the use of current present values (direct measurements).

IFRS/ Project	Item measured	Measurement description	Central estimate of cash flows	Time value of money	Risk premium	Liquidity premium	Own non- performance risk
IFRS 13	Assets and liabilities at fair value	Fair value	Yes	Yes	Yes	Yes	Yes
IAS 36	Non-financial assets (impairment)	Value in use	Yes	Yes	Yes	Yes	n/a
Insurance	Insurance contract	Present value of net cash flows expected to fulfil	Yes	Yes	Yes (separate)	Yes	No
IAS 37	Provisions	The amount to settle or transfer	Yes	Yes	Implicit	Not explicit	Not explicit (in practice no)
IAS 19	Defined benefit plan obligation	Present value of ultimate cost	Yes	Yes	No	Some	Some

Table 2 Components of present value measurement in various Standards

33. The following sections discuss each of the components, starting with the estimate of future cash flows.

Estimate of cash flows

34. Estimating cash flows involves determining:
- (a) what the future cash flows would be;
 - (b) when those future cash flows would occur; and
 - (c) the probabilities of different scenarios occurring, with respect to both amount and timing.
35. Other decisions are also needed, for example how to reflect variations in future cash flows, and whether cash flows estimates should include profit. These are discussed in the following sections.

Possible variations in estimated amount and timing of cash flows

36. The following are extracts from the discussion included in the ballot draft of the Framework ED, explaining the different central estimates of future cash flows:
- A1 Uncertainties about the amount of any cash flows are important characteristics of assets and liabilities. When measuring an asset or liability by reference to uncertain future cash flows, it is necessary to represent the range of possible cash flows by selecting a single amount. The most relevant amount is usually one from the centre of the range (a central estimate).
- A2 Different central estimates provide different information. For example:
- (a) Expected values (probability-weighted averages or mean values) reflect the entire range of outcomes, and give more weight to the outcomes that are more likely. They are not intended to predict the ultimate inflow or outflow of cash (or other economic benefits) arising from that asset or liability.
 - (b) Measurements based on the maximum amount that is more likely than not to occur (similar to the statistical median) indicate that the probability of a subsequent loss is no more than 50 per cent and that the probability of a subsequent gain is no more than 50 per cent.
 - (c) Measurements based on the most likely outcome (the statistical mode) predict the ultimate inflow or outflow arising from an asset or liability, instead of estimating a value of that asset or liability at the measurement date.

- A3 A central estimate (nb: based on cash flows and probabilities that are not adjusted for risk) does not capture the price for bearing the uncertainty that the ultimate outcome may differ from that central estimate.
- A4 No one central estimate gives complete information about the range of possible outcomes. To provide complete information, disclosure may be needed.

Profit margin

37. Another question when determining cash flows to include in the present value measurement is whether a profit margin should be added to the central estimate of future cash flows. To some, it may not make sense to include required profit in the estimate of the cash flows in calculating the cost of fulfilling the liability, because they believe that an entity should not report that it has earned profit on fulfilling its obligations. However, it may make sense to include profit in the measurement of the amount payable to transfer the obligation, because no party would be prepared to take on the liability without receiving consideration sufficient to compensate it for the activity required to fulfil the liability and for any risks it undertakes. It might also make sense to include profit in the liability which arises from revenue generating transaction. Depending on which view is taken, inconsistencies in the measurement may arise.

Potential issues to be considered further

38. We will further investigate which central estimates of cash flows are in practice used in different measurements and whether any inconsistencies create issues in practice. IAS 37, for example, permits use of a range of central estimates whereas IAS 36 requires expected values to be used in determining value in use.
39. We would like to hear the EEG's views on whether guidance available is sufficient, both in IFRS and from valuation profession in general.

Question 4 for the EEG

Is there sufficient guidance available in emerging economies to enable the elements of the present value calculation (eg future cash flows) to be determined?

(In practice, are the calculations typically performed by accountants, or by valuation professionals?)

Time value of money

40. In principle, the time value of money represents the minimum risk rate or sometimes referred to as the risk-free rate. This is generally how it is used in Standards in the scope of this review—the following table summarises the meaning attributed to it in relevant Standards.

Standard	refers to TVOM	refers to risk-free rate	TVOM represented by which rate?	risk-free rate = ?	Relevant paragraphs
IFRS 13	yes	yes	market risk-free rate	government bonds (in illustrative examples only)	B13(c)
IAS 19	yes	no	not specified	n/a	84
IAS 36	yes	yes	market risk-free rate	government bonds (in the Basis only)	30 (c), 55 (a), 56, A1 (c), A16(a)
IAS 37	yes	no	not specified apart from TVOM being a market rate	n/a	45 - 47

Table 3 Use of term ‘time value of money’ in IFRS

Time value of money in practice

41. Some regulators, eg in Europe in Australia publish risk-free rates, which aids consistency of application. Academic research³ which included survey on risk-free rates used in a number of jurisdictions has looked at variance in risk-free rates used and finds greater variance in the rates used in some of the emerging markets – the table with their findings is included in Appendix. 2

³ Fernandez, Pablo and Ortiz Pizarro, Alberto and Fernández Acín, Isabel, Discount Rate (Risk-Free Rate and Market Risk Premium) Used for 41 Countries in 2015: A Survey (April 23, 2015). Available at SSRN: <http://ssrn.com/abstract=2598104>

Potential issues to be considered further

42. Determining what the risk-free rate is not easy in practice. We noted that in some jurisdictions regulators assist in this process and wonder if this is something emerging markets are considering? We would like to hear the EEG members' views on this.

Question 5 for the EEG

Is the data required for present value measurement readily available in your jurisdiction, and if so is it consistently used? For example, are there any issues in determining whether there is a deep market in high-quality bonds in order to apply IAS 19 *Employee Benefits*, or finding a pre-tax rate for the value in use calculations in IAS 36 *Impairment of Assets*, **or determining risk-free rate?**

Risk premium

43. What is risk premium? Generally accepted explanation helps here: investors who buy assets have returns that they expect to make over the time horizon over which they will hold the asset. The actual returns that they make over this holding period may be very different from the expected returns, and this is where the risk comes in. Risk in finance is viewed in terms of the variance in actual returns around the expected return.
44. Another way of putting it is that the risk premium is compensation for accepting the uncertainty related to the cash flow estimates which is how it is used in IFRS.
45. This means that simply taking into account expected value using real probabilities does not adjust for the risk⁴. To do so, a separate adjustment is needed.
46. In principle, risk adjustments can increase or decrease a value of assets and liabilities. In existing Standards, however, the risk adjustment usually decreases the value of an asset and increases the value of a liability.

⁴ Some valuation methodologies take risk into account by using risk-adjusted cash-flows or probabilities when calculating expected values.

Practice

47. As indicated in Table 2 on page 8, which provides an overview of components of present value measurement, not all present value measurements in IFRS explicitly include risk premium.
48. For example, some think IAS 37 is explicit in that risk adjustment is required, whereas others think it is not. This could create diversity in practice.
49. There is also practical argument often cited against including risk premium in measurement, which is in that its inclusion is making uncertain measurement in IAS 37 even more uncertain and the resulting measurement less reliable.
50. While requirements for calculation of value in use explicitly require risk to be considered, in practice entities often use an available weighted average cost of capital (WACC) rate, without necessarily adjusting it for the risks specific to the asset being measured. This is something that regulators often point out (see Agenda Paper 1C on stakeholders' views).

Potential issues to be considered further

51. It appears that there are inconsistencies across Standards with respect to whether risk adjustment is included as a part of the measurement. Even when the risk is included, sometimes it is from entity and sometimes from market perspective, which is another potential source of difference—but in practice the difference in perspective may not give rise to different measurement.
52. However, risk is difficult to measure which contributes to potential inconsistencies and lack of comparability. We will do further research on potential differences in practice and their impact.

Liquidity risk

53. Liquidity risk is a relatively new concept in accounting, which is only explicitly addressed in the most recent IASB work (for insurance contracts, for example).
54. IFRS does not discuss liquidity risk in much detail, apart from mentioning it within the context of assessing the activity of a market in IFRS 13. Recent proposals in the Insurance Contracts project also address liquidity risk. The discussion in the

paragraph BCA75 of the Basis for Conclusions of the 2013 Revised Exposure Draft for Insurance Contracts explains the notion:

Discussions of the time value of money often use the notion of risk-free rates. Many use highly liquid, high-quality bonds as a proxy for risk-free rates. However, the holder can often sell such bonds in the market at short notice without incurring significant costs or affecting the market price. This means that the holder of such bonds acquires two things:

(a) a holding in an underlying non-tradable investment, paying a return that is higher than the observed return on the traded bond; and

(b) an embedded option to sell the investment, for which the holder pays an implicit premium through a reduction in the overall return.

55. This ‘implicit premium’ is liquidity premium. Or, we can talk about illiquidity discount which increases the return to compensate for the lack of liquidity.
56. The IAA Monograph *Discount Rates in Financial Reporting—A Practical Guide*⁵ discusses liquidity in some detail, with relevant extracts as follows:

Generally, liquidity for the holder of an asset, such as a corporate bond, can be defined as the ability to quickly sell the asset at a predictable price.

At a basic level, the application of an illiquidity premium for asset valuation results in a less liquid asset having a higher rate of return (lower value) than an otherwise identical asset with higher liquidity, as the owner of that asset requires a greater return to compensate for not being able to trade or exchange it for cash during the period of illiquidity.

The concept of an illiquidity premium within the valuation of liabilities requires a different conceptualisation because there is generally not an actively traded..... Because of this, the liquidity of a liability is often defined with respect to options

⁵ Published in October 2013 by the IAA.

given to the beneficiary. The liquidity of a liability is a function of the basic contract provisions, and especially any options that might exist for the policyholder that would impact the uncertainty regarding the amount and timing of payments.

....

Liquid liabilities have higher uncertainty with respect to the timing and amount of payments. They therefore have a lower illiquidity premium, a lower discount rate and a higher liability value.

57. Whilst a distinct notion, liquidity could also be seen as a part of overall risk premium.

Practice

58. Both IAS 36 and IAS 37 describe the discount rate as the rate that reflects the time value of money and the risks specific to the asset/liability. IAS 36 further specifies these risks to include uncertainty risk as well as other market factors, such as illiquidity, that market participants would take into account. IAS 37 mentions uncertainty risk (risk adjustment), but it does not mention liquidity risk. We understand concept of liquidity risk was not well known to most accountants at the time when IAS 37 was developed. However, if the objective of both measurements is to reflect risks specific to a liability, one could expect the measurements to consider the same factors.
59. We have seen no evidence that liquidity is specifically considered in when applying measurement requirements in IAS 37 or for value in use in IAS 36.
60. However, measuring provisions is already a difficult task because of their uncertainty and because of the long time scales usually involved. Requiring entities to specifically reflect liquidity risks might bring more costs than benefits. Consider this statement in one of the research reports issued by the credit rating agency Moody's:

Liquidity is recognised to be an important factor in determining asset prices. However, both the basic principle of applying liquidity adjustments to liabilities and the objective measurement of liability characteristics and point-in-time

liquidity 'prices' remains controversial and technically challenging.

Potential issues to be considered further

- 61. The question of whether liquidity adjustments should be included in entity-specific measurements has only been considered by the IASB in any detail in the insurance contracts project. More work is needed to assess whether it is an issue that should be addressed in the context of other liabilities.
- 62. We will further consider practical implications of potentially including liquidity risk in all entity-specific measurements. This could have major impact on both pension liabilities and provisions, which are generally not liquid and would therefore require a illiquidity discount, increasing the discount rate and reducing the liabilities recognised. For value in use, the impact would depend on the liquidity characteristics of the asset measured compared to the liquidity of entire asset portfolio in the unit for which WACC is determined.

Own credit risk

- 63. Own credit risk is the risk that the entity may default on its financial obligations. As such, it is usually only relevant to liabilities.
- 64. The IASB has considered dealing with own credit risk through a cross-cutting project in 2009. The following section provides some background.

IASB Discussion Paper on credit risk

- 65. In June 2009 the IASB published the Discussion Paper *Credit Risk in Liability Measurement* (the DP). The DP sought respondents' views on when and how credit risk should be included in liability measurement.
- 66. During its October 2009 meeting, the IASB discussed the 102 comment letters received and the next steps.
- 67. A summary of respondents' views on inclusion of credit risk in the measurement of different liabilities is shown in the following table.

	Measurement	Include own credit risk?
--	-------------	--------------------------

		Initial measurement	Subsequent measurement
Financial liabilities	Fair value	Yes	Yes
	Other than fair value	Yes	No
Non-financial liabilities	Fair value	Yes	Yes
	Other than fair value		
	- initial consideration exchanged	Yes	No
	- no initial consideration exchanged	No	No

68. The IASB’s discussion and decisions were summarised as follows:
- (a) The Board considered a summary of the responses to the discussion paper *Credit Risk in Liability Measurement*. The Board decided to stop work on credit risk as a separate project. The Board also tentatively decided:
 - (i) not to reach a general conclusion on credit risk at this time and instead to incorporate the topic into the Conceptual Framework measurement project;
 - (ii) not to change the role of credit/performance risk in the definition of fair value;
 - (iii) to consider the application of the fair value definition in measurements that would otherwise be at fair value; and
 - (iv) to consider the question of credit risk in every project that involves current measurement of liabilities that are not fair value.

IAS 37 and credit risk

69. IAS 37 does not provide detailed requirements with respect to own credit risk—as discussed in Agenda paper 1A all the Standard says is that the discount rate used in measurement should reflect risks specific to the liability.
70. Some asked whether liability recognised in accordance with IAS 37 should reflect own credit risk. This issue was raised with the Interpretations Committee (IFRIC,

now 'IFRS IC') in 2010. The IFRIC referred the matter to the IASB, which was conducting a project to revise IAS 37 at the time (see the Agenda Paper 1C). However, the IASB halted its project before reaching any decisions on own credit risk.

71. At the time of the IFRS IC discussion, a general view was expressed that most entities excluded own credit risk from the measurement of provisions, because own credit risk is not considered to be a 'risk specific to the liability' (but is instead specific to the entity that has the liability)⁶.
72. During this research project, we have consulted accounting guides issued by major audit firms, spoken to some auditors and reviewed annual reports of entities. On the basis of this limited evidence, it appears that most entities outside Canada exclude own credit risk.
73. This issue was raised with the IFRS IC by entities adopting IFRS for the first time in Canada for whom provisions were significant (as is the case for oil and gas and mining industries). It is our anecdotal understanding that some of these entities interpreted the IFRS IC decision as giving them a choice and have adopted an approach that includes own credit risk in IAS 37 discount rate, which is an approach consistent with Canadian GAAP before IFRS was adopted.
74. It is our understanding that entities outside Canada have continued to exclude own credit risk from IAS 37 discount rate, so divergence in practice is limited.

Potential issues to be considered further

75. All entity-specific present value measurements of liabilities seem to, in practice, exclude own credit risk from the measurement. This is however not explicitly stated in the requirements. Making this explicit may help eliminate any potential diversity in practice.
76. Now that we have discussed each of the components of present value measurement, the following section discusses how these components are brought together in present value measurement—there are many ways in which this can be achieved!

⁶ Although one could also argue that if the liability is that of an entity, anything specific to the entity, such as its credit risk, is also specific to the liability.

Methodology

77. Three main principles apply when applying present value measurement method using discounted cash flows:
- Do not double-count; for example if risk is reflected in the estimates of the cash flows, the discount rate used should be risk-free rate.
 - Use internally consistent assumptions; if cash flows are determined after tax, the discount rate used should also be after tax.
 - Make sure to include everything; ie do not forget.
78. Some Standards prescribe the method by which present value calculation should be performed (eg IAS 37 stipulates the use of pre-tax discount rates and the corresponding pre-tax cash flows) whereas others do not and merely emphasise the principles above. IFRS 13 and IAS 36 provide the most comprehensive guidance for present value methodology—the guidance from IFRS 13 is included in Appendix 1 to this paper.
79. We have identified three main aspects of present value measurement methodology in IFRS, including:
- (a) How are risk adjustments reflected, ie whether as an adjustment to the rate, cash flows (or a separate measurement item)?
 - (b) How is tax accounted for, ie are inputs on a post-tax or a pre-tax basis?
 - (c) How is inflation accounted for, ie are inputs real or nominal?
80. The table on the following page shows how different Standards deal with them:

Standard/ Project	Item measured	Measurement attribute	Adjustment in rate or cash flows	Rate pre-tax/ post-tax or either	Rate real/nominal or either
IFRS 13	Assets and liabilities at fair value	Fair value	either	either	either
IAS 36	Non-financial assets (impairment)	Value in use	either	pre-tax	either
Insurance Contracts	Insurance liability/asset	Present value of amount to fulfil	either	pre-tax (implicit)	either
IAS 37	Provisions	The amount to settle or transfer	either	pre-tax	either (implicit)
IAS 19	Defined benefit plan obligation	Present value of ultimate cost	n/a	pre-tax	nominal (unless real more reliable)

Table 4 Present value measurement methodology in current present value measurements

81. We discuss each of these aspects in the following sections as well as some other methodology considerations. As we go through various aspects of present value measurement methodology we would like to get the EEG members input on how well understood they are and if method is influenced by specific circumstances in emerging economies.

Question 6 for the EEG

Is the method of present value measurement generally understood, and consistently applied in accounting in your jurisdiction?

Are there economic factors in your jurisdiction not commonly found outside emerging economies that may have an effect on how present value measurement is applied (eg inflation, market liquidity)?

Do the benefits of present value measurement justify the costs of applying it in emerging economies?

Adjustments to the rate vs cash flows

82. The resulting measurement is the same regardless of whether adjustments are made to the rate or the cash flows. However, some think it is more reliable to adjust the cash flows because it avoids the assumption that the same risk adjustments are appropriate in each period and makes the risk-adjustment process easier⁷ from the point of view of the person doing the calculation. In particular, it avoids the misperception that the risk-adjusted discount rate for a liability will normally be higher than the risk-free rate, which would result in misstatement. However, some investors prefer to see an adjusted rate, because they find that easier to understand.
83. Further, if the unwinding of the discount occurs, such as in pensions and provisions and also in insurance, the resulting interest cost will be affected by whether the risk-adjustment is included in the discount rate or not. This is not an issue for value in use and fair value calculations where there is no unwinding.

Potential issues to be considered further

84. We will further consider the impact of making adjustments to the rate versus the cash flows.

Tax

85. The use of pre-tax discount rates in present value measurements is often required in IFRSs (see Agenda Paper 1A). The pre-tax rate is not defined in IFRS and can be described as the rate of return, before any tax payable on related cash flows is taken into account. The pre-tax rate is often observable in the market; for example the yield on bonds or on property is a pre-tax rate, as this is the yield, before any tax is payable. The post-tax rate is lower than the pre-tax rate, as it reflects returns after any tax due

⁷ Some have comparing including the risk in the rate with making a guess. We understand Warren Buffet also prefers reflecting risks through cash flow calculation and not the rate.

on the cash flows is paid (see examples in Appendix 2 which illustrate pre and post-tax rates).

86. Pre-tax rate is sometimes misunderstood as a rate which does not depend on tax – but from the perspective of the holder of an asset, the required pre-tax rate is the same as the required post-tax rate, plus the tax that will be payable. The required pre-tax rate therefore depends on the rate of tax as well as the timing of tax cash flows.
87. In theory, applying pre-tax, higher, rate to discount pre-tax, higher, cash flows gives the same result as using post-tax, lower, rate to post-tax, lower, cash flows. In both cases the result is a measurement on a post-tax basis. This means such measurement already includes the effect of tax and no further adjustments for tax are needed.
88. In practice, two complications arise; one relates to conversion from post-tax to pre-tax rate and the other one is the interaction with deferred tax and potential double-counting. These are described in the following sections.

Conversion from post-tax to pre-tax rates.

89. IAS 36 requires use of pre-tax rates when determining value in use. Cash flows used in value in use calculations are typically available on a pre-tax basis so can be used as available (as all inputs have to be consistent, ie pre-tax). However, entities usually use WACC as a starting point for determining the discount rate, in accordance with guidance in IAS 36. WACC is usually a post-tax rate, from the entity's perspective. Now, as IAS 36 requires entities to use pre-tax rate, what happens next is that the post-tax rate is translated to the pre-tax rate. This is usually done by using a simple formula of dividing post-tax rate by (1-tax rate) which features in many accounting manuals.
90. This formula however only works in the very simple scenario of perpetual returns with no growth. In other cases calculation using this formula is wrong. There are two main reasons for this:
 - (a) Pre and post-tax cash flows are not always related by the factor of (1-tax rate). This is because not every cash flow is taxed the same (eg return of capital is usually not taxed whereas the return on capital is).

- (b) A linear relationship between pre and post-tax rate only exists when cash flows are even.
91. A number of other formulas have been devised to convert post-tax to pre-tax rate in other scenarios, eg to take into account steady growth, finite number of periods etc. Yet the fact is these are also much simpler than real-life scenarios and therefore converting the post-tax to pre-tax rate often gives erroneous answers.
92. As a result, many academics and valuation professionals recommend using post-tax rates available and converting pre-tax cash flows to post-tax cash flows.
93. This has led to some divergence in practice. Some companies use post-tax rates and post-tax cash flows, whereas others convert post-tax rates to pre-tax rates and apply these to pre-tax cash flows. Some disclose pre-tax rates, post-tax rates, or both.
94. Regulatory practice also differs⁸, some regulators state they now accept calculations on post-tax basis (eg France, Australia), whereas others have taken regulatory action to require companies to use and disclose pre-tax discount rate (eg Netherlands).

Potential double-counting of tax effect

95. As already stated, using pre-tax inputs should give the same measurement as using post-tax inputs. The resulting measurement is on a post-tax basis, ie the measurement is net of any tax to be paid on future cash flows. Combinations of different tax perspective of inputs and resulting measurements are shown in the following table:

	Pre-tax cash flows	Post-tax cash flows
Pre-tax rate	post-tax measurement*	double-counting of tax effect
Post-tax rate	pre-tax measurement	post-tax measurement

Table 5 Tax permutations

⁸ Based on information provided by IOSCO Committee 1 on Issuer Accounting, Audit and Disclosure which comprises 28 members.

96. However, in some circumstances deferred tax arises, which is then recognised separately in accordance with IAS 12. This means that measurement in individual Standards is not always on post-tax basis. IAS 37 appears to recognise this, and in paragraph 41 states that ‘The provision is measured before tax, as the tax consequences of the provision, and changes in it, are dealt with under IAS 12’. However, if using pre-tax rates, which are required by IAS 37, the resulting measurement cannot be before tax. What seems to be the case is that, in cases where deferred tax arises, discount rates used for the underlying measurement reflect some, but not all of the tax due, so the tax effect has to be recognised separately. This is not very clearly explained in IFRS requirements and sometimes can give rise to overstatement of future tax benefits. Appendix 2 includes examples illustrating the issue.

Potential issues to be considered further

97. The difference in the way a post-tax rate is adjusted to arrive at a pre-tax rate can mean the difference between impairment and no impairment in IAS 36. Explaining that a simple grossing-up of post-tax rate to arrive at a pre-tax rate does not always give the right answer may go some way to help. Currently only Basis for Conclusions of IAS 36 explains this (paragraph BCZ85 of IAS 36 Basis for Conclusions). But the question is whether this is a job for the IASB or a job for the valuation profession.
98. We need to do more work to fully understand the effects in practice of using pre-tax rates and the interaction with IAS 12. In principle, the pre-tax rate should be a rate that only reflects tax effects that will not be picked up by the application of IAS 12. If a pre-tax rate includes other tax effects (ie tax effects that are picked up by the application of IAS 12), the tax effects will be overstated. The effect of this overstatement would be consistent within jurisdiction (if same tax regime applies) but it still affects comparability depending on how many items that give rise to overstatement an entity has. It would also affect comparability between jurisdictions, especially if they have different tax regimes. However, the impact of the potential misstatement may not be material and needs to be understood before any action is recommended.

Inflation

99. Similar as with tax, present value measurement can use inputs which are either before or after inflation (ie nominal or real) and, providing the inputs are consistent, the resulting measurement is the same.
100. IFRS measurements are mostly based on nominal discount rates (with nominal cash flows). Real rates are sometimes found in practice in IAS 37 and occasionally in IAS 19. Resulting measurement is the same. Recently the IASB considered this in the context of insurance contracts – we will incorporate those considerations in the final research paper.
101. The question is to what extent differences in the approach cause differences measurement, eg the amounts recognised when unwinding of discount. We will research this further.

Other methodology considerations*Which date for the rate*

102. We are doing further research on the following:
- (a) whether to use discount rate at the beginning or end of period for unwinding of discount (some Standards, like IAS 19 require rates from the beginning of period to be used (paragraph 123 of IAS 19), others are silent). This has the effect on the amount of interest recognising and indirectly also affects the amount recognised as remeasurement. The advantage of using the rates at the beginning of the period is that they are known, ie you do not have to wait until year-end. The advantage of using the dates at year-end is that, unless there has been a change in the estimated future cash flows, no other reassessment is needed.
 - (b) whether it is meaningful to use the rates on the last day of a reporting period, when markets may be quite thin. For example, there is usually little market activity on dates such as 31 December and the rates available on that day may be misleading. Anecdotal evidence suggests year-end rates are quite different from the rates available only a few days earlier or later, with

the main reason being the market liquidity. We are currently collecting further evidence on the potential impact of this.

Top-down vs bottom up

103. If the rate we require for measurement is not available in the market, there are two main approaches as to the which starting point to use:
- (a) Use risk-free rates available in the market and add components relevant to the asset/liability measured. This is sometimes referred to as bottom-up approach
 - (b) Use rates available for a different asset in the market and adjust it to remove components not relevant to the asset/liability measured and add any relevant components not included. This is sometimes referred to as top-down approach.
104. These different methods were only discussed in insurance project – we will do further research on potential impact different approaches may have on other measurements.

Use of yield curves

105. Yield curve shows interest rates for different maturities and can be used in measurement involving cash flows at different durations, instead of a single rate.
106. Use of yield curves is increasingly popular but comes with a number of challenges, with scope for inconsistent application. For example, a topical question is what rate from the yield curve to include when determining unwinding of discount for the period. The other question is how to adjust available market data for the duration of the item measured. The different choices may have a material impact.
107. The question is whether any guidance is needed and would help to ensure consistent approach. Another question is if this is something to be addressed by an accounting standard-setter.

The way forward

108. We have an overarching question – given that there is only one fair value, is there a good reason that every Standard requiring entity-specific values requires somewhat different cash flows and the discount rate to be used? In principle maybe not. But, there are also some good reasons for differences, both practical and conceptual.
109. Nonetheless, there may be an opportunity to simplify financial reporting by bringing entity-specific values closer together. More specifically, it could help to clarify which individual components of the discount rate should be included in the measurements (and when), and to improve comparability and consistency in the methodology applied.
110. But, how can this be achieved? The Conceptual Framework ED proposes high-level definitions of value in use and fulfilment value but also envisages the use of ‘customised’ measurement bases to achieve the most relevant information. Use of such customised measurement bases would need to be justified by the IASB in the Basis for Conclusions to the relevant standard. These proposals would provide a framework in which to make decisions about the different components to be included in a present value measure and hence would provide some discipline to that decision-making process in the future. Is this enough, or is more detailed guidance needed?
111. Further, the IASB will not automatically change existing Standards as a result of these proposals. If an existing Standard works well in practice, the IASB will not propose an amendment to that Standard simply because of an inconsistency with the revised *Conceptual Framework*. Any decision to amend an existing Standard would require the IASB to go through its normal due process for adding a project to its agenda and developing an Exposure Draft and an amendment to that Standard. So, is there a need to revise existing Standards in relation to discount rates? If so, should this be done by looking at:
- (a) generic guidance on entity-specific values, ie a Standard similar to IFRS 13 on fair value measurement, and revising existing Standards to be consistent with that guidance, or

- (b) targeted improvements to specific Standards, justified from cost/benefit perspective? (But note that preparers are against this in principle and have asked for a bigger packages of changes, if any changes are to be made.)
112. Is there a role for education materials, in addition or instead of standard-setting activities, especially to bridge the gaps in emerging economies?
113. These are the questions we would like to get the EEG input on.

Questions for the EEG

Question 7

What should the IASB do about the identified differences and issues in the application of present value measurement?

Question 8

What effects, if any, would there be for emerging economies if the IASB decided to address some of the issues; eg via

- smaller projects on particular aspects? One example may be a project consider whether and how to include risk and liquidity adjustments in all present value measurements that require current values?; or
- larger, cross-cutting project on present value measurement (similar to IFRS 13 Fair Value Measurement) setting a consistent methodology for present value measurement?; or
- education or similar material?

Appendix 1 – present value measurement guidance included in IFRS 13

Present value techniques

- B12 Paragraphs B13–B30 describe the use of present value techniques to measure fair value. Those paragraphs focus on a discount rate adjustment technique and an *expected cash flow* (expected present value) technique. Those paragraphs neither prescribe the use of a single specific present value technique nor limit the use of present value techniques to measure fair value to the techniques discussed. The present value technique used to measure fair value will depend on facts and circumstances specific to the asset or liability being measured (eg whether prices for comparable assets or liabilities can be observed in the market) and the availability of sufficient data.

The components of a present value measurement

- B13 Present value (ie an application of the income approach) is a tool used to link future amounts (eg cash flows or values) to a present amount using a discount rate. A fair value measurement of an asset or a liability using a present value technique captures all the following elements from the perspective of market participants at the measurement date:
- (a) an estimate of future cash flows for the asset or liability being measured.
 - (b) expectations about possible variations in the amount and timing of the cash flows representing the uncertainty inherent in the cash flows.
 - (c) the time value of money, represented by the rate on risk-free monetary assets that have maturity dates or durations that coincide with the period covered by the cash flows and pose neither uncertainty in timing nor risk of default to the holder (ie a risk-free interest rate).
 - (d) the price for bearing the uncertainty inherent in the cash flows (ie a *risk premium*).
 - (e) other factors that market participants would take into account in the circumstances.
 - (f) for a liability, the non-performance risk relating to that liability, including the entity's (ie the obligor's) own credit risk.

General principles

- B14 Present value techniques differ in how they capture the elements in paragraph B13. However, all the following general principles govern the application of any present value technique used to measure fair value:
- (a) Cash flows and discount rates should reflect assumptions that market participants would use when pricing the asset or liability.
 - (b) Cash flows and discount rates should take into account only the factors attributable to the asset or liability being measured.
 - (c) To avoid double-counting or omitting the effects of risk factors, discount rates should reflect assumptions that are consistent with those inherent in the cash flows. For example, a discount rate that reflects the uncertainty in expectations about future defaults is appropriate if using contractual cash flows of a loan (ie a discount rate adjustment technique). That same rate should not be used if using expected (ie probability-weighted) cash flows (ie an expected present value technique) because the expected cash flows already reflect assumptions about the uncertainty in future defaults; instead, a discount rate that is commensurate with the risk inherent in the expected cash flows should be used.
 - (d) Assumptions about cash flows and discount rates should be internally consistent. For example, nominal cash flows, which include the effect of inflation, should be discounted at a rate that includes the effect of inflation. The nominal risk-free interest rate includes the effect of inflation. Real cash flows, which exclude the effect of inflation, should be discounted at a rate that excludes the effect of inflation. Similarly, after-tax cash flows should be discounted using an after-tax discount rate. Pre-tax cash flows should be discounted at a rate consistent with those cash flows.
 - (e) Discount rates should be consistent with the underlying economic factors of the currency in which the cash flows are denominated.

Risk and uncertainty

- B15 A fair value measurement using present value techniques is made under conditions of uncertainty because the cash flows used are estimates rather than known amounts. In many cases both the amount and timing of the cash flows are uncertain. Even contractually fixed amounts, such as the payments on a loan, are uncertain if there is risk of default.
- B16 Market participants generally seek compensation (ie a risk premium) for bearing the uncertainty inherent in the cash flows of an asset or a liability. A fair value measurement should include a risk premium reflecting the amount that market participants would demand as compensation for the uncertainty inherent in the cash flows. Otherwise, the measurement would not faithfully represent fair value. In some cases determining the appropriate risk premium might be difficult. However, the degree of difficulty alone is not a sufficient reason to exclude a risk premium.
- B17 Present value techniques differ in how they adjust for risk and in the type of cash flows they use. For example:
- (a) The discount rate adjustment technique (see paragraphs B18–B22) uses a risk-adjusted discount rate and contractual, promised or most likely cash flows.
 - (b) Method 1 of the expected present value technique (see paragraph B25) uses risk-adjusted expected cash flows and a risk-free rate.
 - (c) Method 2 of the expected present value technique (see paragraph B26) uses expected cash flows that are not risk-adjusted and a discount rate adjusted to include the risk premium that market participants require. That rate is different from the rate used in the discount rate adjustment technique.

Discount rate adjustment technique

- B18 The discount rate adjustment technique uses a single set of cash flows from the range of possible estimated amounts, whether contractual or promised (as is the case for a bond) or most likely cash flows. In all cases, those cash flows are conditional upon the occurrence of specified events (eg contractual or promised cash flows for a bond are conditional on the event of no default by the debtor). The discount rate used in the discount rate adjustment technique is derived from observed rates of return for comparable assets or liabilities that are traded in the market. Accordingly, the contractual, promised or most likely cash flows are discounted at an observed or estimated market rate for such conditional cash flows (ie a market rate of return).
- B19 The discount rate adjustment technique requires an analysis of market data for comparable assets or liabilities. Comparability is established by considering the nature of the cash flows (eg whether the cash flows are contractual or non-contractual and are likely to respond similarly to changes in economic conditions), as well as other factors (eg credit standing, collateral, duration, restrictive covenants and liquidity). Alternatively, if a single comparable asset or liability does not fairly reflect the risk inherent in the cash flows of the asset or liability being measured, it may be possible to derive a discount rate using data for several comparable assets or liabilities in conjunction with the risk-free yield curve (ie using a 'build-up' approach).
- B20 To illustrate a build-up approach, assume that Asset A is a contractual right to receive CU800¹ in one year (ie there is no timing uncertainty). There is an established market for comparable assets, and information about those assets, including price information, is available. Of those comparable assets:
- (a) Asset B is a contractual right to receive CU1,200 in one year and has a market price of CU1,083. Thus, the implied annual rate of return (ie a one-year market rate of return) is 10.8 per cent $[(CU1,200/CU1,083) - 1]$.
 - (b) Asset C is a contractual right to receive CU700 in two years and has a market price of CU566. Thus, the implied annual rate of return (ie a two-year market rate of return) is 11.2 per cent $[(CU700/CU566)^{0.5} - 1]$.
 - (c) All three assets are comparable with respect to risk (ie dispersion of possible pay-offs and credit).
- B21 On the basis of the timing of the contractual payments to be received for Asset A relative to the timing for Asset B and Asset C (ie one year for Asset B versus two years for Asset C), Asset B is deemed more comparable to Asset A. Using the contractual payment to be received for Asset A (CU800) and the one-year market rate derived from Asset B (10.8 per cent), the fair value of Asset A is CU722 $(CU800/1.108)$.

¹ In this IFRS monetary amounts are denominated in 'currency units (CU)'.

Alternatively, in the absence of available market information for Asset B, the one-year market rate could be derived from Asset C using the build-up approach. In that case the two-year market rate indicated by Asset C (11.2 per cent) would be adjusted to a one-year market rate using the term structure of the risk-free yield curve. Additional information and analysis might be required to determine whether the risk premiums for one-year and two-year assets are the same. If it is determined that the risk premiums for one-year and two-year assets are not the same, the two-year market rate of return would be further adjusted for that effect.

- B22 When the discount rate adjustment technique is applied to fixed receipts or payments, the adjustment for risk inherent in the cash flows of the asset or liability being measured is included in the discount rate. In some applications of the discount rate adjustment technique to cash flows that are not fixed receipts or payments, an adjustment to the cash flows may be necessary to achieve comparability with the observed asset or liability from which the discount rate is derived.

Expected present value technique

- B23 The expected present value technique uses as a starting point a set of cash flows that represents the probability-weighted average of all possible future cash flows (ie the expected cash flows). The resulting estimate is identical to expected value, which, in statistical terms, is the weighted average of a discrete random variable's possible values with the respective probabilities as the weights. Because all possible cash flows are probability-weighted, the resulting expected cash flow is not conditional upon the occurrence of any specified event (unlike the cash flows used in the discount rate adjustment technique).
- B24 In making an investment decision, risk-averse market participants would take into account the risk that the actual cash flows may differ from the expected cash flows. Portfolio theory distinguishes between two types of risk:
- (a) unsystematic (diversifiable) risk, which is the risk specific to a particular asset or liability.
 - (b) systematic (non-diversifiable) risk, which is the common risk shared by an asset or a liability with the other items in a diversified portfolio.

Portfolio theory holds that in a market in equilibrium, market participants will be compensated only for bearing the systematic risk inherent in the cash flows. (In markets that are inefficient or out of equilibrium, other forms of return or compensation might be available.)

- B25 Method 1 of the expected present value technique adjusts the expected cash flows of an asset for systematic (ie market) risk by subtracting a cash risk premium (ie risk-adjusted expected cash flows). Those risk-adjusted expected cash flows represent a certainty-equivalent cash flow, which is discounted at a risk-free interest rate. A certainty-equivalent cash flow refers to an expected cash flow (as defined), adjusted for risk so that a market participant is indifferent to trading a certain cash flow for an expected cash flow. For example, if a market participant was willing to trade an expected cash flow of CU1,200 for a certain cash flow of CU1,000, the CU1,000 is the certainty equivalent of the CU1,200 (ie the CU200 would represent the cash risk premium). In that case the market participant would be indifferent as to the asset held.
- B26 In contrast, Method 2 of the expected present value technique adjusts for systematic (ie market) risk by applying a risk premium to the risk-free interest rate. Accordingly, the expected cash flows are discounted at a rate that corresponds to an expected rate associated with probability-weighted cash flows (ie an expected rate of return). Models used for pricing risky assets, such as the capital asset pricing model, can be used to estimate the expected rate of return. Because the discount rate used in the discount rate adjustment technique is a rate of return relating to conditional cash flows, it is likely to be higher than the discount rate used in Method 2 of the expected present value technique, which is an expected rate of return relating to expected or probability-weighted cash flows.
- B27 To illustrate Methods 1 and 2, assume that an asset has expected cash flows of CU780 in one year determined on the basis of the possible cash flows and probabilities shown below. The applicable risk-free interest rate for cash flows with a one-year horizon is 5 per cent, and the systematic risk premium for an asset with the same risk profile is 3 per cent.

Possible cash flows	Probability	Probability-weighted cash flows
CU500	15%	CU75
CU800	60%	CU480
CU900	25%	CU225
Expected cash flows		CU780

- B28 In this simple illustration, the expected cash flows (CU780) represent the probability-weighted average of the three possible outcomes. In more realistic situations, there could be many possible outcomes. However, to apply the expected present value technique, it is not always necessary to take into account distributions of all possible cash flows using complex models and techniques. Rather, it might be possible to develop a limited number of discrete scenarios and probabilities that capture the array of possible cash flows. For example, an entity might use realised cash flows for some relevant past period, adjusted for changes in circumstances occurring subsequently (eg changes in external factors, including economic or market conditions, industry trends and competition as well as changes in internal factors affecting the entity more specifically), taking into account the assumptions of market participants.
- B29 In theory, the present value (ie the fair value) of the asset's cash flows is the same whether determined using Method 1 or Method 2, as follows:
- (a) Using Method 1, the expected cash flows are adjusted for systematic (ie market) risk. In the absence of market data directly indicating the amount of the risk adjustment, such adjustment could be derived from an asset pricing model using the concept of certainty equivalents. For example, the risk adjustment (ie the cash risk premium of CU22) could be determined using the systematic risk premium of 3 per cent ($CU780 - [CU780 \times (1.05/1.08)]$), which results in risk-adjusted expected cash flows of CU758 ($CU780 - CU22$). The CU758 is the certainty equivalent of CU780 and is discounted at the risk-free interest rate (5 per cent). The present value (ie the fair value) of the asset is CU722 ($CU758/1.05$).
 - (b) Using Method 2, the expected cash flows are not adjusted for systematic (ie market) risk. Rather, the adjustment for that risk is included in the discount rate. Thus, the expected cash flows are discounted at an expected rate of return of 8 per cent (ie the 5 per cent risk-free interest rate plus the 3 per cent systematic risk premium). The present value (ie the fair value) of the asset is CU722 ($CU780/1.08$).
- B30 When using an expected present value technique to measure fair value, either Method 1 or Method 2 could be used. The selection of Method 1 or Method 2 will depend on facts and circumstances specific to the asset or liability being measured, the extent to which sufficient data are available and the judgements applied.⁹

⁹ Extracted from IFRS 13, Fair Value Measurement. © IFRS Foundation.

Appendix 2 – Risk-free rates used in 2015 – academic research findings¹⁰

Table 3. Risk Free Rate (RF) used for 41 countries in 2015

RF	Number of answers	average	Median	St. Dev.	max	min	Av-Median
USA	1983	2,4%	2,3%	1,1%	8,0%	0,0%	0,1%
Spain	443	2,2%	2,0%	1,2%	7,0%	0,0%	0,2%
Germany	252	1,3%	1,1%	0,8%	5,1%	-0,2%	0,2%
France	122	1,5%	1,3%	1,0%	5,1%	0,0%	0,3%
United Kingdom	101	2,1%	2,1%	0,8%	6,0%	0,4%	0,0%
Italy	83	1,5%	1,3%	1,1%	5,0%	0,0%	0,2%
Canada	81	2,3%	2,0%	1,0%	6,0%	0,8%	0,3%
Portugal	72	1,6%	1,5%	0,9%	5,0%	0,0%	0,1%
Switzerland	71	1,1%	1,0%	0,7%	4,0%	0,0%	0,1%
Belgium	70	1,3%	1,0%	0,9%	5,0%	0,0%	0,3%
Sweden	68	1,1%	1,0%	0,8%	4,0%	0,0%	0,1%
Denmark	65	1,3%	1,0%	1,0%	5,0%	-0,1%	0,3%
Finland	64	1,2%	1,0%	0,9%	5,0%	0,0%	0,2%
Japan	61	0,7%	0,5%	1,0%	7,0%	-0,7%	0,2%
Norway	61	1,4%	1,0%	1,1%	5,0%	-0,2%	0,4%
Brazil	59	9,0%	9,0%	2,8%	13,1%	3,2%	0,0%
Ireland	59	1,3%	1,0%	0,9%	5,0%	-0,1%	0,3%
China	55	4,5%	4,0%	2,1%	13,0%	2,0%	0,5%
Mexico	55	4,3%	4,0%	1,0%	7,0%	2,8%	0,3%
Russia	48	7,4%	7,0%	2,7%	15,0%	3,0%	0,4%
India	43	7,4%	7,5%	1,1%	9,0%	4,0%	-0,1%
South Africa	43	8,2%	8,4%	0,9%	9,4%	5,5%	-0,1%
Australia	40	3,1%	3,0%	1,1%	6,0%	1,5%	0,2%
Chile	37	3,9%	3,8%	1,1%	6,1%	2,1%	0,1%
Uruguay	37	3,6%	3,6%	0,4%	4,1%	3,0%	0,0%
Poland	36	2,7%	2,7%	0,5%	3,8%	1,6%	0,0%
Peru	35	4,0%	4,0%	0,9%	6,0%	2,1%	0,0%
Czech Republic	34	1,8%	1,5%	1,1%	4,4%	0,2%	0,3%
Indonesia	34	7,5%	7,5%	0,4%	8,8%	7,0%	0,0%
Israel	34	0,9%	0,6%	1,0%	3,0%	-0,6%	0,3%
Korea (South)	33	2,3%	2,3%	0,6%	4,0%	1,5%	0,1%
Netherlands	33	1,8%	1,8%	0,6%	3,0%	0,5%	0,0%
New Zealand	31	2,9%	3,2%	0,9%	4,0%	1,0%	-0,3%
Thailand	31	8,7%	9,0%	2,1%	11,7%	3,0%	-0,3%
Turkey	31	7,8%	7,6%	0,7%	9,4%	6,0%	0,2%
Austria	29	2,8%	2,8%	1,2%	5,0%	0,5%	0,0%
Greece	29	15,0%	15,0%	5,5%	25,0%	5,0%	0,0%
Colombia	28	3,8%	3,6%	1,2%	6,0%	2,2%	0,2%
Hungary	28	0,6%	0,5%	1,0%	4,0%	-0,9%	0,1%
Venezuela	28	3,5%	3,2%	1,6%	8,0%	1,0%	0,3%
Argentina	26	12,6%	12,4%	4,5%	19,0%	3,2%	0,1%

¹⁰ Fernandez, Pablo and Ortiz Pizarro, Alberto and Fernández Acín, Isabel, Discount Rate (Risk-Free Rate and Market Risk Premium) Used for 41 Countries in 2015: A Survey (April 23, 2015). Available at SSRN: <http://ssrn.com/abstract=2598104>

Appendix 3 – interaction of discount rate and taxes

- A1. We consider the interaction of the tax and the discount rates using examples applying IAS 19 and IAS 37 as well as interaction with IAS 12.
- A2. Example —IAS 19 Employee Benefits
- A3. Imagine two identical pension liabilities, with a cash outflow of CU100 at the end of five years. If these carry no risks and there are no associated tax deductions, and the pure time value of money rate (ie rate net of any tax, ie post-tax rate) is 7 per cent, then the value of both of these is CU71¹¹, calculated as follows.

Liability 1&2	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Cash flows					100.0	100.0
PV of CF @7%	-	-	-	—	71.3	71.3
Pre-tax value of Liabilities 1&2						71.3

- A4. Now let us consider what happens if the pension costs are tax-deductible, with a tax rate of 30 per cent. Say one liability attracts tax deductions on the service cost and interest charges that have been recognised. The other liability receives a tax deduction only when the benefit is paid, ie after 5 years¹². (These differing tax treatments of pension liabilities are common, as pension taxes are specific to a jurisdiction.) Let us also assume that, at the time of measuring Liability 1 (Year 1), tax benefit on the service cost charge has already been received (year 0).
- A5. The value of the two liabilities is different – this is because their value reflects two components; their pre-tax value (which is the same for both, ie CU71.3) plus the value of their respective tax benefits, which is different. In other words, Liability 1 is more onerous because it will attract less tax deduction in the future, it is therefore higher than Liability 2.
- A6. We can calculate the values of these two liabilities using gross cash flows, tax cash flows and the pure, post-tax, rate. We can also calculate these values using only

¹¹ To simplify the example, we assume IAS 19 measurement objective is to arrive at the economic value of the liabilities.

¹² In real life, tax deductions in current period can be unrelated to the measurement of the liability in current period (eg in the UK deductions are given on contributions to the fund which can be anything) making things even more complicated.

one, gross, cash flow (CU100), and a rate grossed up for the effect of tax (so called pre-tax rate). This, pre-tax, rate is different for the two liabilities because of their differing tax effects.

A7. Both ways of calculating the value of the two liabilities are shown in the following table:

Liability 1	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Gross cash flows (pre-tax)	—	—	—	—	100.0	100.0
Tax benefit (30%)	1.9	2.0	2.3	2.5	2.7	11.4
Post-tax CF	1.9	2.0	2.3	2.5	97.3	88.6
PV post tax cash flows @7%	1.7	1.8	1.8	1.9	69.4	62.1
Liability 1 value using post-tax inputs	62.1					
Pre-tax rate (using IRR formula)	10%					
PV pre-tax cash flows@10%	—	—	—	—	62.1	62.1
Liability 1 value using pre-tax inputs	62.1					

Liability 2	1	2	3	4	5	Total
Gross cash flows (pre-tax)	—	—	—	—	100	
Tax (30%)					30.0	30.0
Post-tax CF	—	—	—	—	70.0	70.0
PV post tax cash flows @7%	—	—	—	—	49.9	49.9
Liability 2 value using post-tax inputs	49.9					
Pre-tax rate (using IRR formula)	14.9%					

Liability 1	Year 1	Year 2	Year 3	Year 4	Year 5	Total
PV pre-tax cash flows@14.9%	—	—	—	—	49.9	49.9
Liability 2 value using pre-tax inputs						49.9

- A8. In words, the liability 2 is calculated as present value of cash flow of CU100 in 5 years' time measured at the pure, post-tax, rate of 7% which equates to a value of CU71.3, less present value of the tax benefit (effective inflow) at a pure rate of 7% equates to a value of 21.4, giving net value of 49.9. Alternative way of calculating the value is as present value of future net (post-tax) cash flow of 70 at the pure, post-tax, rate, which also gives CU49.91, or as pre-tax cash flow of CU100 discounted at a pre-tax rate of 14.92%, again resulting in CU49.91.
- A9. So, what is the problem?
- A10. Even though the values of the two liabilities are different, it is likely that entities applying IAS 19 would use the same rate for their measurement.¹³ This is because IAS 19 requires entities to determine rate to use in present value calculation with reference to observed (pre-tax) rate on the bonds. IFRS provides no guidance on adjustments if the tax cash flows for the bonds do not match the tax cash flows for the pension liability. It is possible that the use of the words 'with reference to' can be interpreted to mean that tax can be adjusted for but at the moment our understanding is that this does not happen in practice. This would mean that pension liabilities in jurisdictions with different tax treatments are not comparable. We are still investigating what happens in practice.
- A11. In our example, we have assumed that the bonds, whose rate is used as reference for the calculation, are taxed in the same way as Liability 1 (ie tax is payable on interest as accrued). So using the pre-tax rate for bonds for the measurement of liability 1 is fine. The issue is that the same rate would be used for the measurement of liability 2 in our example, which has different tax pattern. In our example, we have calculated that the pre-tax rate of 14.9 per cent should apply to Liability 2 and not the rate of 10

¹³ Because IAS 19 requires a specific reference rate, the measurement would never be the same as true economic value, this example only focuses on comparability of liabilities from the tax aspect.

per cent which would be the pre-tax rate observed for bonds and the pre-tax rate for Liability 1.

- A12. Some of this comparability problem goes away with application of IAS 12, which would require a deferred tax asset to be recognised for Liability 2 – therefore reducing the net liability. This deferred tax asset would be recognised as 30 per cent (the assumed tax rate) of the carrying amount of the liability (CU62), ie CU18.6. The deferred tax asset can also be calculated as the present value of the future tax deduction of CU30, discounted at the same rate. Consequently, this shows that the deferred tax asset in this case automatically reflects the time value of money, because a percentage of a present value is a present value. Unfortunately some investors tell us that they adjust all deferred tax assets to reflect time value of money, under assumption that all deferred tax assets are undiscounted. This means that the deferred tax asset is understated and the liability overstated.
- A13. Another issue is that the net value of Liability 2 that we would recognise by applying IAS 19 and IAS 12 is CU44 (CU62 – CU18.2) and not CU49.9, which we calculated is its value in the example in the table above. Consequently, the net liability is understated (even before the investors' adjustment). This happens because we have already taken into account some of the tax effect in the measurement of the liability in accordance with IAS 19 at CU62 (we calculated the true pre-tax value of the liability as CU71.3 in the example). So IAS 19 measurement reflects some of the tax benefit. We then recognised the full tax benefit again through deferred tax as per IAS 12. We are therefore recognising too much tax benefit.
- A14. If we were to recognise the Liability 2 at its true pre-tax amount of CU71.3 (by using post-tax rate of 7% and applying it to net (post-tax) cash flow of 70, or by using calculated pre-tax rate of 14.9% and applying it to gross (pre-tax) cash flow of 100) and then recognise a deferred tax asset of CU21 (30 per cent of CU71.3) we would arrive at the true net post-tax liability of CU49.9. But this does not happen when applying IAS 19 and IAS 12.
- A15. Similar issue occurs when applying IAS 37, which requires the use of pre-tax rates (which result in a measurement that reflects some or all of the tax benefits) and can also trigger recognition of deferred tax when required by IAS 12. Similarly to IAS

19 example, tax effects can be double-counted in some scenarios. As most long-term liabilities in the scope of IAS 37 attract tax benefits only when cash flows are paid, and therefore result in recognition of deferred tax asset, most IAS 37 liabilities end up being understated due to overstatement of deferred tax. Unlike pensions however, long-term provisions are significant only in few industries.

Appendix 3 – List of contents

Contents

Introduction.....	1
Further research—Components and methodology	3
Present value measurement components	3
Entity versus market perspective.....	4
Potential issues to be considered	7
Individual components of present value measurement.....	8
Estimate of cash flows.....	9
Possible variations in estimated amount and timing of cash flows	9
Profit margin.....	10
Potential issues to be considered further	10
Time value of money.....	11
Time value of money in practice	11
Potential issues to be considered further	12
Risk premium	12
Practice	13
Potential issues to be considered further	13
Liquidity risk.....	13
Practice	15
Potential issues to be considered further	16
Own credit risk.....	16
IASB Discussion Paper on credit risk	16
IAS 37 and credit risk.....	17
Potential issues to be considered further	18

Methodology	19
Adjustments to the rate vs cash flows	21
Potential issues to be considered further	21
Tax.....	21
Conversion from post-tax to pre-tax rates.....	22
Potential double-counting of tax effect	23
Potential issues to be considered further	24
Inflation	25
Other methodology considerations	25
Which date for the rate	25
Top-down vs bottom up.....	26
Use of yield curves	26
The way forward	27
Appendix 1 – present value measurement guidance included in IFRS 13.....	29
Present value techniques	29
The components of a present value measurement	29
Appendix 2 – Risk-free rates used in 2015 – academic research findings.....	33
Appendix 3 – interaction of discount rate and taxes	34

List of tables:

Table 1 Entity versus market perspective	6
Table 2 Components of present value measurement in various Standards	8
Table 3 Use of term ‘time value of money’ in IFRS	11
Table 4 Present value measurement methodology in current present value measurements 20	
Table 5 Tax permutations	23