

# VALUE WORKING GROUP REPORT

This report represents the work of the Value Working Group of the Board for Actuarial Standards.

The Group was established to assist the BAS to consider matters relevant to the calculation of value, in its development of a conceptual framework. Details of the Group's terms of reference and membership are given in Appendix D.

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# 1 What is actuarial work?

## Scope of actuarial work

- 1.1 One issue facing the BAS and the Group is that there is no widely accepted definition of “actuarial work”, nor is there general understanding of what distinguishes the various activities that are undertaken in actuarial work.
- 1.2 It is suggested that actuarial work is mainly concerned with the study of future cashflows arising from the ownership of assets and/or liabilities, where the amounts and timing are subject to significant uncertainty in one or more respects. For example, for pension schemes, the main areas of uncertainty about future payments of benefits and cashflows from contributions and investment activities are mortality, investment returns, pay increases and inflation.
- 1.3 Actuarial calculations are traditionally called valuations and the results are referred to as values. Actuarial valuations typically establish value from a consideration of the cashflows. Mathematical and statistical concepts and techniques are used to determine appropriate assumptions and to convert the cashflows into a resultant value.
- 1.4 The insurance and pensions industries (and the actuaries who work in them) were the first to rely on the dominant use of statistical concepts and techniques, including the practical application of probability theory. Actuaries predominantly operate in these areas but are increasingly being employed in banking and finance as these areas extend their use of similar techniques.

## Areas of actuarial work

- 1.5 The main areas of actuarial work and the major causes of uncertainty in each area are:
  - defined benefit pensions – where the dates of future payments depend on when the pensioners die, the amounts depend on salary increases and inflation and funding also depends on investment returns;
  - money purchase pensions – where projections of emerging benefits depend upon the above factors, together with the cost of purchasing annuities at retirement;
  - life insurance – where the dates of future payments depend on when the policyholders die and the amounts may depend on future investment returns;
  - health insurance – where the dates of future payments depend upon the incidence of ill health and the amounts are related to the treatments required;
  - general insurance – where the numbers, timing and amounts of claims payments are variable.
- 1.6 Actuaries also work in the fields of investment, asset management, corporate finance, banking and risk management.

## **Purposes of actuarial work**

- 1.7 Most actuarial work is concerned with the assets and liabilities of an entity (such as a pension fund or insurance company). The assets and liabilities are usually a combination of those already in existence (e.g. investments and pension liabilities for past service) and those which will arise in future (e.g. pension contributions and pension liabilities for future service). Actuarial work evaluates the liabilities and the adequacy of the assets to meet them. This work comprises the provision of information and advice on the consequences of that information.
- 1.8 At the core of actuarial work is actuarial valuation work. This is intended to:
- express a series of future cashflows as a single figure or range of figures (this being described as valuation work); and/or
  - provide the information needed for economic decisions related to a series of future cashflows.

1.9 These purposes of actuarial valuation work are illustrated in the following table which covers the main areas:

<b>Purposes of actuarial valuation work</b>			
<b>Main area of work</b>	<b>Nature of future payments</b>	<b>(a) Purposes of valuation</b>	<b>(b) Types of economic decisions</b>
Pensions	Pensions for past service	Financial statements, solvency/adequacy of assets, regulation	Funding of surplus/deficit, cash commutations, risk transfer to third parties, sales of businesses including their pension funds.
	Pensions for future service		Contribution rates, alterations to scheme benefits.
Life insurance	Claims on existing policies	Financial statements, embedded values, solvency/adequacy of assets, regulation	Capital injection, bonuses, dividends, division between different stakeholders, surrender values, sales of policies in force, appraisal value, sales of businesses.
	New policies	Adequacy of assets, regulation	Premium rates, alterations to product offerings, new products.
General insurance	Claims on existing policies	Financial statements, solvency, regulation	Capital injection, dividends, transfers/securitisation, reinsurance, sales of businesses.
	New policies	Adequacy of assets, regulation	Premium rates, alterations to product offerings, new products.

## Outputs of actuarial work

1.10 As an alternative perspective, the outputs of actuarial work may be grouped under the following captions, which span all areas of actuarial practice:

<b>Outputs of actuarial work</b>	
<b>Output</b>	<b>Description</b>
Market consistent value	Assessment of the price at which goods would change hands for in the open market.
Value relevant information	Not market price, but information used by the market in the determination of price (e.g. financial reporting).
Prudential information	Information prepared on a measurement basis specified by a prudential regulator.
Cashflow projection	Any exercise (other than the above) whose substance is concerned with projection of future cashflows, based on assumptions including assumed rates of investment return if investments are held.
Solvency measurement	A measure of the extent to which an entity has the necessary financial resources to settle its liabilities in the cheapest manner in which they could be currently settled (if any). As an alternative, a measure of the extent to which an entity could secure sufficient assets to cover all its liabilities with exposures to relevant risks being removed to the greatest possible extent.
Regulatory capital assessment	An assessment of the necessary capital required by the prudential regulator.
Risk assessment	An assessment of the probability that an entity will not be able to meet its liabilities as they fall due.
Distribution assessment	An assessment of the extent of distribution (bonus/dividends) to shareholders and policyholders that may be made.

## 2 Cashflows and uncertainty

**Cashflows - Financial products studied by actuaries generally produce a series of future cashflows. Analysis of these cashflows (and the factors on which they depend) can provide valuable insight for valuation, risk management and planning purposes. (Concept)**

- 2.1 As noted in paragraph 1.2 above, actuarial work is concerned with the study of cashflows and thus financial products that are studied by actuaries need to be expressed in cash terms. The term “financial product” can be used very broadly. Alternative terms might be good, or business. Examples of this broad usage include:
- a life insurance policy (or portfolio of policies) which may result in future claim payments;
  - a fire insurance policy (or portfolio of policies) which may result in future claim payments;
  - a pension fund’s obligation to pay pension benefits (cashflows comprise the future benefit payments).
- 2.2 Utility is defined as the usefulness or satisfaction that an individual or entity derives from goods. Each individual or entity will also attach a level of utility to money, which will usually depend on their available monetary wealth. Individuals will be expected to buy goods whose utility is greater than the utility of their monetary price and sell goods whose utility is lower. Money enables the value of goods to be measured on a common basis with a defined metric (unit of measurement).
- 2.3 The need to express the utility of, say, an asset in monetary terms, as cash payments or receipts at certain dates, is both a practical requirement but also less harsh a discipline than might appear. The ownership of a house might appear at first sight to convey various intangible benefits which were hard to put a value on, such as its south facing view, its excellent location, the quality of its soil and so on; but the conclusion of a market transaction to purchase the house brings home the fact that buyers and sellers place a monetary value on such attributes. Equally, though, every owner or potential owner will place his own personal figures on those attributes, expressing what they are worth to him as an individual.

**Risk – An essential feature of future cashflows is that their amount, timing and frequency of occurrence may be unknown. (Concept)**

- 2.4 Obviously, there is nothing certain about the future. Even the rising of the sun tomorrow morning depends on a continuation of the solar system for the next few hours.
- 2.5 As previously noted, actuarial work is mainly concerned with the study of future cashflows, where the amounts and timing are subject to significant uncertainty in one or more respects. Providers and consumers often prefer more certainty than is really available and there is a natural tendency to underestimate the

likelihood of extreme events, especially adverse ones, and sometimes to refuse to countenance such possibilities at all.

- 2.6 Information on financial products, with uncertain cashflows is necessary to help consumers understand their nature. Traditionally the information provided has concentrated on the average expected outcome. For example, a life company may illustrate future policy values (“save £20 a month and receive £53,144 at age 65”). However, it could be argued that there is also a need to clarify the extent to which experience may differ from the expected outcome.
- 2.7 Not only is there uncertainty about future cashflows, but there is also uncertainty about the various possibilities that may arise, i.e. uncertainty about the range of uncertainty. This differs from, for example, the throw of a pair of dice, where it is known that the chance of a double six is 1 in 36, or just under 3%. Future cashflows may be subject to uncertainty to a degree which is impossible to quantify. While statistics of what has happened in the past are useful, they are not a complete guide to the future and the more extreme outcomes are the least likely to be repeated or predictable.

### **3 Definition of key terms**

**“When I use a word”, Humpty Dumpty said in a rather scornful tone, “it means just what I choose it to mean – nothing more nor less” *Lewis Carroll***

- 3.1 Clarity in actuarial discussions is often hampered by a lack of definition of key terms. One particular bugbear is the term “actuarial valuation”. In the past an actuarial valuation of a pension scheme was aimed at estimating future cashflows, including contributions, and an actuarial valuation of a life insurance business was concerned with determining an orderly release of surplus for bonus declarations: in both cases the determination of a capital figure, or value, for future cashflows was of less or no significance. For many years an actuarial valuation of assets was taken to be a figure attributed to them, by an actuary, which might well differ from the assets’ market value. The actuarial valuation had regard, usually, to income flows and a capitalisation rate and its key relevance was in the relationship between that figure and the value of the liabilities determined on a consistent basis.
- 3.2 A different use of the term appears in the Pensions Act 2004. An actuarial valuation in that context is “a written report, prepared and signed by the actuary, valuing the scheme’s assets and calculating its technical provisions”.
- 3.3 The above example illustrates the importance of avoiding ambiguity in the use of key terms. A list of key terms used in actuarial practice, and of their definitions, is included at Appendix A.

**Value - A series of future cashflows can be expressed in terms of a value at a given date. (Concept)**

**Outcome Range - Where the cashflows can vary, information can be provided on the potential variation by showing the expected range of outcomes for a given probability interval. (Concept)**

**Sensitivity – Where the cashflows can vary, due to certain factors, and for the purpose of actuarial valuations assumptions are made about these factors, information can be provided on the sensitivity of the results (to the assumptions)**

**by showing the extent of change in the result for a given change in an assumption. (Concept)**

- 3.4 We have set out, above, drafts of three concepts for discussion.
- 3.5 Two key terms relevant to the discussion of actuarial valuation are **valuation** and **value**. Valuation is considered to be the process of determining a value and not the result of that process. When one asks a surveyor, an investment banker or an actuary to carry out a valuation, one is commissioning an exercise. That exercise is a valuation and, while the process is of course of interest, it is the value that emerges from it, and the accompanying information, that represents its outcome.
- 3.6 The term value has proved harder to pin down. In part this reflects a bigger issue the Group has debated, i.e. whether actuaries should be solely concerned with the values at which assets or liabilities did or would change hands in the market; or whether there are other forms of value that should concern them. Unfortunately the plurality of meanings given to the word “value” runs the risk of causing ambiguity or imprecision in its usage. Notwithstanding the overall desire to use words in their everyday meaning the Group recommends that:
- wherever possible, the word value is preceded by a descriptive qualifier (e.g. market value, book value etc);
  - when used as a verb, it means carry out a valuation in order to determine a value.
- 3.7 Some feel that that the word value, whether qualified or not, is in danger of being misleading because value to many people (pace Oscar Wilde, see paragraph 5.1) means the price at which something changes hands in an open market. A possible response to this would be to avoid the use of the word value and to refer to actuarial assessments, valuation amounts, or some such term.
- 3.8 There are a variety of views. Although some feel that value can have a multitude of meanings (if qualified by a descriptive adjective), there are others who believe that actuaries should determine what they believe value to represent. Most of these would accept that terms like “book” value exist in accounting and cannot be removed by actuaries. However, the real question is whether value has a meaning in itself and should be objective, or whether for actuaries the descriptive adjective is really a full description of the methodology and the assumptions, so that, provided this is disclosed, with the assumptions themselves, the meaning of value is unconstrained.
- 3.9 Thus, if it has no qualifier before it, the term value means simply the outcome of a valuation. It may be expressed as a single number, or as a range of numbers, and if the latter the range may be accompanied by probability estimates. In clarifying what the word means in the actuarial context, this definition allows one to progress to examining the need to identify the different types of value and to set standards for their determination.

## **4 Components of value and its assessment**

**Components - The components of a valuation, each of which needs to be considered and determined in order to arrive at a value, are quantum (of**

**cashflows), time, payment risk and preference and, in the case of a provider, risk capital cost. (Concept)**

- 4.1 As already noted, where value has to be computed it is based on the conversion of a series of future payments into a single figure or range of figures.
- 4.2 For this purpose a valuation brings into play a number of components, differing slightly between consumers and producers:

<b>Consumer/Risk transferor/ Policyholder</b>	<b>Producer/ Risk acceptor/ Insurer</b>
Quantum	Quantum
Time	Time
Payment Risk	Payment Risk
Preference	Preference
	Risk Capital Cost

- 4.3 **Quantum** represents the monetary amount of each element of the separate cashflows being valued. These may include elements which require the triggering of an option to make them occur.
- 4.4 **Time** concerns the “time value of money” (from the date of measurement until the future times at which the payments arise).
- 4.5 **Payment risk** is the probability of each of the various possible quanta of the cashflows. A discussion of risk is included at Appendix B.
- 4.6 **Preference** represents the human preference for certain things compared to others, for example certainty and marketability. There is a general human preference for certainty and security with the result that an asset or liability that can provide this is likely to be preferred to an asset or liability (with the same average expected outcome) which is less able to do so.
- 4.7 An entity may be able to utilise diversification to reduce the dispersion of the payment risk from a portfolio of a number of similar financial products. An entity may also have different preferences due to the availability of risk capital. Some further aspects of preference are discussed in Appendix C.
- 4.8 If **risk capital** is held by an entity, it will wish to achieve a return to service that capital. This return represents a component of the value (cost) to the entity.
- 4.9 The market reconciles these separate perspectives to provide a balanced view of market value. It is evident from the observation of market values that the views of market participants vary constantly.
- 4.10 These two sets of components provide a suitable structure around which to debate the meaning of value when seen as *worth*, and are also likely to be a reasonably suitable structure around which to debate the meaning of other definitions of value.

## Assessment of value

- 4.11 Value may be assessed objectively using either the consumer or the producer set of components. An objective assessment of value must address each of the relevant components and must do so in a manner that is consistent with the reality of natural conditions and human preference. A market consistent basis of assessment is a widely understood approach to such an assessment. Nevertheless, as discussed above, valuations (or actuarial assessments) may be commissioned for various purposes which are not consistent with market prices, or which apply in a field where there is no deep and liquid market to provide valid reference points for the valuation.

## 5 Worth and market value

**“A cynic is a man who knows the price of everything and the value of nothing”**  
*Oscar Wilde*

### Market value as the only value

- 5.1 A number of commentators suggest that market value or market consistent value should be the only reference point (as opposed to the alternative view that value depends on the purpose for which it is determined). A discussion of market values and of worth is therefore relevant.

### The significance of market value

**Markets - Markets exist to enable participants to exchange goods. A well functioning market enables a holder of a good to exchange it with someone whose estimate of value for his purpose is higher. (Concept)**

- 5.2 Markets may be regarded as a forum for the exchange of goods. The medium used for these exchanges is generally money (barter is rare and may be ignored), and the prices at which transactions take place are called the market prices. From the occurrence of market transactions it may be concluded that:
- buyers will buy a good if they value it more than the monetary cost of its purchase; and
  - sellers will sell a good if they value it less than the monetary proceeds from its sale.
- 5.3 The value that buyers and sellers place on both goods and money for such purposes is generally regarded in economics as worth or utility.
- 5.4 Markets enable the exchange of a variety of goods. Some are purchased out of necessity, for example food. Others are purchased with the intention of making money through commercial production (for example production equipment), making money through investment (for example a share), or avoiding a financial loss (for example an insurance policy).
- 5.5 In investment markets, many practitioners are involved in assessing the value of a potential investment, without at first referring to the market price (if any is available). Value in these circumstances is recognised to be in the eyes of the beholder. For clarity, the term worth, or utility, may be used in order to

distinguish it from 'market value'. Worth/utility is specific to a particular investor, or group of investors.

- 5.6 Market values are often regarded as objective on the grounds that they show the monetary price at which a transaction could be achieved. However, this objectivity may be overstated as the information generally relates to the price for previous trades of a particular quantity, and will not necessarily apply to a later trade, or for a different quantity.
- 5.7 Market prices are nevertheless the best information available on the potential monetary result of a transaction. Where market prices do not exist for the good in question a market price may be simulated using the market price of components or near substitutes. This is referred to as a market consistent price.
- 5.8 Pension liabilities are goods just as much as plants, businesses or shares in companies. The investor in pension liabilities (typically the company sponsor of the scheme) must form his own view of the worth of those liabilities in his particular circumstances (which includes the value of the pension scheme to his business), and is concerned with his particular returns on the funding needed. Another investor in the same pension liabilities, such as an insurance company acquiring them, will have a different view of the components of the value and consequently of the worth of those liabilities.

## 6 Purpose-specific value

**Purpose - The basis on which value is determined depends on the purpose for which it is required. Any use of the term value should make this purpose clear. (Principle)**

- 6.1 The alternative to regarding market value as the dominant philosophy is to accept that a good, financial product, or collection of liabilities, can have a number of different values, which vary according to the purpose for which the values are required.
- 6.2 A good illustration of the diversity of purpose-specific values is found in the defined benefit pensions field, where a valuation may be commissioned to arrive at any of the following values:
  - (a) **A value for specific scheme funding purposes.** Scheme documentation or the decisions of the trustees may dictate specific funding objectives which differ from those under the statutory scheme funding rules. For example, the objective might be a 60/40 outcome – the assumptions are set with the aim that the eventual cost is 60% likely to be less and only 40% likely to be more than the estimated worth. The extent of such requirements will vary from case to case but could require a variety of types of valuation, and may indicate that certain levels of anticipated investment returns are to be allowed for. It is natural to have regard to the likely returns from the fund's chosen asset mix. Typically the assumptions used to derive a value for funding purposes, such as the value of a pensions deficit, or the value of accruing pension liabilities, will include a margin of prudence compared to the assumptions used to derive a value for forecasting purposes.
  - (b) **A value for statutory scheme funding purposes.** Scheme funding under the Pensions Act 2004 (by Government as the "primary regulator") is a

regime that regulates the minimum level of contributions to a UK pension scheme. As part of this it prescribes the calculation of the value of a scheme's liabilities (called technical provisions) based on prescribed principles.

- (c) **A value for forecasting purposes.** This is the central outcome – the expected costs, in terms of the assets that the fund should hold, using even-handed or best estimate, assumptions about investment returns, real interest rates and longevity. Funders, trustees, employers and insurance companies, will often require a best estimate of the likely outcome of their funding and investment programmes. Companies may not always be given this figure. It is important because it represents the average, or mean, of the range of possible answers to the question – what level of assets will be just sufficient to meet its current liabilities? It is the best estimate of the worth of the pension liabilities.
- (d) **A value for solvency purposes.** Solvency requirements are generally specified by regulation (through Government as the “primary regulator”) and are commonly designed to test and demonstrate a standard of safety. Thus a risk free rate is often regarded as appropriate for the discount rate for a solvency calculation. For example the UK Government has specified that pension scheme solvency should be assessed by considering market insurance (“buy-out”) costs.
- (e) **A value for PPF deficit calculations.** The PPF (Pension Protection Fund) is a financial institution created under the Pensions Act 2004 to provide compensation to members of failed pension schemes. Its finances are provided by a levy on pension schemes which includes a risk based element. The PPF, as the primary regulator, has issued guidance for the valuation of the compensation benefits it provides. This Section 179 valuation is a buy-out basis aiming to track the buy-out market. It should be noted that this valuation is valuing the compensation provided by the PPF (in respect of scheme benefits) rather than the scheme benefits themselves.
- (f) **A value for transferring risk from one counterparty to another.** Financial economics would define the market value of liabilities as that value at which the liability can be transferred from one counterparty to another (each counterparty being sufficiently skilled and knowledgeable). In the pensions context, this value is known as the buy-out value. As a value at which a trade could be made, the buy-out value has a number of characteristics including the buyer's and the seller's appraisal of risk, and liquidity risk (in the absence of a deep market). The buy-out value is market consistent.
- (g) **A value for accounting purposes.** Financial reporting requirements are generally specified by accounting standard setters as the “primary regulator”. In the UK FRS17/IAS19 now require pension fund liabilities to be disclosed and the surplus or deficit to be shown on the balance sheet. For both standards the discount rate to be used should be consistent with high quality corporate bonds, which incorporates some degree of credit risk into the calculation (the degree of risk being determined by the spreads in the market at the time of calculation).

- 6.3 The illustration below shows the contrast between some of these bases of valuation and highlights the tension between them if the clear differences between their purposes are not understood.

*Illustration – In the context of the financial considerations for a pension scheme a finance director may ask his actuary for advice on a best estimate, a prudent assessment and an accounting estimate of the amount required to cover the benefits provided. His actuary provides three different figures in response to the three different questions posed:*

- *His best estimate of the amount required, based on the most likely return on the scheme assets - £10m.*
- *His “prudent” assessment (adding something for caution) - £11.5m. Best estimates of investment returns have been shaded down and estimates of future salary growth have been shaded upwards, to reach a prudent estimate of the contribution required.*
- *The accounting cost that will appear in the financial statements for this year’s pension commitment - £14m. This uses a rate of return/discount rate linked to the bond market and consequently arrives at a higher value. Thus the financial statements will show a deficit of £2.5m on the year’s pension funding even though the company contributed more than was required, using a best estimate.*

*After some years, the fund has accumulated assets of £300m and the values of the benefits accrued to date on the three bases are: best estimate £280m; funding assumptions £310m; financial statements £350m. The difference between the best estimate and the financial statements figure, of £70m, is the difference which is expected to emerge over the years (ignoring the effect of further accruals of liabilities for future service). In the meantime, the company’s financial statements have recorded a cumulative actuarial deficit of £50m compared to the surplus of £20m which would have emerged using best estimate assumptions.*

- 6.4 Consequently the Group considers that a value determined by an actuary must be accompanied by a clear statement of its purpose as well as of the key assumptions that have made to meet that purpose. In the absence of such a statement many users will believe that a value means a market consistent value, or market price; while this will sometimes be the case it often will not and no room should be left for doubt.

## **7 Allowance for risk**

- 7.1 Any valuation to arrive at value is subject to a range of risks/uncertainties. Risks relate to areas of uncertainty where the actual outcome will differ, either beneficially or adversely, from the prediction. Risks relate to:

- cashflows – for example, longevity of the pensioners, pension levels, annual pension increases, timing of all cashflows; and
- investment returns – the rate of return on the financing assets, where these are to be allowed for in the calculated value.

- 7.2 Actuaries increasingly display risk by portraying the range of possible future outcomes and the probability that the actual outcome is above (or below) any given figure<sup>1</sup>.

## **8 BAS principles and standards and the work of other competent authorities**

- 8.1 The BAS works alongside a number of other regulators and standard-setters. Among these are:

- the Financial Services Authority, whose statutory objectives relate to market confidence, public awareness, consumer protection and the reduction of financial crime;
- the Pensions Regulator – which is working to improve confidence in work-based pensions by protecting members' benefits and encouraging high standards and good practice in running pension schemes;
- the Financial Reporting Council (of which the BAS is an operating body, as is the Accounting Standards Board) – the UK's independent regulator responsible for promoting confidence in corporate reporting and governance;
- the Department for Work & Pensions;
- the Pension Protection Fund, which was established to pay compensation to members of eligible defined benefit pension schemes, when there is a qualifying insolvency event in relation to the employer and where there are insufficient assets in the pension scheme to cover Pension Protection Fund levels of compensation;
- the International Accounting Standards Board, which is committed to developing, in the public interest, a single set of high quality, understandable and enforceable global accounting standards that require transparent and comparable information in general purpose financial statements;
- European regulators.

- 8.2 There will be occasions where territory is common to two or more of the bodies concerned. Under such an approach the BAS will need to have constructive and open dialogue with other standard-setters and regulators on matters of mutual interest. The overall aim of the BAS is to establish and improve actuarial standards, primarily of a technical nature, to ensure that they are coherent, consistent and comprehensive, and thereby to help promote high quality actuarial practice.

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<sup>1</sup> An important criticism of actuaries' probability distributions in relation to pension liabilities is that they usually only encompass the uncertainty relating to the investment return on the funding and not the uncertainties about longevity, salary increases and inflation. Funding pension liabilities with bonds largely removes investment return uncertainty but does nothing about the other uncertainties. Liability driven investment seeks to match economic factors but, in the absence of a market in mortality, cannot hedge longevity risk. .

## 9 Harmonisation of life, general and pensions

- 9.1 The main current priority of the BAS is to develop a conceptual framework of the concepts and principles underlying actuarial work. It is implicit in this that the framework will apply equally to all areas of actuarial work. Hitherto it has been considered that life insurance, pensions and general insurance actuaries live in different worlds and work according to different rules. Clearly, if the concepts underlying actuarial work are valid in themselves, they should apply across all fields of actuarial practice. And they should be consistent with the concepts and principles underlying financial reporting and the regulation of financial activity.
- 9.2 An implication of this is that the calculation of value for a particular purpose in one area (for example, pensions) must be the same as the calculation value for the same purpose in another area (for example, life insurance).
- 9.3 The apparent contrast between life, pensions and general is illustrated by considering how an actuary in each field would currently value a liability due to be paid in ten years' time; for example, if the borrower were to incur a liability of 100, free of interest, which he used to invest in a house that he expect to double in value over those ten years. The answers each might be expected to give could be:
- Life – discount the 100 by the risk free rate of interest (5%) over ten years – 61.
  - Pensions – discount the 100 by the investment return (100% over ten years, ignoring income and running costs) expected on the financing asset<sup>2</sup> - 50.
  - General – apply no discount as ten years are a long time and the lack of a discount compensates for uncertainty – 100.
- 9.4 Are there genuinely purpose-specific differences to justify the different approaches or should they be harmonised in the future (and, if so, on what basis)?
- 9.5 The life actuary is concerned with valuing payments to be made when policyholders die (we are concerned here with the pure life insurance aspect of the business rather than the savings element of endowment policies) as well as with annuities which are paid if people live. The investments held by the company to match its pure life liabilities are typically low risk investments such as gilts, in order to remove investment risk from the company's profile. This leaves mortality risk as the primary financial risk borne by a life company, i.e. the adverse risk that its policyholders will die earlier than expected (the opposite of the adverse risk to which a pension fund is exposed). If the life company has surplus capital, in excess of that needed to meet its known liabilities, it may invest this in riskier assets such as equities, but these are not regarded as the assets backing its obligations to insured persons for the pure life element of their insurance.
- 9.6 The pensions actuary may well use an expected return on assets to discount future payments for certain valuation purposes. Pensions fund invest in a wide

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<sup>2</sup> The calculation is  $100 * 1/(1+100\%)$ , i.e.  $100*1/2$ , i.e. 50

range of assets to provide the funds to pay their liabilities, backed by the obligation of the sponsoring company to make good any deficiency. As shown in paragraph 6.2, other purposes will dictate the use of a corporate bond rate, a gilts rate or a variant of those.

- 9.7 The general insurance actuary has typically not discounted the amounts of future payments and has regarded this as additional cover against the uncertainty, in both timing and amount, of payments which will not be made for some years into the future. This approach is now under close examination by the IASB, who consider that in principle discounting is required and that uncertainties about cashflows should be reflected in the projection of those cashflows and not by an absence of discounting.
- 9.8 On examination, therefore, it may be concluded that the differences between the three branches of actuarial practice are not as wide as they have been portrayed.

## **10 Emerging concepts and principles**

10.1 This section draws together the draft concepts and principles set out earlier in this document.

**Cashflows - Financial products studied by actuaries generally produce a series of future cashflows. Analysis of these cashflows (and the factors on which they depend) can provide valuable insight for valuation, risk management and planning purposes. (Concept – paragraph 2.1)**

**Risk – An essential feature of future cashflows is that their amount, timing and frequency of occurrence may be unknown. (Concept – paragraph 2.4)**

**Value - A series of future cashflows can be expressed in terms of a value at a given date. (Concept – paragraph 3.4)**

**Outcome Range - Where the cashflows can vary, information can be provided on the potential variation by showing the expected range of outcomes for a given probability interval. (Concept – paragraph 3.4)**

**Sensitivity – Where the cashflows can vary, due to certain factors, and for the purpose of actuarial valuations assumptions are made about these factors, information can be provided on the sensitivity of the results (to the assumptions) by showing the extent of change in the result for a given change in an assumption. (Concept – paragraph 3.4)**

**Components - The components of a valuation, each of which needs to be considered and determined in order to arrive at a value, are quantum (of cashflows), time, payment risk and preference and, in the case of a provider, risk capital cost. (Concept – paragraph 4.1)**

**Markets - Markets exist to enable participants to exchange goods. A well functioning market enables a holder of a good to exchange it with someone whose estimate of value for his purpose is higher. (Concept - paragraph 5.2)**

**Purpose - The basis on which value is determined depends on the purpose for which it is required. Any use of the term value should make this purpose clear. (Principle – paragraph 6.1)**

## Appendix A (paragraph 3.3)

### Glossary of Terms used in Actuarial Practice (relevant to the VWG)

<b>Insurance/ Actuarial Term</b>	<b>Description</b>
Actuarial Valuation (insurance company)	<p>An actuarial valuation of an insurance company may be undertaken for a variety of purposes. These include determining:</p> <ul style="list-style-type: none"><li>- the level of capital required for prudential purposes</li><li>- the rate of bonuses that can be awarded consistently with the desired bonus philosophy.</li></ul> <p>These actuarial valuations may be regarded as financial reports/assessments.</p>
Actuarial Valuation (pension scheme)	<p>A financial report/assessment performed by an actuary for any purpose specified by the commissioner of the valuation.</p>
Actuarial Value	<p>The use of this term is not recommended. It is a term usually applied to one method of valuing the assets of a pension scheme, other than at their market price, by discounting estimated future cashflows at a rate consistent with the valuation of the liabilities of the scheme.</p>
Appraisal Value	<p>For an insurance company, this consists of the sum of:</p> <ul style="list-style-type: none"><li>- Shareholders' funds</li><li>- Embedded value</li><li>- Goodwill (in respect of the value that the market would attach to the entity's profits from future sales).</li></ul>
Asset	<p>A right or other access to future economic benefits controlled by an entity as a result of past transactions or events.</p>
Commutation Value	<p>The cash value given to a pension scheme member (usually at retirement) in exchange for pension benefits.</p>
Embedded Value	<p>This relates to the existing contracts previously written by an insurance company and represents the excess of future premiums and investment earnings over future payments and costs. It is the assessed value of future shareholder profits that will emerge from the in-force business.</p>
Funding (Contribution) Rate	<p>A funding rate to a pension scheme represents the amount the trustees determine is required to meet the cost of current and past service pensions, usually following the receipt of a financial report provided by an actuary.</p>
Investment (Premium)	<p>Certain payments to insurance companies do not fall into the category of true premiums but are simply a commitment to make a specified level of regular saving. The contract with the insurer is simply an investment</p>

management arrangement whereby the amount invested, plus investment returns, less charges, is returned to the investor. Certain types of payments, for example those to with profit endowments policies, are of a mixed nature.

Liability	An obligation to transfer economic benefits as a result of past transactions or events.
Option Value	Certain insurance contracts may enable the member to exercise options on pre agreed terms at certain times and in certain circumstances. These terms may be financially advantageous to the policyholder.
Premium, Insurance Cost, Buy Out Cost	A premium represents an entry value, retail value or purchase price for a consumer. It can also represent the purchase of reinsurance by an insurance company, or the purchase of a bulk insurance policy.
Realistic Balance Sheet	<p>This is a financial report which takes:</p> <p style="padding-left: 40px;">Assets at market value</p> <p style="padding-left: 40px;">Liabilities to consist of policy:</p> <ul style="list-style-type: none"> <li>- asset shares,</li> <li>- option costs,</li> <li>- risk costs (net of derivatives)</li> </ul> <p>Prudential regulators often require assets to exceed the liabilities by more than the specified minimum amount.</p>
Reserve	A reserve is an insurance term for the net liability represented by the existing contracts previously written (the in-force business). It is calculated as the value of future payments and costs less the value of future premiums.
Solvency/ Security	<p>Solvency is a term that relates to the financial state of an entity. It may be used in a current context to mean simply that the assets of an entity exceed its liabilities, or in other words that it has positive capital. It could be used in a prospective context in respect of the likelihood that an entity remains solvent, in which case it needs to have a probability assessment and may be made on a conditional basis that is dependent on particular circumstances.</p> <p>Security is a related term and refers to the resources available to an entity to meet its commitments.</p>
Sterling Reserve	A term given to the reserve (sometimes called technical provision) necessary to cover liabilities other than unit-linked liabilities for unit-linked business.
Surrender Value	This is the price at which a policyholder and an insurance company may terminate a contract between them prior to its expiry date.
Transfer Value	The amount which the trustees of a pension scheme will pay to another pension scheme in respect of the transfer offer of a member's benefits.

Unit Reserve      A term given to the reserve (sometimes called technical provision) necessary to cover unit-linked liabilities.

## Appendix B(paragraph 4.5)

### Risk Classifications<sup>3</sup>

Risk is a topic that will arise frequently during the development of the conceptual framework. To avoid the potential misunderstandings that can arise from the inconsistent use of terminology it is proposed that the following definitions should be adopted on a temporary working basis, until such time as appropriate terminology is finalised. This terminology has been borrowed from that adopted by the FSA with two additions.

#### 1. Risk

Risk is a generic classification which simply describes the phenomena that the timing incidence and quantum of future events may be uncertain.

Risk may be divided between the following categories:

- State risks
- entity risk
- direct risks

#### 2. State Risks

State risks are defined for this purpose as all risks connected with a change in the financial and legislative structures of the State in which an entity operates. At its most extreme this could result in an overthrow of the government, the loss of all entitlement to asset ownership, or loss of acceptance of monetary value. Less extreme risks are a change in taxation or legislative regimes.

#### 3. Entity Risk

Entity risk concerns the risk associated with an entity's own capital, dividend and debt payments. This may well be influenced by the direct risks to which the entity is subject.

#### 4. Direct Risks

Direct risks concern the risks to which an entity is exposed. These can be subdivided into separate risks and for this purpose the FSA sub classification has been detailed below.

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<sup>3</sup> This appendix overlaps with issues considered by the risk group. The principle is that all risks should be included if they can be, and clear disclosure of risks included and excluded is required.

## 4.1 Credit Risk

Credit risk is incurred whenever a firm is exposed to loss if another party fails to perform its financial obligations to the firm, including failing to perform them in a timely manner. It arises from both on and off balance sheet items. For contracts for traded financial instruments, for example the purchase and sale of securities or over the counter derivatives, risks may arise if the firm's counterparty does not honour its side of the contract. This constitutes counterparty risk, which can be considered a subset of credit risk. Another risk is issuer risk, which could potentially result in a firm losing the full price of a market instrument since default by the issuer could result in the value of its bonds or stocks falling to nil. In insurance firms, credit risk can arise from premium debtors, where cover under contracts of insurance may either commence before premiums become due or continue after their non-payment. Credit risk can also arise if a reinsurer fails to fulfil its financial obligation to repay a firm upon submission of a claim.

## 4.2 Market Risk

Market risk is the risk that as a result of market movements a firm may be exposed to fluctuations in the value of its assets, the amount of its liabilities, or the income from its assets. Sources of general market risk include movements in interest rates, equities, exchange rates and real estate prices. It is important to note that none of these sources of risk is independent of the others. For example, fluctuations in interest rates often have an impact upon equity and currency values and vice versa.

*(Critics of the market based financial measurement of long term liability exposures generally argue that market value based measures should be replaced by cashflow based measures risk, and that market based risk should be restricted to cashflow risk).*

## 4.3 Liquidity Risk

*The risk that a firm, although solvent, either does not have available sufficient financial resources to enable it to meet its obligations as they fall due, or can secure such resources only at excessive cost.*

## 4.4 Operational Risk

*Operational risk has been described by the Basel Committee on Banking Supervision as "the risk of loss, resulting from inadequate or failed internal processes, people and systems, or from external events" (excluding credit, market, liquidity and insurance risk). Examples of operational risk include internal and external fraud; failure to comply with employment law or meet workplace safety standards; damage to physical assets; business disruptions and transaction processing failures.*

In *order* to understand its operational risk profile, a firm should identify the types of operational risk that it is exposed to as far as reasonably possible. This might include, but is not limited to, consideration of:

- a. the nature of a firm's customers, products and activities, including sources of business, distribution mechanisms, and the complexity and volumes of transactions;
- b. the design, implementation, and operation of the processes and systems used in the end-to-end operating cycle for a firm's products and activities;
- c. the risk culture and human resource management practices at a firm;
- d. expense management and the control of the operating expenses included in the pricing or provisioning; and
- e. the business operating environment, including political, legal, socio-demographic, technological, and economic factors as well as the competitive environment and market structure.

#### 4.5 Insurance Risk

*Insurance* risk refers to fluctuations in the timing, frequency and severity of insured events, relative to the expectations of the firm at the time of underwriting. Insurance risk can also refer to fluctuations in the timing and amount of claim settlements. For general insurance business some specific examples of insurance risk include variations in the amount or frequency of claims or the unexpected occurrence of multiple claims arising from a single cause. For long-term insurance business examples include variations in the mortality and persistency rates of policyholders, or the possibility that guarantees could acquire a value that adversely affects the finances of a firm and its ability to treat its policyholders fairly consistent with the firm's obligations. More generally, insurance risk includes the potential for expense overruns relative to pricing or provisioning assumptions.

#### 4.6 Group Risk

If a firm is a member of a group, it should be able to assess the potential impact of risks arising from other parts of its group as well as from its own activities.

## Appendix C(paragraph 4.7)

### Practical Adjustments for Risk Preference

1. The components of value are set out in section 4:
  - Quantum;
  - Time;
  - Payment risk;
  - Preference; and
  - Risk capital cost.
2. In practice preference is difficult to measure in isolation and is allowed for by adjustments to one of the other components. As a result some care is needed to determine whether different views on the components of value are actually different, or whether the differences simply represent the different ways in which preference is accommodated.

3. For example the conceptual structure of:

$$\text{value} = \text{quantum} \times \text{payment probability} \times \text{preference adjustment} / (1 + \text{discount rate})$$

may take two different forms in practice, due to the difficulty of measuring risk aversion (a form of preference). The two possibilities are:

(a)  $\text{risk adjusted value} = \text{quantum} / (1 + \text{risk adjusted discount rate})$

(b)  $\text{certainty equivalent value} = (\text{quantum} - \text{risk premium}) / (1 + \text{risk free rate})$

which are alternative ways of expressing the same concepts.

4. Although minor variations are possible in both these forms, the greatest possibility of confusion lies in the adaptation for preference. As preference encompasses the principle that entities are risk averse the appropriate allowance for the valuation of an asset is different from the valuation of a liability.
5. For an asset
  - $\text{risk adjusted discount rate is greater than the risk free rate}$
  - $\text{risk premium reduces the value (i.e. the premium is positive)}$
  - but for a liability
    - (a)  $\text{risk adjusted discount rate is less than the risk free rate}$
    - (b)  $\text{risk premium adds to the value (i.e. the premium is negative).}$
6. The risk premium attaching to a liability may be reduced if there is recourse to additional cash (such as deficit payments from a pension scheme sponsor) if the assets held prove to be insufficient.
7. The argument that an allowance should be made for risk aversion may therefore lead to the conclusion that assets should be valued by discounting at above the risk free rate, but that liabilities should be valued by discounting at below the

risk free rate. Where the risks of the assets offset those of the liabilities to any degree, the risk premia for both assets and liabilities are reduced. In the case of an exact match, no risk premia should be included.

8. The allowance for preference also reveals a common failing in valuation methodologies based on components. If both (a) and (b) above are correct, then:

$$\text{value} \neq \text{quantum} / (1 + \text{risk free rate})$$

However, as payment risk is calculated allowing for many separate contingencies it is easy to forget that an adjustment is necessary to allow for risk aversion.

## Appendix D

### Value working group – membership and terms of reference

Name	Title
Bill Abbott	International Actuarial Association
Mike Arnold (*)	Principal and Head of Life Practice, Milliman.
Guy Ashton	Managing Director, Head of European Company Research, Deutsche Bank
Nigel Bankhead (*)	Director, BAS
John Bannon (*)	Group Director, Liverpool Victoria
Stewart Calder (*)	Head of Life Actuarial and Actuarial Function Holder, AXA
Lawrence Churchill (L)	Chairman, PPF
Ruth Goldman	Head of Pensions, Linklaters
Nigel Green	Previously Director of Financial Control, Nestle
Pat Hakong	Head of Accounting Policy, Lloyds Finance & Risk Management
Chris Hitchen (*)	Chief Executive, Railways Pension Trustee Company Ltd (RailPen)
Malcolm Kemp (*)	Executive Director Quantitative Research, Threadneedle Investments
Andrew Lennard (O)	Research Director, ASB
Peter Tompkins (*)	Partner, PwC
James Tuley (*)	Chief Actuary, FSA
Phil Turner (*)	European Partner, Mercer Human Resource Consulting
Martin Weale	Director, National Institute of Economic and Social Research.
Martin White (*)	Actuary, Equitas

(\*) FIFA (Actuary)

(L) Group Leader

(O) Observer from the FRC

# Conceptual Framework – Terms of Reference for Working Groups

## 1. Introduction

### Background

The Morris review of the Actuarial Profession concluded that “a useful early step for the actuarial standard-setting body would be to set out an appropriate conceptual framework, which would include the explicit objectives and characteristics of technical standards”. This would be consistent with standard setters in accountancy, including the ASB in the UK, and with actuarial bodies in the US. Hence the first stage of BAS’s work will be to develop a “Conceptual Framework” of generic concepts, principles and limitations, which is intended to underpin all actuarial practice and ensure a transparent and consistent common purpose. Due to its nature, it should provide a relatively timeless set of principles which should guide how actuarial practice should be applied.

The framework will not itself be a standard (so does not need the precise scope appropriate to a standard). However, it will provide a framework that will guide the subsequent development of subject specific standards and should provide guidance to practitioners as to how subject specific standards should be interpreted and applied.

### Approach

It is important that the project is sufficiently wide to cover all matters that affect actuarial practice, including many that are naturally taken for granted. All such matters should be examined to consider whether they represent a generic actuarial principle.

Each generic principle should be:

- defined and documented to ensure clarity and transparency
- tested to ensure that it is not subject specific
- tested against comparable principles in other areas of financial reporting for consistency of approach and definition
- tested to ensure that they are consistent with the needs of the users of actuarial practice

Subject specific principles should be considered in a similar manner to help decide the most appropriate manner in which they can be incorporated into subsequent standards.

### Working Methodology

BAS staff believes that the use of working groups will be helpful to development of such a Conceptual Framework.

Working Groups (or advisory panels) are a standard working approach used by many of the FRC Boards. These enable a project specific group of individuals to be assembled who can contribute to the development of a new standard on an interactive basis. This should enable the generation, development and refinement of a number of ideas which can be presented to the responsible Board, with a wider range of advance input than would be possible using only FRC staff. This approach should also be helpful in reducing the number of new inputs encountered at the consultation stage and may well provide an insight into certain areas of objection.

In this case, the purposes of the Working Groups are to generate ideas for a draft Discussion Paper, to flush out practical problems that any framework ideas might cause, and (possibly) to share out the drafting work. A secondary purpose is to widen the consultation process and to establish a dialogue with users and other regulators. The intention is that each Working Group will be chaired by a BAS Board member and will include a wide mix of FRC staff, actuaries, other professionals, practitioners (in relevant work areas), users of actuarial advice and consumer representatives, totalling approximately 15 participants. We envisage that each Group will meet about [6 times] at monthly intervals, although this is naturally subject to the complexity of the issues we encounter.

**Classification of Issues**

In the development of the conceptual framework it may (or may not!) be helpful to classify issues into separate types. Although the primary purpose is to ensure that all matters are considered, the advantage of classification (which is not intended to be restrictive) is largely to assist grouping and presentation. At this stage four separate classifications have been proposed which are:

- Principles/philosophies
- Concepts
- Limitations
- Terminology

Whilst terminology may in itself not warrant inclusion in the resultant conceptual framework, it will act as a constant reminder that consistent terminology is a prerequisite of clear communication. For this reason the project should consider the existence, adequacy and appropriateness of terminology in all areas covered by the project.

Examples of the types of issue that may fall into each group are as follows:

(a) principles/ philosophies	This would include such items as the characteristics of actuarial reports, or the philosophy underlying the measurement of value.
(b) concepts	Concepts are likely to concern matters that are inherently related to judgemental issues such as prudence or materiality.
(c) limitations	There are certain limitations to actuarial measures which should be determined and clarified so that users of actuarial advice can readily understand the inherent limitations and hence extent of reliance that apply to any actuarial measures. For example political, fiscal and taxation stability are generally accepted to be matters that are accepted to be within the status quo rather than being approached from a risk perspective.

## 2. Objective

The objective for the working group is to develop and prepare material that will be used in a Discussion Paper on a Conceptual Framework for actuarial practice, and in doing this:

- Consider the working group’s “Primary Purpose” and matters that should be considered as having an impact on this. From this (together with any suggested issues or material presented by BAS staff) determine the range of subsidiary issues and questions that arise in relation to the Primary Purpose
- Identify and research the range of views that are held in respect of each of these issues.
- Consider for each issue whether it is appropriate for the Discussion Paper to
  - cover all views encountered or only a selection
  - make a preliminary recommendation and seek comments
  - ask for open views without expressing any preliminary view
  - seek further information about current practice (this should only be resorted to exceptionally, and the working group should generally gather such information during the development process).

Working groups should be aware that some parts of the overall project will be running sequentially and others will be running concurrently. For this reason there will be a need to identify dependencies with other areas and for the final presentation of material will need to be recombined in a logical structure. For this reason it is likely to be helpful if issues are divided into discrete blocks that could be reordered.

We expect that a discussion paper and/or other material will be presented by BAS Staff to provide background material to assist each Working Group to address the relevant questions.

# Value Working Group

## Primary Purpose

To determine the extent to which the measurement of value is part of actuarial practice, and the principles underlying the measurement of value

## Questions/Material presented by BAS staff

1. When actuaries provide information that contains monetary amount denominated in sovereign currencies are they providing statements of value (of assets, liabilities, capital) or is actuarial practice concerned with some other concept?
2. What are the underlying principles regarding these values/monetary amounts which states what they are intended to represent and how their measurement should be approached.

For example accounting has a concept of Fair Value (often referred to as market value) which takes the position that a good is worth what it can be sold for. Measurement of this is extended to a simulated market value in circumstances where there is no ready liquid market for the good in question. However, actuaries normally use estimated future cash flows as a basis for measuring a liability or, sometimes, an asset. Can we formulate general principles that govern the use of present value, especially when the amount of future cash flows, their timing, or both are uncertain? But more importantly is present value a different concept from value?

3. What are the nature and characteristics of money, its relationship with time, and its relationship with risk and profit? What are the implications of this for discounting in a measurement system of monetary values?
4. Is value an objective or a subjective measure (based on the perspective of the entity, or the purpose of the measurement etc)? What are the context limitations that affect the measurement of value/monetary amounts.
5. Are financial amounts presented in actuarial valuations subject to the same objectives as the measurement of value in financial accounts? If different how can the two different philosophies be sensibly combined in a composite report?
6. Should a present value measurement reflect the uncertainties inherent in the estimated cash flows and distinguish between items with different risks?
7. Actuarial applications of present value have typically used a single set of estimated cash flows and a single interest rate, treating uncertainties implicitly in the selection of a discount rate. However, there is increasing emphasis on explicit assumptions about the range of possible estimated cash flows and their respective probabilities, often by using a “stochastic” model to generate a set of economic scenarios, which may number several thousand scenarios. What is the objective, or objectives, of present value when it is used in measurements of assets or liabilities?

8. Do measurements of liabilities require different objectives, or present different problems, than measurements of assets?
9. How should estimates of cash flows and interest rates be developed?
10. The present value formula is a tool used to incorporate the time value of money in a measurement. In their simplest form, present value techniques capture the amount that an entity demands (or that others demand from it) for money that it will receive (or pay) in the future. Present value is one of the foundations of economics and corporate finance, and the computation of present value is part of most modern asset-pricing models, including option-pricing models. Moreover, the present value of estimated future cash flows is implicit in all market prices. That relationship is readily apparent when applied to financial assets like loans or bonds, but should it extend to all assets and liabilities involved in actuarial practice?
11. Does a present value measurement that fully captures the economic differences between assets or liabilities need to include all the following elements:
  - An estimate of the future cash flow, or in more complex cases, series of future cash flows at different times.
  - Expectations about possible variations in the amount or timing of those cash flows.
  - The time value of money, represented by the risk-free rate of interest.
  - The price for bearing the uncertainty inherent in the asset or liability.
  - Other, sometimes unidentifiable, factors including illiquidity and market imperfections.