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CURRENT DEVELOPMENTS IN EMBEDDED VALUE REPORTING

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ABSTRACT

This paper reviews the developments in reporting of traditional embedded value and summarises some of the reasons why this is now undergoing change. It considers the purpose of an embedded value calculation and the effect of differing attitudes to risk. It comments on the recently developed European Embedded Value Principles and sets out the main areas where scope remains to apply judgement.

The paper proposes the market-consistent embedded value framework as a way forward to help provide guidance in some of these areas, in particular on the choice of discount rate and on calibration of stochastic techniques used to value embedded options and guarantees. The paper recognises that market-consistent embedded values are in relative infancy and sets out areas for possible future development.

KEYWORDS

Life Assurance; Embedded Value; Profit Reporting; Categories of Risk; Discount Rate; Options and Guarantees; European Embedded Value; CFO Forum; Market Consistent Embedded Value; Market Consistent Valuation

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1. Introduction

1.1 Whilst the actual contribution to profit of a portfolio of life assurance business can only be measured once the last policy has left the books, the development of fast and readily accessible computing power has enabled the application of cash flow techniques to estimate future profit contributions of the portfolio. Anderson (1959) and others described techniques for pricing products and valuing the in-force business. As personal computers developed, so did the applications of these techniques for projecting or estimating the profitability of a portfolio. Typically, this was by means of a mathematical model in which 'best estimate' assumptions were made about future experience, for example relating to mortality, lapses, asset yields, expenses and expense inflation, and projected surpluses were discounted at the shareholders' required rate of return. (The exact meaning of 'best estimate' has provided a topic for discussion within the actuarial profession. We return to this in Section B.14.) Deterministic estimates of the 'embedded value' of a portfolio have become common in the past 20 years, and the techniques can now be extended to produce an embedded value based on stochastic methods. The actuary of the early 21st century is, however, in something of a dilemma, in having to decide how to continue to develop valuation methods based on assessments of risk, or whether to use methods more directly calibrated to external market prices.

1.2 The working party responsible for this paper was set up by the Faculty and Institute of Actuaries' Life Board, because of concerns about current practice. These include, *inter alia*, consistency between economic assumptions, including the risk discount rate, recognition of costs from options and guarantees, expense assumptions and disclosure. Our task was to propose tactical developments to the execution of an embedded value approach that would improve its relevance and transparency as supplementary or primary reporting, and its consistent application for United Kingdom life insurers and their overseas subsidiaries.

1.3 After initial consideration, and supported by feedback from the recent Life Convention in Edinburgh, we felt that there were already sufficient developments on the topic, and that the construction of a further framework by us would not be helpful. This paper is, therefore, largely a review of past and current practice, including a discussion of the problems referred to above and, more importantly, a commentary on current developments. It concentrates on two of them. The first are the 'European Embedded Value Principles' (EEV Principles), developed by a forum of Chief Financial Officers of a number of the largest European life offices (CFO Forum). (The EEV Principles are included in Appendix A.) The second is the development of what are called 'enhanced' or 'market-consistent' embedded values, which use concepts of financial economics. Nomenclature is still developing in this area, and the phrase 'enhanced embedded values' has been

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used for a range of techniques. Consequently, we use the phrase 'market-consistent embedded value' or 'MCEV' in this paper, but recognise that not all actuaries working in this field necessarily use this phrase.

1.4 The structure of the remainder of this paper is as follows. In Section 2, we summarise some of the background to traditional embedded value techniques used hitherto, and we summarise some of the reasons why these are now undergoing change. In Sections 3 and 4, we consider the purpose of an embedded value calculation, and the effect of differing attitudes to risk, and, in Section 5, we comment on the EEV Principles. In Section 6, we introduce the topic of MCEV. (Appendix B gives an extensive description and discussion of current MCEV techniques.) Section 7 discusses the topic of disclosure. In Section 8, we set out our views on the limitations of non-MCEV approaches, and describe a way forward.

1.5 The views expressed in this paper are the collective views of the Embedded Value Working Party, unless otherwise stated. These views are not necessarily those of the employers for whom the individual members work, the bodies which they represent, or the Faculty and Institute of Actuaries' Life Board.

2. Background

2.1 *The Geddes Committee and Guidance*

2.1.1 The first Institute working party to consider the topic of embedded values was under the chairmanship of J. A. Geddes. This was established in May 1987, and reported to an Institute seminar in November 1988, with a written report being produced in February 1990. A principal objective of the working party was to consider the extent to which methodology and principles needed to be codified or prescribed. The report gives a good review of embedded value techniques, and the important questions which surrounded them, at that time. The report is candid, that there was a division of opinion amongst members on a number of topics. A summary of their proposals is given here in Appendix C.

2.1.2 Geddes *et al.* (1990) contained recommendations on two levels of disclosure, the first being confidential disclosure by the reporting actuary to his principals/clients, and the second being public disclosure in financial statements and other published documents. The first level was considered to be a matter principally for the Actuarial Profession to decide; the second level would need to be discussed with both the accountancy profession and the life assurance industry, including parent companies which are not themselves assurance companies. Until the takeover of the Pearl Group (Pearl) by a subsidiary of the Australian Mutual Provident Society (AMP), embedded value accounting was viewed principally as a matter for the Actuarial Profession. The working party considered its role to be to provide

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the groundwork for the development of a more formal statement of recommended practice acceptable to the accountancy and actuarial professions, supported by a Guidance Note on the actuary's duties of disclosure and codification of technical methodology.

2.1.3 In 1989, AMP completed its successful bid for Pearl. In their sessional paper, Salmon & Fine (1990) described various issues which had arisen in this hostile takeover, suggesting areas where the Profession may have wished to become involved. The issue of the publication of an appraisal value was a key issue. Many believed that the final result of the takeover was detrimental to the shareholders of the Pearl, because of the lack of published financial information until it was too late for it to be accepted and understood by the investment community. This triggered a number of listed companies into publishing more realistic information on a regular basis, with their efforts for standardisation being channelled through the Association of British Insurers (see ¶2.2).

2.1.4 However, the Profession has produced no more guidance, although many actuaries produced embedded value calculations, both as a value figure for use in transactions involving capital values, and as a tool for calculating the value added by management and management decisions in financial statements and other published and internal documents. The fact that there were a considerable number of embedded value calculations being made, some with published assumptions, led to a limited amount of convergence.

2.1.5 There were a number of subsequent sessional and Staple Inn meeting papers which discussed embedded value, for example Mehta (1992), Wright (1992), Collins & Keeler (1993), Sherlock *et al.* (1994), Mehta (1996), Simpson & Wells (2000) and Sheard *et al.* (2001). In particular, there were discussions on the appropriate method of establishing risk margins. In practice, the most important was the choice of the risk discount rate and its relationship with other economic parameters, such as the assumed investment returns and the associated rate of inflation.

2.1.6 Embedded value accounting did offer a number of advantages; by no means the smallest was that it provided a more realistic alternative to statutory accounting, under which new business strain had the effect that a successful and fast growing company appeared to be making greater losses than a less successful company. The embedded value method recognises the expected value of the new business written. However, the European Commission Insurance Accounts Directive did not permit embedded value accounting, although some mitigation of new business strain was allowed through the use of a deferred acquisition cost asset. Banking groups were not within the scope of the Insurance Accounts Directive, and continued to use embedded value in their primary financial statements.

2.1.7 Outside of the actuarial profession, investment analysts welcomed the additional insight given by published embedded value figures, as

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compared with both the primary financial statements and the regulatory returns, but were frustrated by the multitude of approaches taken to their calculation.

2.2 *The 'Achieved Profits' Method*

It fell to the Association of British Insurers (ABI) to develop more realistic accounting formats, within the constraints imposed by the accounting framework. Their initial attempts, in the early 1990s, to provide a new form of primary reporting generated draft guidance on what it termed 'the accruals profits' method. However, this was in a format which could not get the franking of the U.K. Accounting Standards Board. When it was recognised that the accruals profits method could not be used for primary reporting purposes, new guidance was issued under the term 'achieved profits', with a number of preliminary drafts, culminating in final form in December 2001, ABI (2001), entitled 'Supplementary Reporting for Long Term Insurance Business (The Achieved Profits Method)'. This guidance was developed with the sole aim of reporting the shareholders' profits from long-term insurance business. The corresponding balance sheet presentation is for use in supplementary reporting in accounts of proprietary insurance companies or in consolidated accounts of proprietary insurance groups. The method recognises: "the achieved profits in the shareholders' fund which comprises the present value of the shareholders' interest in the long term business contracts and related shareholders' net assets". Its principal features are summarised in Appendix C.

2.3 *The Drivers for Change — Problems with 'Traditional' Embedded Value Methods, and Changes in the Reporting Environment*

2.3.1 In recent years, a number of problems with the traditional embedded value methodology have emerged. Some of these have received greater attention recently, as a result of stock market falls since 1999 and declines in interest rates. In addition, new techniques and methodologies have become feasible, as a result of vastly increased computer processing power and sophistication of modelling systems. Some of these new techniques have been used, or proposed, for regulatory or accounting purposes.

2.3.2 The allowances for risk, in particular the choice of risk discount rate, have always been central to the determination of an embedded value. However, the subjectivity involved in this is now under increasing scrutiny. Even if it is possible to determine what risks are not allowed for elsewhere in the basis, there is no generally accepted methodology for converting these risks into additions to the risk free rate. This means that the final choice of discount rate depends heavily on the judgement of the company's management or actuary.

2.3.3 There has been criticism of the use in cash flow projections of risk premia to reflect the higher return expected from riskier assets, when it is not

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clear that the risk discount rate explicitly allows for the risks involved in investing in these assets.

2.3.4 The presence of risk premia in the projection basis leaves open the possibility of the value being influenced by the potentially hypothetical choice of investment mix.

2.3.5 Whilst many actuaries would argue that the value of financial options and guarantees contained in products may have been recognised in traditional embedded value methodologies by a combination of explicit provisions and the choice of risk discount rate, this allowance is not transparent. Furthermore, doubts have been raised as to whether such approaches always reflect the full economic value, including the time value, of such options. This is a particular example of where a single deterministic projection does not capture asymmetric risks to shareholder cash flows. Increasing recognition of the existence of such asymmetric risks has been the driver behind the use of increased modelling sophistication and processing power to understand and analyse their impact, whether internally, for the insurance company's own management, or externally, as required by the regulator.

2.3.6 The International Accounting Standards Board (IASB) has started to develop 'fair value accounting', which, it is generally anticipated, will lead to greater volatility in emerging profits. While these developments are as yet incomplete, the debate surrounding them has focused minds on fair values and on the impact on shareholder value of the volatility and asymmetry of future cash flows. These are features which have tended to be absent, or not clearly quantified, in traditional embedded value reporting.

2.3.7 In the U.K., the Financial Services Authority's (FSA) attention to realistic assessments has introduced the 'twin peaks' test basis for large with-profits funds and the individual capital assessment (ICA). As well as lending further impetus to the drive to assessing market and other risks more directly, these developments complicate the determination of future release of statutory surplus in an embedded value calculation. The U.K. and Republic of Ireland's Accounting Standards Board has recently published Financial Reporting Standard 27, which, *inter alia*, adopts a modification of the FSA's realistic liability assessment into the primary accounts.

2.3.8 It has been usual to regard 100% of the regulatory solvency margin as encumbered, and calculate the so-called 'cost of solvency', treating this amount of capital as locked in. However, some practitioners have used higher percentages of the solvency margin in an attempt to reflect the capital that is really required for the business. This can be an alternative approach to allowing for some elements of risk, but these differences of approach make comparisons between companies more difficult.

3. The Purpose of an Embedded Value Calculation

3.1 Embedded values are intended to reflect a realistic, risk adjusted,

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valuation of shareholder cash flows arising from in-force business and net assets. An aim, set out in Anderson (1959), is to value these cash flows (or, equivalently, the difference between the value of shareholder assets and the value of shareholder liabilities), consistent with the theoretical value that shareholders would place on them. This view is also expressed in ABI (2001). An additional, complementary, aim is that embedded value reporting is a report from management to shareholders, on whether they, management, have been creating or destroying shareholder value.

3.2 An embedded value produced for supplementary reporting is generally calculated as a 'value in use' of the in-force business, in other words the value to the company of the in-force business, if it continues to operate at its current level without material change. This embedded value may vary from the value which could be achieved in a sale of a portfolio of business, where the purchaser may take advantage of synergies resulting from its own circumstances, for example different expense and tax structures.

3.3 As we discuss later, determining an embedded value is necessarily a complex and subjective process, as many risks to shareholder cash flows are not traded in open or transparent markets. Given the statutory reserving and accounting practices used in the U.K. until recently, the main purpose of an embedded value was to value the release of the prudent margins required to be held in life insurance provisions. ABI (2001) describes this as follows:

> "The objective of this method is to provide shareholders with more relevant information on the financial position and current performance of long term business than that provided by the modified statutory solvency basis (as detailed in the ABI Statement of Recommended Practice ('SORP') on Accounting for U.K. Insurance Business) or any other solvency or deferral and matching method applicable to a non-UK subsidiary"
>
> "... long term insurance companies in all countries have similar constraints in terms of requirements for considerable margins for adverse deviations within the long term business provisions, profit sharing requirements and constraints on dividend distribution through solvency and investment reserve requirements. In general the constraints arise from
>
> — a conservative assessment of liabilities
> — a conservative assessment of assets
> — an additional requirement for a minimum level of assets over liabilities, both already valued conservatively
> — where relevant, the non distributability of assets maintained in a long term fund"
>
> "The main determinants of cash flow are; premiums, investment return, policy charges, claims, discontinuances and surrender/paid-up policy bases, expenses, taxation and the movement in the statutory solvency provisions and backing assets. In addition the cash flow for with-profit business reflects the level of bonuses arising from the profit sharing arrangements and undistributed surplus. Using realistic assumptions of cash flow the total profit expected to be earned over the lifetime of the contract can be estimated at the time of sale. The total profit represents a return for risks borne by the enterprise, earned over the life of the contract as a release from risk, and the work done in selling the contract and assuming the risk."
>
> "The allowances for risk defer to later years a part of the total profit expected to be earned over the life of a contract. The higher the allowances for risk, the greater the proportion of profit that is deferred. The balance is left to be recognised in the year of sale and this may be a significant proportion of the total profit reflecting the significance to

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the business of the completion of a profitable sale and of the work done in getting the contract onto the books."

3.4 The CFO Forum's EEV Principles contain similar statements:

"Embedded Value (EV) is a measure of the consolidated value of shareholders' interests in the covered business."

"EV is the present value of shareholders' interests in the earnings distributable from assets allocated to the covered business after sufficient allowance for the aggregate risks in the covered business."

"The embedded value should reflect the aggregate risks in the covered business. For example, interactions should be considered between explicit allowances for financial options and guarantees, the prudence of the liability valuation, the level and cost of required capital and the risk discount rate. Their combined impact should, *inter alia*, be sufficient to allow for both financial options and guarantees and the cost of holding required capital to support any mismatching of assets and liabilities."

3.5 Both ABI (2001) and the EEV Principles recognise the need to allow for risk in the calculation of value. Allowance for investors' aversion to the risks associated with future cash flows can be made in several ways. Historically, this has been achieved by the use of a uniform risk discount rate applied to all of the shareholder cash flows (including cash flows representing the release of solvency margins), to determine their present value. In producing the kind of valuation described above, one constraint which appears difficult to argue against is that imposed by the market. For example, taking credit in advance (without an offsetting allowance for risk) for shareholders' interests in equity risk premia, or credit risk spreads, in the embedded value of a life insurance company, is inconsistent with the same investor's valuation of an investment in the underlying equities or corporate bonds, which would give credit for higher returns only as they are achieved, and the associated risk runs off. The existence of markets for different baskets of risks, and adaptations of their pricing to features of the business being valued, provide a rich source of techniques which can be applied in producing embedded values.

3.6 Increasing use of such market-consistent valuation techniques, in assessing the value of assets and liabilities in the regulatory returns and accounts of life companies, could, perhaps, be viewed as removing the need for supplementary embedded value reporting, as there is less conservatism built into the reported figures. However, currently proposed solvency reporting and accounting developments typically retain features which would produce an 'unrealistic' shareholder value.

3.7 One such feature is the impact of capital requirements. Market-consistent valuation of assets and liabilities is accompanied by capital requirements, such as those under 'twin peaks' or the ICA. The value of such capital to shareholders would usually not be deemed to be its full market value (as would be presented in solvency returns or primary accounts), due to the impact of frictional costs. It also appears likely, given the current attitude of the IASB, that accounting information will remain 'prudent' (as

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compared with a realistic shareholder viewpoint) in some respects, for example:

(1) the deferral of future surpluses on investment management contracts (which shareholders would have an expectation of receiving);
(2) potentially deferring recognition of the value of future surpluses on new business at the point of sale (shareholders may view part of this value as being a return on their prior investment in the distribution infrastructure of the company, and that this should, therefore, be recognised at point of sale, with deferral only of those future cash flows expected to reward future risk); and
(3) some restrictions, for regular premium business, on the allowance which can be made for receipt of future premiums.

3.8 The issue is effectively one of the timing of profit recognition under different reporting requirements. Regulators and accounting bodies can be expected to take a more conservative view of this timing than do shareholders. It is important to recall that, ignoring the operation of interest accumulation on the timing of profit recognition, total profit emerging over the run-off of the in-force portfolio will be identical, except, possibly, for issues surrounding the eventual distribution of the inherited estate in a with-profits fund.

3.9 Moving towards market consistency in embedded value reporting raises a further interesting market comparison. To what extent do we expect a 'market-consistent' valuation of an insurance company (in the sense of valuing the assets and liabilities, or, equivalently, the shareholder cash flows, of the company on a risk adjusted basis consistent with how the market would value such assets, liabilities or cash flows) to be consistent with the market capitalisation of the company? Both are the market's view of value, but the former values only the in-force business, whereas the latter also includes the franchise value and, possibly, supply and demand factors.

3.10 If we view the embedded value as being a communication tool intended to influence market capitalisation, the market needs to be convinced that the embedded value, together with an assessment of franchise value, has been calculated by the company in a way that values risks which is not overall inconsistent with how the market would value the same risks. This will include assessment of frictional costs in one or both of the embedded value and the franchise value. The elements of the company's value (the 'economic balance sheet'), including frictional costs, are discussed further in Section B.2. If the calculated total value differs from the market capitalisation, one or the other must be 'wrong', or there is an arbitrage opportunity.

3.11 The alternative view is to start from the market capitalisation, and attempt to decompose it to produce a consistent reported embedded value. This approach is currently taken by some insurers, for example by examining

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the beta of the shares and the cost of debt financing, and using this to derive a risk discount rate (although this will suffer from the problem that, without appropriate adjustment, the beta reflects the historic volatility of the total market capitalisation of the company, including franchise value, rather than the current or future volatility of just the embedded value).

3.12 One further set of issues to consider is that the embedded value needs to be calculated making certain assumptions, such as tax treatment, of the 'typical' shareholder. Shareholders who are not typical will need to be provided with sufficient information to adjust the reported figures to their own situation, and to be made aware of the need to do so.

4. Risks

4.1 *Classifications of Risk*

Shareholders, *inter alia*, are providers of risk capital to insurers. They require an appropriate return on the capital as compensation for the level of risk to which they are exposed. An insurance company faces many risks, but there is no universally accepted definition of these risks. In Consultation Paper 97, FSA (2001) sets out its approach to risk classification, which is now well established in the U.K.

4.1.1 *Market risk* refers to the risk that arises from exposure to an adverse variation in costs or returns, resulting from a change in market price or rate which is not matched by a corresponding movement in liabilities. Volatility of equity returns and changes to investment returns are examples of market risk.

4.1.2 *Credit risk* refers to the risk of loss if another party fails to perform its obligations, or fails to perform them in a timely fashion. There are many forms of credit risk. The two largest credit risk exposures to life insurers usually arise from their investment in corporate bonds and reinsurance.

4.1.3 *Insurance risk* refers to the inherent uncertainties as to the occurrence, amount and timing of insurance liabilities.

4.1.4 *Liquidity risk* refers to the risk that a firm, though solvent (on a balance sheet basis), either does not have sufficient financial resources available to meet its obligations as they fall due or can secure them only at excessive cost.

4.1.5 *Operational risk* refers to the risk of direct or indirect loss resulting from inadequate or failed internal processes, people and systems, or from external events.

4.1.6 *Group risk* refers to the risk arising from belonging to a group of companies, both at the individual regulated company level and at the parent company level, i.e. the risk that actions or events of one company within the group may adversely affect the risk profile of another part of the group.

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4.2 *Reporting Embedded Value as Supplementary Information*

4.2.1 The embedded value should reflect the risk to shareholder cash flows.

4.2.2 The embedded value considers only a part of the total value of a life company. In particular, it excludes the value of future new business which the company expects to write. It should, therefore, exclude risks stemming from new business, although this may be difficult in practice, particularly where factors, such as tax and expenses, both influence and are influenced by cash flows from both new and existing business.

4.3 *Categorisation of Risk*

4.3.1 Risk can also be categorised into systematic and non-systematic. Systematic risk is correlated with the investment markets, and it cannot be diversified. Non-systematic risk is not correlated to the investment market, and can be diversified by an investor. Shareholders require a return for the systematic risk to which they are exposed. Current generally accepted financial economic theory, for examples see Brealey & Myers (2003), Mehta (1992) and Ross (1976), suggests that the market will not reward the taking on of non-systematic risk beyond an allowance for frictional costs, which we discuss later. An investor that does not want to be exposed to non-systematic risk can diversify it by investing in a large number of companies carrying out different activities.

4.3.2 Embedded value information, provided as supplementary reporting information, is frequently strongly influenced by management's view of the diversifiable risks to which the company is exposed. However, investors may want to assess the impact of using their own, or market, assumptions of the risk which they are taking on if they do not diversify. It is, therefore, important that the embedded value disclosures describe clearly the key assumptions, the risks allowed for in the valuation, and sensitivities to the central assumptions. This would facilitate an assessment of the benefit of diversification which investors may find possible to achieve.

4.4 *Market Risk and Credit Risk*

Market risk and corporate bond credit risk are systematic risks, and so need to be allowed for in the valuation of the insurance company. Where a market-consistent valuation is carried out, for practical reasons this is generally done either through the discount rates determined by the economic scenario generator, or through the use of the risk neutral or certainty equivalent approaches, where, in addition, cash flows are risk adjusted. This choice should not lead to different answers. For a traditional embedded value determination, based on best estimate economic assumptions, a discount rate needs to make sufficient allowance for these risks.

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4.5 *Liquidity Risk, Insurance Risk, Operational Risk and Group Risk*

Liquidity risk will, typically, be low for a company which has sold modern products for which the assets and liabilities can be, and are, well matched. Similarly, group risk will generally be low for a U.K. company, given the strong regulatory regime. Insurance and operational risks are often considered as only weakly correlated to the investment market, and therefore diversifiable by an investor. The main allowance for these risks, which affects a valuation of the in-force portfolio beyond the use of best estimate assumptions, is through the cost of holding capital. We note that some correlation may be present, for example mortality risk may be correlated to market risk through investment in companies with defined benefit pension schemes; also lapses and expense inflation may be correlated to wider economic influences, and therefore to financial markets.

4.6 *Risk Capital*

4.6.1 A company will aim to manage its risks, and, where appropriate, it will hold capital against some of these risks. By holding capital, a company will reduce, but not eliminate, the risk of becoming insolvent. We believe that the embedded value should make allowance for the costs associated with holding capital.

4.6.2 Within a traditional embedded value model, the allowance for the cost of holding capital arises from the margin between the assumed earned rate on invested assets and the risk discount rate.

4.6.3 Within an MCEV framework, in addition to an explicit allowance for risk arising from calibration to market prices, there may also be a further allowance for risk via frictional costs. These include tax, agency costs and financial distress costs. Having too much capital increases tax and agency costs, and too little capital increases financial distress costs. These points are discussed further in Appendix B.

4.6.4 Shareholders remain exposed to the risk of becoming insolvent, but, in a limited liability company, the shareholders are not committed to putting in additional capital when the insurance company requires it. This has a value to shareholders, and is referred to as the limited liability put option (LLPO). Including the LLPO value in the embedded value, without disclosing its value, may be misleading to users unfamiliar with the concept. There is a more extensive discussion of LLPO in Section B.7.

4.7 *Allowance for Risk in Traditional Embedded Value*

4.7.1 The traditional embedded value methodology typically has the following features and allowance for risk:

(1) Best estimate assumptions are used for basis items, such as investment returns, lapse and mortality rates, renewal expenses and tax.
(2) Statutory provisions are assumed to be held. The assumed earned rate on assets identified as backing the provisions (and encumbered capital

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reserves — see ¶4.7.1(5)) is the expected long-term return on these assets, and therefore includes risk premia. Some of the risk premia may be eliminated, for example the risk of defaults on corporate bonds. The discount rate contains an allowance for risk, and is, typically, higher than the average earned rate on the mix of assets backing the reserves.

(3) The ABI guidance on the achieved profits method describes the need for a consistent set of active economic assumptions (inflation, fixed-interest return, equity return, and other asset returns), other assumptions and allowances for risk via risk margins (primarily the risk discount rate). The fixed-interest return on the risk free assets is determined by the market at the time.

(4) The ABI guidance states that: "the risk (and hence the risk margins) applicable to a portfolio of business will not normally vary significantly from year to year." With the benefit of hindsight, we consider this debatable.

(5) Regulatory minimum capital is assumed to be held, and the structure of economic assumptions means that a 'lock-in' cost arises.

4.7.2 Thus, we can see that the traditional embedded value method allows for risk by a combination of using statutory reserves and encumbered capital, in the context of a risk discount rate, at a margin above the risk free rate.

4.7.3 In response to the problems with traditional embedded value, described in Section 2.3, a variety of changes have been suggested. The two propositions with the greatest momentum are the EEV Principles and MCEV methodologies.

4.8 *Further Comments*

The above discussion has raised three fundamental questions:

— What framework should we use to measure market and credit risk, and to what extent should the valuation reflect management's views and beliefs regarding these risks?
— What allowance should be made in the valuation for diversifiable risk?
— Where should the allowance for risk be made in the valuation?

We will return to these questions in Section 8.

5. European Embedded Value Principles

5.1 These were developed by the CFO Forum and published in May 2004. They consist of 12 'Principles', providing a framework for the derivation of valuation assumptions, calculation and reporting of embedded value results. The CFO Forum's stated intention is that member companies

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reporting supplementary embedded value information will adopt the EEV Principles for the 2005 financial year onwards.

5.2 The CFO Forum's published aims in producing the Principles and guidance are to bring greater comparability and consistency to information used by investors in insurance companies in an international context. In doing so, they have attempted to address the technical problems noted in Section 2.3. The CFO Forum's terms of reference were: to produce guidance which is sufficiently robust to allow consistent application between comparable companies; to allow for appropriate valuation of guarantees and options; and to prescribe a minimum level of disclosure, including sensitivity analysis, to allow comparability of results between companies.

5.3 The EEV Principles are set out in greater detail in Appendix A. Principles 1 to 6 cover issues primarily of definition, whilst 7 to 12 set out requirements for, and limitations on, practice, including references to disclosures. They are similar to ABI achieved profits guidance in some respects, including the use of some common terminology and a focus on measuring a present value of profit distributable to shareholders. In the following subsections, we comment on some of the points made in the Principles.

5.3.1 *Covered business*

5.3.1.1 The embedded value measure is applied to business types rather than to legal entities. A definition of that business and a reconciliation to financial reporting on other business in a group are required.

5.3.1.2 We believe that the concept of 'covered business', the contracts to which the methodology has been applied, and the statement that this should be clearly identified, are very useful. Embedded value techniques may be applied to businesses other than life assurance, including accident and health business, asset management operations, mortgage and other banking business, although it is emphasised that the methodology applies at contract level rather than entity level in such cases.

5.3.2 *Definition of embedded value*

5.3.2.1 Embedded value can be defined as the sum of:

— free surplus allocated to the covered business;
— required capital less the cost of holding required capital; and
— the present value of future shareholder cash flows from in-force covered business.

These three elements are defined in Principles 4 to 6. It is inevitable that these elements are interlinked, because all assets supporting the portfolio are available to meet claims. Views differ as to whether the required capital forms part of the free assets which are constrained, and should be valued at less than their market value, or whether it is more appropriate to consider the

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cost of holding required capital as being as much part of the policy provision as the mathematical reserve. We note that this distinction is primarily presentational — if the same valuation technique is applied to both viewpoints, the same result ensues.

5.3.2.2 The assets allocated to the covered business should be capable of being identified as belonging to one of three categories:

— assets required to meet a liability measure for the business; or
— additional capital considered by the management to be required in supporting the in-force business; or
— additional 'free surplus' allocated to the business.

5.3.2.3 If the determination relates to an identifiable company, then the starting point for the free surplus is usually the company balance sheet. A matching rectangle is an admirable way of allocating the company assets to its various liabilities, and can inject an element of realism into the recognition of free assets. It is not unknown, for example, after all the more marketable assets have been allocated to insured liabilities, for the principal remaining 'free asset' to be a tax asset, whose precise value and timing is open to considerable debate.

5.3.2.4 Assets recognised as free surplus should be valued at their market value. In a U.K. statutory balance sheet, this is unlikely to be less than their book value, but the possibility should not be altogether discounted. In other countries, the free assets may be fixed-interest securities, which it is planned to hold to redemption, and, hence, are shown at book value in the balance sheet, whilst their current market value is considerably lower. This is frequently the cause of lively discussion between the valuing actuary and the CFO. It may be unpopular, but market value represents the present value of future payments in current market conditions, and hence the valuing actuary should sanction a higher value only in exceptional circumstances. Any difference between market value and value used should be disclosed, and the reasons for using a higher value should be explained.

5.3.3 *Adjustment for the valuation of options and guarantees*

5.3.3.1 Principle 6 requires the determination of the present value of future shareholder cash flows from in-force covered business (PVIF), reflecting the value of financial options and guarantees from in-force covered business, whilst Principle 7 requires that this allowance includes the time value of financial options and guarantees, using stochastic techniques consistent with methodology and assumptions used in the underlying embedded value.

5.3.3.2 We welcome the requirement to include, explicitly, the time value of financial options and guarantees. This will address one of the major issues with traditional embedded values. In addition, the EEV Principles require the disclosure of: "The nature of, and techniques used to value,

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financial options and guarantees". This greater disclosure will improve the transparency of this aspect of the valuation. However, the Principles allow considerable scope in the choice of methodology and assumptions, and it appears unlikely that comparisons between companies will be straightforward, particularly where the approach chosen is not market consistent and the result is not benchmarked against a market-consistent calculation. We acknowledge that market-consistent values of financial options and guarantees may be volatile over even a short time frame, reflecting fluctuations in market prices of traded options, which may be due to fluctuations in one or more of the yield curves, the asset index levels or the implied market volatility. These fluctuations may, at times, be significant, for example, possibly following unexpected major international events.

5.3.4 *Non-economic assumptions*

5.3.4.1 Non-economic assumptions used should be best estimates and be actively reviewed. The most straightforward of these are future demographic trends. These should be made using best estimate assumptions, which should have regard to both internal experience and external data, notably, for U.K. business, from the CMIB. There should be full disclosure of bases used, and changes should be made as, and when, there is clear evidence of a significant movement in future anticipated experience. The Principles state that favourable changes should not normally be anticipated beyond what has been achieved by the end of the reporting period.

5.3.4.2 The question of the appropriate treatment of expenses has been a feature of all three attempts to establish a set of solid guidelines for actuaries and others charged with determining an embedded value for profit reporting purposes. Because the embedded value relates only to future surpluses arising from business currently in-force, it excludes expenses which will be incurred in writing future new business. Consequently, it is essential that levels of renewal expense should be analysed to provide a reliable assumption of future expenses. Mis-estimation will have a significant effect on the embedded value calculation. Even assuming that an appropriate distinction can be made between current acquisition expenses and maintenance expenses, there is frequently difficulty in determining the appropriate level of ongoing renewal expenses. The most common problem is the extent to which development expenses associated with, for example, the development of new software systems should be regarded as 'one-off' expenses that will not be repeated in the future.

5.3.4.3 We believe that such exemptions should be critically reviewed. Even though the particular project may have a limited term, it may use resources, such as systems developers, whose main function is to work on such projects. A 'one-off' project of this type should not be excluded if there is a likelihood of a string of further similar projects being carried out in the future. The text accompanying the EEV Principles states that:

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> "in certain circumstances such as start-up operations, it may be appropriate to assume that unit costs will reach their expected long-term levels within a defined period. The extent to which such changes in unit costs have been anticipated should be separately disclosed. In addition, any exceptional development costs excluded from the unit cost base should be separately disclosed."

We support this advice. Nevertheless, the appropriate treatment of expenses remains an area where the result is sensitive to small variations, and where more than usual care and consistency are required. Sensitivities can help show the effect of alternative assumptions.

5.3.5 *Consideration of future new business*

Guidance to Principle 8 includes areas to consider in distinguishing between in-force and new business. This distinction is another challenging area, particularly with flexible forms of contract. The valuation would normally be carried out on the assumption that the company will remain a going concern at its current level of activity, unless there is knowledge that it will not. In the absence of evidence to the contrary, it should generally be assumed that adequate volumes of new business will be written in the future, so as not to cause investment mix or expense assumptions to be changed. If there is knowledge that future business is likely to fall, then, of course, the embedded value model should be adjusted.

5.3.6 *Economic assumptions*

In line with Principle 10, these should be internally consistent and consistent with observable market data. The interaction of future investment income yields, future rates of growth in asset values, and future rates of inflation is one of the most difficult areas of judgement. One of the features, during the past decade, was the frequent assumption of a higher total return on equities than on fixed-interest securities. Investors have found, to their cost, that the risk involved was also significantly higher.

5.3.7 *Holding or service companies*

5.3.7.1 Traditional embedded values only placed a value on the life business. This enabled profits or losses to be passed to holding or service companies, to be excluded from profit beyond the result for the current year. This issue was addressed in part by ABI (2001).

5.3.7.2 The EEV Principles require the proportion of the holding or service company that is in respect of covered business to be valued on a 'look through' basis. Whilst this may appear to increase the transparency of results, it is important that both the product companies writing the business and the holding or service companies are consistent in how they treat any charges passing between them.

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5.3.8 *Disclosures*

There should be significant disclosures directed towards enabling a user to understand the methods and assumptions used and the reasons for movements in the embedded value, as well as sensitivities: "intended to allow an informed analyst to make valid comparisons on different assumption sets." We review the topic of disclosure in Section 7.

5.4 *Allowances for Risk*

Guidance to the Principles, as set out in Appendix A, requires that allowance be made for all risks associated with the covered business. Possible allowances for risks include: explicit allowances for financial options and guarantees; the prudence of the liability valuation; the level and cost of required capital; and the risk discount rate. Practical issues for practitioners will lie in ensuring that the risk discount rates and other assumptions chosen do make sufficient allowance for risk.

6. Market-Consistent Embedded Value

6.1 In this section we briefly describe market-consistent embedded value, and set out the main differences between MCEV and other accounting measures, the traditional embedded value, an interpretation of fair value accounting, and recent U.K.GAAP developments. In Appendix B, we provide an extensive background to the development of the MCEV framework and a discussion of the following implementation issues relating to MCEV methodology and assumptions:

— the various ways in which one can present and calculate MCEV;
— the various modelling techniques available to calculate MCEV;
— the allowance for own credit risk in MCEV;
— the allowance for the liquidity premium in MCEV;
— the discount rate used in MCEV;
— the choice of the risk free rate assumption to be used in MCEV;
— how to value the MCEV of participating business;
— the market-consistent value of recently written new business;
— which frictional costs to allow for in MCEV;
— the allowance for diversifiable risk in MCEV; and
— the analysis of movement and sensitivities in MCEV.

6.2 Within the MCEV framework, assets and liabilities are valued in line with market prices and consistently with each other. In principle, each cash flow is valued using the discount rate consistent with that applied to such a cash flow in capital markets. Thus, the value of assets is the market value of the assets. The value of liabilities is the value of comparable asset cash flows (or the value of a replicating portfolio).

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6.3 MCEV is a term which has been used to cover a number of different applications of the economic balance sheet framework, which we set out in Appendix B. From one perspective, MCEV may simply mean valuing the tangible assets of an insurance company at their market value and the liabilities at their 'market-consistent' value. In this sense, market-consistent valuation is simply an application of standard valuation principles to insurance companies, like much of the FSA's new realistic reporting regime for with-profits business. MCEV may also include other elements of the economic balance sheet, for example an allowance for the 'frictional costs' of holding assets and writing business through an insurance company's corporate and legal structure.

6.4 In this paper, we use the term MCEV to refer to all approaches which include an explicitly market-consistent valuation of assets and liabilities, regardless of any other adjustments made. We believe that this is clear in context, but the reader should be aware that MCEV may be a term used differently elsewhere.

6.5 MCEV draws on corporate finance, financial economics and modern portfolio theory underlying the economic balance sheet, to develop a more robust financial reporting and performance management framework for life assurance companies.

6.6 From a financial reporting perspective, MCEV forms a subset of the economic balance sheet, and there are differing views on which subset. These differing views are set out in Appendix B.

6.7 MCEV directly addresses three key criticisms of traditional embedded value:

(1) The risk discount rate (or equivalent) is set objectively, and is based on observable market rates of return at the valuation date.
(2) The costs of options and guarantees are valued explicitly, using stochastic option pricing techniques consistent with the market price of options.
(3) An explicit cost of capital, if included, reflects the frictional costs associated with an insurance company structure.

6.8 The main differences between MCEV and fair value accounting, as defined by IASB (2001) and IASB (2003a), are:

(1) Fair value accounting may, in practice, restrict the profitability of new business at point of sale to nil, whereas MCEV does not contain such a restriction.
(2) Fair value accounting may contain market value margins, which are prudential adjustments to best estimate projection assumptions, whereas MCEV does not. These margins may be interpreted as being an implicit cost of capital adjustment.
(3) Fair value accounting may, in practice, exclude premium renewals, where these lead to an increase in shareholder value, whereas MCEV does not contain such a restriction.

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(4) Fair value accounting does not include an explicit cost of capital adjustment, whereas MCEV may adjust for frictional costs.

6.9 We note that IASB (2003b) indicated that, for Phase II of International Financial Reporting Standard (IFRS) for insurance contracts, it would revisit its tentative conclusions from first principles, with no decisions reached until June 2005 at the earliest.

6.10 In December 2004, the U.K. and Republic of Ireland's Accounting Standards Board published Financial Reporting Standard (FRS) 27, which represents its response to the consultation process initiated by the publication of Financial Reporting Exposure Draft (FRED) 34. The main embedded value developments, and how these compare with MCEV, are described below.

6.10.1 FRS 27 restricts a self-generated value of an in-force asset, shown in a company's primary accounts, by excluding "from the value of that asset any value of in-force policies that reflects future investment margins." (This restriction does not apply to the value of in force used to support the realistic liabilities of a with-profits fund.) We believe that this restriction is implicit within the principles underlying MCEV, as described in Section B.1, although this may be open to interpretation.

6.10.2 In addition, FRED 34 proposes the restriction to a value of an in-force asset, shown in a company's primary accounts, arising from "any value attributed to the contractual rights to future investment management fees that exceeds their fair value as implied by a comparison with current fees charged by other market participants for similar services", similar to IFRS 4. FRS 27 does not include this restriction, stating: "it was clear from the comments received that the restriction was not being interpreted consistently and that the differences in interpretation could have a significant effect on the amount at which the VIF asset was recognised", for example, see Wright *et al.* (2004). We note that, for investment contracts, such a restriction will apply from 2005 by virtue of IAS 39. By contrast, MCEV does not contain such a restriction.

6.11 MCEVs have been published by AMP (2003), Royal & Sun Alliance (2003) and HHG (2004); the latter was produced as supplementary information to the end year report and accounts. MCEV is also used by some companies as part of their internal financial management and internal performance measurement.

6.12 It is recognised by many, including members of this working party, that market-consistent techniques provide a robust approach for implementing the EEV Principles. In particular, they provide a benchmark for setting the risk discount rate and calibrating stochastic option pricing models.

6.13 We recognise that MCEV is in its relative infancy, and welcome future developments. We set out some areas for possible future development in Appendix B.

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7. Disclosure

7.1 *History of Disclosure*

7.1.1 Embedded value information has been published in some form since the mid 1980s. In those early years, the disclosure around the methodology and assumptions was generally very limited. In the early 1990s, some companies began adopting the 'accruals' method. At this point, there was very little consistency in the way in which the results were being calculated, and there was a very clear need for some industry standards. By the mid 1990s, most proprietary U.K. life companies were publishing embedded value/achieved profits information. However, the level of details provided in the results and the extent of disclosure were still mixed, with the large with-profits companies providing considerable detail, while some others provided only basic disclosure.

7.1.2 By the mid 1990s, the general level of disclosure was greater than in previous years. Companies were starting to make comments about how operating experiences (e.g. annuitant mortality) were impacting the achieved profits result, as well as giving greater detail around key assumptions and methodology. Furthermore, by this time, most published results were being reviewed by the company's consulting actuaries or auditors.

7.1.3 Prior to ABI (2001), the ABI provided draft papers containing substantial guidance on the accruals and achieved profits bases, albeit with many options available regarding choice of methodology and assumptions. Some companies referred to this guidance in their supplementary information. As U.K. life insurers moved towards publishing audited embedded values in their supplementary information, the need for more consistency in methodology and assumptions became apparent, and this led to ABI (2001). This used a previous ABI guidance note, which accommodated both the accruals and the embedded value methodologies, but deleted sections and reduced the options available. In addition, ABI (2001) included a limited amount of further guidance, for example on the encumbrance of capital and treatment of service companies.

7.1.4 ABI (2001) formally sets out the guidance for accounting for shareholder profits, using embedded value methodology under the achieved profits banner. This guidance is optional, but, in practice, nearly all the listed U.K. life insurers have adopted it. It was recognised that a minimum standard of disclosure was required to ensure a meaningful comparison of results on a year-by-year basis, and also between companies. The last few years of achieved profits reporting have seen further convergence of, not only the methodologies used by companies, but also the economic assumptions, including the risk discount rate.

7.2 *Disclosure Required by the Achieved Profits Method*

7.2.1 ABI (2001) requires disclosure of the methodology and assumptions,

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together with the sensitivities of the results to changes in key economic assumptions. It also requires the presentation of the results in a standard format. However, the quality and extent of the disclosure still varies, with not all companies meeting all the requirements, which include details of how assumptions are determined, explanation of any development costs treated as non-recurring, and comment on projected non-recurring development costs, and comment on sensitivities for both the value of in-force and the new business contribution.

7.2.2 The intention of the achieved profits method is that the future cash flows are discounted at a rate which allows for the risk inherent in the business. In other words, the level of return that a shareholder would want to earn for investing in a riskier life company would be higher than for a more secure one. An analysis of the risk discount rates being used by major U.K. insurance companies, excluding bancassurers, does not bear this out. There is evidence that the risk discount rates on which achieved profits results have been calculated have been converging, to such an extent that it appears that they are driven more by a desire not to be out of line with their industry peers, rather than being truly reflective of the risk and uncertainty inherent in the business.

7.2.3 Arguably, it is currently left to the analysts to make their own determination of an appropriate risk discount rate to value the business, and to use any sensitivity information available to determine an 'adjusted' embedded value. The accuracy of such adjustments may be restricted by the range of risk discount rate sensitivities published to date.

7.3 *Disclosure Required by the EEV Principles*

7.3.1 EEV Principle 12, which is, by some margin, the lengthiest and most detailed of the EEV Principles, states that the embedded value results should be disclosed at consolidated group level using a business classification consistent with the primary statements. It is compulsory to comply with the Principles, and it should be explicitly disclosed that this is the case. If the guidance has not been complied with completely, then any areas of non-compliance and reasons should also be disclosed. There is a minimum level of disclosure which is required, including:

— assumptions;
— methodology;
— analysis of change;
— reconciliation of free surplus to GAAP equity;
— sensitivities;
— segmental information; and
— directors and reviewers statements.

The EEV Principles and guidance are set out in Appendix A.

7.3.2 The Principles strongly encourage additional disclosures, to facilitate

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understanding of the EEV movement. Disclosure of sensitivities should be made to allow an informed analyst to make valid comparisons on different assumption sets. Sensitivities should allow for consistent changes in cash flows that are affected by the change in assumptions, such as revised bonus rates.

7.3.3 At a high level, there appears to be little difference in the level of disclosure required, compared with that required under the achieved profits method, but greater compulsion in making disclosures. It is likely that more focus will be placed on the disclosure of methodology and assumptions than is currently the case, in particular with regard to the valuation of options and guarantees. Whilst, under ABI (2001), the key economic assumptions to be disclosed consist of the expected returns on assets together with the risk discount rates, new methodologies introduce concepts such as volatilities and correlations. These will need to be disclosed and stress tested. In addition to merely disclosing assumptions, there is also a requirement to disclose the underlying model. With so many different parameters to vary, it will likely take a period of time before it is clear how analysts are interpreting the information.

7.3.4 It is not clear how the reconciliation between U.K.GAAP (or IASB standards) and EEV profit will take place, but the movement towards fair value accounting and the intermediate requirements under FRS 27 will require both methods of reporting to place a value on, and disclose the methodology used to value, guarantees and options.

7.4 *Disclosure in the U.K. Regulatory Regime*

The U.K. regulatory regime has also moved to reflect that options have more of a value to policyholders (and thus a cost to shareholders and estate) than may be immediately obvious. The annual insurance company return now requires increased disclosure in its Appendix 9.4a, as to the methods and assumptions underlying the valuation of options and guarantees, and accepts that the methodology may vary from simple scenario testing to a comprehensive stochastic asset liability model. The FSA accepts a variety of approaches, as long as the methodology and assumptions used are fully documented. In addition to this, the FSA requires an analysis of the movement in the with-profits estate.

7.5 *The Future of Disclosure*

Since ABI (2001) was published, most proprietary life companies in the U.K. have started to prepare their results in the prescribed format. Until there is a universally accepted methodology for reporting life company profits, it will be impossible to standardise the disclosure produced. It remains to be seen whether the EEV Principles provide that methodology, but we expect that the consistency of the level and extent of disclosure will increase, following the adoption of these Principles over the coming few years.

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8. Conclusion

8.1 The companies involved in the CFO Forum include many of the largest, by premium income and assets, of European-based insurers and U.K. life companies. We understand that several other companies also intend to adopt the framework, provided by the EEV Principles, for regular public reporting of embedded value. We, therefore, consider it likely that the EEV Principles will provide a strong momentum towards a common European framework for embedded value reporting. We consider that the development of these Principles represents a significant step forward, and goes some way to addressing the problems, described previously, within a single coherent framework. They do, however, leave considerable room for manoeuvre, and, in this section, we review this development in the light of the points discussed earlier in this paper.

8.2 In ¶4.8 we posed three fundamental questions:

— What framework should we use to measure market and credit risk, and to what extent should the valuation reflect management's views and beliefs regarding these risks?
— What allowance should be made in the valuation for diversifiable risk?
— Where should the allowance for risk be made in the valuation?

We now return to a discussion of these points.

8.3 *What Framework should we use to Measure Market and Credit Risk?*

8.3.1 Some believe that this question should more realistically ask: "To what extent should the valuation reflect management's views and beliefs?" Anyone who has been involved in carrying out an embedded value calculation will be aware that an important element is explaining to management the effect of assumptions and positions that they may wish to take for relatively short-term tactical reasons. As we mention in ¶3.1, the valuation should be an attempt to provide a realistic, risk adjusted, measure of the value of shareholder cash flows, and this can lead to a conflict between realism and conservatism.

8.3.2 As we point out in ¶3.5, we believe that it is not appropriate to have margins for 'prudence' (or to assign a value to risk premia, which would have the opposite effect), in a valuation for embedded value purposes, that would produce anomalies if used when valuing market-traded instruments such as equities or corporate bonds in isolation. For this reason, we believe that a market-consistent valuation can, potentially, produce greater realism and less scope for arbitrary behaviour in setting certain parameters. Essentially, this approach values the shareholder cash flows for market risk on the same basis that similar market-related cash flows are valued in the financial markets. We believe that this provides a more objective assessment of these risks. Where management's view of market risk differs from that of

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the market itself, it would be helpful for the consequences of this view to be stated numerically, so that users of the financial statements can make appropriate adjustments if they wish. If possible, we believe that it would be helpful for approaches, which are not directly market consistent, to be compared with a market-consistent valuation, in order to ensure that the approach used does not inadvertently make insufficient (or too much) allowance for market risk.

8.4 *What Allowance should be made in the Valuation for Diversifiable Risk?*

8.4.1 The EEV Principles continue to follow traditional embedded value practice, by making allowance for diversifiable risk, principally through an implicit margin in the discount rate and its impact on the cost of capital, including the cost of holding both policy provisions and required capital. Indeed, it would be perfectly acceptable for this to be the only allowance, provided that it is considered to be sufficient.

8.4.2 MCEV techniques also require allowance for these risks to be made, notably by making explicit adjustments for frictional costs, but, in general, the same approach is adopted. The MCEV framework appears to offer greater scope for the impact of diversifiable risk on frictional costs to be more directly and transparently assessed by the use of stochastic modelling. While some companies may have begun to do this for the main risks which could generate frictional costs, the methodologies and models being used are not yet standardised or widespread. This contrasts with the allowance in MCEV for market risk, where the scope for taking different approaches is far more limited.

8.4.3 In both cases, the actuary needs to decide whether the allowance for diversifiable risk is sufficient. The traditional embedded value approach and the EEV Principles require this to be done by an implicit allowance in the discount rate, whereas the MCEV framework offers a range of reasonable, arguably more objective, approaches, though they are not yet fully developed. Our conclusion is that, at the time of writing, this is a topic best regarded as a sensitivity issue. A good insight can be gained by first considering which risks are diversifiable, then applying to them the intelligent use of a mix of judging the effect of various levels of margin and stochastic modelling of key risks (including their frictional cost effects), as this becomes increasingly feasible. We have a concern that the use of insight alone requires a great deal of experience, and that the layman, or someone inexperienced in the analysis of such accounts, would find it difficult to come to a meaningful interpretation.

8.5 *Where should Allowance for Risk be made in the Valuation?*

8.5.1 We reiterate the fundamental difference between traditional embedded value methodologies and the market-consistent framework. However tightly the rules are drawn, there is still scope for freedom and

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judgement in the choice of 'risky' parameters in a traditionally-based embedded value approach, which continues to be allowable under the EEV Principles. MCEV techniques are more objective in assessing market risk, often the major constituent of risk in the valuation. The result may be that, under MCEV, the level of key parameters, such as the principal discount rate, vary more significantly between offices, to reflect the different exposures to market risk than is the case at the moment. We recognise that more work is required by the profession to gain consensus regarding how to allow for non-market risks in a valuation for financial reporting purposes.

8.5.2 It is clear that, if we are talking about a particular office or portfolio of business, techniques that produce wildly differing embedded values are suspect. If both traditional techniques and market-consistent techniques are consistently applied (making the same degree of 'sufficient' allowance for the same risks), then the same value should be obtained. In fact, it is possible to start from this premise, value the portfolio on both methods, and solve to obtain the risk discount rate implied by the choice of the other parameters in the traditional valuation which replicates the market-consistent result, and in certain circumstances this can be a useful exercise.

8.6 *Our Conclusions*

8.6.1 The work of the CFO Forum and its published principles have been valuable, and we have only minor comments, set out in Section 5. We believe that actuaries and CFOs will find common ground in using these Principles in the medium term.

8.6.2 We also note that, if both traditional and market-consistent methods are applied consistently, then the results obtained should, in theory, be the same, and should be capable of reconciliation.

8.6.3 We note that, as pointed out in Appendix B, current MCEV methodology still allows for a wide range of choice in its implementation — these possible choices are relatively few in the area of allowing for direct market risk, but there are rather more around the other areas of the economic balance sheet, including frictional costs, which implicitly allow for diversifiable risk. This is a natural area for those actuaries working in this field to develop, and we hope that these techniques will be more clearly defined and more widely accepted over the next few years.

8.6.4 Subject to the above proviso, we see considerable virtue in market-consistent techniques, and anticipate that their use will grow rapidly. Their particular virtues, as perceived by this working party, are that they are more transparent and more consistent than traditional techniques in the allowance for market risk, which may often be the most material risk currently faced by life insurance companies. In addition, by being linked to the 'market', and particularly when linked with the direct modelling of the impact of other risks, they provide a more solid and defensible foundation for a value determination.

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8.6.5 In the interim, the actuary remains faced with the problem of how to assess whether sufficient allowance has been made for risks under the EEV approach (by the combination of the choice of discount rate, locked-in capital and the cost of options and guarantees). This problem is also faced in an MCEV in the areas of non-market risk. A possible approach to this could be to perform a market-consistent valuation to the extent possible, given the office's systems and models, and use this as a benchmark in setting the allowance for risks in the EEV calculation. To the extent that the market-consistent model is perceived not yet fully to allow for all risks, the allowance for risks in the EEV should logically be set at a level which produces a value lower than that produced by the market-consistent model. Whether it is low enough to be providing sufficient allowance for these risks will remain a matter for judgement. As the market-consistent model becomes more robust over time, the subjectivity of the EEV allowance for risks will reduce, and the two results should converge.

8.6.6 Such an approach would also enable offices, and actuaries, to become increasingly confident of market-consistent models as they are developed, and to understand the evolution of market-consistent embedded values and MCEV profits over time.

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References

Abbink, M. & Saker, M. (2002). Getting to grips with fair value. Paper presented to the Staple Inn Actuarial Society.

Accounting Standards Board (2004a). Financial Reporting Exposure Draft 34, Life Assurance.

Accounting Standards Board (2004b). Financial Reporting Standard 27, Life Assurance.

AMP (2003). Proposal to demerge — explanatory memorandum.

Anderson, J.C.H. (1959). Gross premium calculations and profit measurement for non-participating insurance. *Transactions of the Society of Actuaries*, **XI**, 357-394.

Association of British Insurers (2001). Supplementary reporting for long term insurance business (the achieved profits method).

Association of British Insurers (2003). ABI statement of recommended practice on accounting for insurance business (SORP).

Babbel, D., Gold, J. & Merril, C. (2002). Fair value of liabilities: the financial economics perspective. *North American Actuarial Journal*, **6**(1), 12-27.

Blight, P., Kapel, A. & Bice, A. (2003). Market-consistent economic valuations for the wealth management industry. *Institute of Actuaries of Australia*.

https://doi.org/10.1017/S1357321700003226 Published online by Cambridge University Press

Boyle, P. & Hardy, M.R. (1997). Reserving for maturity guarantees: two approaches. *Insurance: Mathematics & Economics*, **21**(2), 113-127.
Brealey, R.A. & Myers, S.C. (2003). *Principles of corporate finance*, 7th Edition. McGraw-Hill/Irwin.
CFO Forum (2004). European embedded value principles and basis for conclusions.
Collins, S.A. & Keeler, D.J. (1993). Analysis of life company financial performance. Paper presented to the Staple Inn Actuarial Society.
Coulthard, I.P. & Sheldon, T.J. (2001). A market consistent approach to shareholder value. Presentation to the 2001 U.K. Life Convention.
Coulthard, P.J.A. & Parkes, A.R. (2004). Analysing movements in realistic balance sheets for with-profits funds. Paper presented to the Staple Inn Actuarial Society.
Cowling, C.A., Gordon, T.J. & Speed, C.A. (2004). Funding defined benefit pension schemes. *British Actuarial Journal*, **11**, 63-131 and 497-518.
Dullaway, D. (2001). Beyond embedded values — new developments in economic value methodology. Presentation to the 2001 U.K. Life Convention.
Dullaway, D. & Bice, A. (2002). The fair value of with profits. Presentation to the 2002 U.K. Life Convention.
Dullaway, D. & Foroughi, K. (2002). Broadening it out — the economic balance sheet. *Tillinghast-Towers Perrin Emphasis on Financial Management Special Edition*.
Dullaway, D. & Needleman, P. (2004). Realistic liabilities and risk capital margins for with profits business. *British Actuarial Journal*, **10**, 185-316.
Dullaway, D. & Smith, A.D. (2004). Risk free rates and the calculation of realistic balance sheets. Submission to the Faculty and Institute of Actuaries' Stochastic Modelling Guidance Working Group.
Exley, C.J. & Smith, A.D. (2003). The cost of capital for financial firms. Discussion paper presented to the Finance and Investment Conference.
Financial Services Authority (2001). Consultation Paper 97: Integrated Prudential Sourcebook.
Financial Services Authority (2004a). Policy Statement 04/16: Integrated Prudential Sourcebook for insurers.
Financial Services Authority (2004b). Consultation Paper 04/17: Implications of a changing accounting framework.
Financial Services Authority (2004c). Regulatory infrastructure and influence in the new actuarial regime. Speech by John Tiner to the 2004 U.K. Life Convention.
Foroughi, K., Jones, I.A. & Dardis, A. (2003). Investment guarantees in the South African life insurance industry. *South African Actuarial Journal*, **3**, 29-75.
Foroughi, K. & Whitlock, P.M. (2003). Restoring the credibility of embedded value. Presentation to the 2003 U.K. Life Convention.
Froot, K. & Stein, J. (1998). Risk management, capital budgeting and capital structure policy for financial institutions: an integrated approach. *Journal of Financial Economics*, **47**, 55-82.
Geddes, J.A., Brown, A.S., Dumbreck, N.J., Fine, A.E.M., Medlock, J., Morris, P.J., De Rivaz, N.F.C. & Taylor-Gooby, S.J. (1990). Recognition of life assurance profits — the embedded value approach. Report by the Institute of Actuaries Embedded Values Working Party.
GN45 (2004). Determining the with-profits insurance capital component (also known as TS2).
GN47 (2004). Stochastic modelling for life insurance reserving and capital assessment (also known as TS4).
Hairs, C., Belsham, D., Bryson, N., George, C., Hare, D.J.P., Smith, D.A. & Thompson, S. (2002). Fair valuation of liabilities. *British Actuarial Journal*, **8**, 203-340.
Hancock, J., Huber, P. & Kock, P. (2001). *The economics of insurance — how insurers create value for shareholders*. Swiss Re Publishing.
Hare, D.J.P., Craske, G., Crispin, J., Desai, A., Dullaway, D., Earnshaw, M., Frankland, R., Jordan, G., Kerr, M., Manley, G., McKenzie, J.L., Rae, R. &

https://doi.org/10.1017/S1357321700003226 Published online by Cambridge University Press

SAKER, M. (2004). The realistic reporting of with-profits business. *British Actuarial Journal*, **10**, 223-293.
HIBBERT, J., MOWBRAY, P. & TURNBULL, C. (2001). A stochastic asset model & calibration for long-term financial planning purposes. Finance and Investment Conference.
HIBBERT, J. & TURNBULL, C. (2003). Measuring and managing the economic risks and costs of with-profits businesses. *British Actuarial Journal,* **9**, 725-777.
HHG (2004). Full annual financial report and accounts for the year ended 31 December 2003.
HODGETT, P. & BELL, I. (1991). Minimum statutory reserves for investment account business. *Transactions of the Institute of Actuaries of Australia,* **II**, 1093-1194.
INTERNATIONAL ACCOUNTING STANDARDS BOARD (2001). Draft statement of principles.
INTERNATIONAL ACCOUNTING STANDARDS BOARD (2003a). Minutes of the January 2003 board meeting on international financial reporting standards.
INTERNATIONAL ACCOUNTING STANDARDS BOARD (2003b). Minutes of the November 2003 board meeting on international financial reporting standards.
INTERNATIONAL ACCOUNTING STANDARDS BOARD (2004a). International Financial Reporting Standard 4.
INTERNATIONAL ACCOUNTING STANDARDS BOARD (2004b). International Accounting Standard 39.
JARVIS, S., SOUTHALL, F. & VARNELL, E. (2001). Modern valuation techniques. Paper presented to the Staple Inn Actuarial Society.
JENSEN, M.C. & MECKLING, W. (1976). Theory of the firm: managerial behaviour, agency costs and ownership structure. *Journal of Financial Economics*, **3**(4), 305-340.
MEHTA, S.J.B. (1992). Allowing for asset, liability and business risk in the valuation of a life office. *Journal of the Institute of Actuaries*, **119**, 385-455.
MEHTA, S.J.B. (1996). Quantifying the success of a life office: cost of capital and return on capital. Paper presented to the Staple Inn Actuarial Society.
MERTON, R.C. (1974). On the pricing of corporate debt: the risk structure of interest rates. *Journal of Finance*, **29**, 449-470.
MERTON, R.C. & PEROLD, A. (1999). Theory of risk capital in financial firms. In *The new corporate finance: where theory meets practice*. D. Chew, ed. Boston: Irwin — McGraw Hill.
MILLS, S. (2002a). And what exactly is it? *The Actuary*, January/February 2002, 40-41.
MILLS, S. (2002b). Deflators: there's no getting away from them ... is there? *The Actuary*, May 2002, 26-27.
MUIR, M. & WALLER, R. (2003). Twin peaks — the enhanced capital requirements for realistic basis life firms. Paper presented to the Staple Inn Actuarial Society.
NG, H.M. & VARNELL, E. (2003). Frictional costs. Paper presented to the Staple Inn Actuarial Society.
ROSS, S.A. (1976). The arbitrage theory of capital asset pricing. *Journal of Economic Theory*, **13**, 341-360.
ROYAL & SUN ALLIANCE (2003). Proposal for rights issue.
SALMON, I.L. & FINE, A.E.M. (1990). Reflections on a takeover of a United Kingdom insurer: a case study. *Journal of the Institute of Actuaries*, **118**, 59-170.
SHEARD, J.M., GENTRY, L.D., HOWELL, D., MASON, A.T., MEHTA, S.J.B., PURVES, B., STEVENS, A. & WILSON, D.C.E. (2001). Summary and comparison of approaches used to measure life office values. Paper presented to the Staple Inn Actuarial Society.
SHELDON, T.J. & SMITH, A.D. (2004). Market consistent valuation of life assurance business. *British Actuarial Journal,* **10**, 543-626.
SHERLOCK, E.B.O., FROGGATT, H.W., GILLOTT, N.R., HARVEY, R.M., JENKINS, J.A., KEELER, D.J., PICKFORD, M.A. & TAYLOR, N.H. (1994). Life insurance company takeovers. *Journal of the Institute of Actuaries*, **121,** 199-258.
SIMPSON, P.H. & WELLS, G.G. (2000). Insurance mergers and acquisitions. Paper presented to the Staple Inn Actuarial Society.

https://doi.org/10.1017/S1357321700003226 Published online by Cambridge University Press

SMITH, A.D. (1996). How actuaries can use financial economics. *British Actuarial Journal*, **2**, 1057-1193.

SMITH, A.D., MORAN, I. & WALCZAK, D. (2003). Why can financial firms charge for diversifiable risk? Discussion paper presented to Bowles Symposium, Society of Actuaries (U.S.A.).

TAVERNER, N.H. (2004). Market-consistent embedded values — the practicalities. Presentation to the 2004 U.K. Life Convention.

TRUE, S.C. & COULTHARD, P.J.A. (2004). Market-consistent embedded values — a practitioner's guide. Presentation to the 2004 U.K. Life Convention.

WALLER, R. & ABBINK, M. (2003). Practical aspects of realistic valuations using a market-consistent asset model. Presentation to the Staple Inn Actuarial Society.

WHITLOCK, P.M. & BURNSTONE, S.E. (2001). Beyond embedded values — new developments in economic value methodology. Presentation to the Actuarial Society of South Africa, November 2001.

WRIGHT, P.W. (1992). Accruals profits — theory and practice. Paper presented to the Manchester Actuarial Society and the Staple Inn Actuarial Society.

WRIGHT, P.W., FOROUGHI, K. & OLSWANG, R.D. (2004). Financial reporting exposure draft 34 — life assurance. *Towers Perrin Update*, August 2004.

https://doi.org/10.1017/S1357321700003226 Published online by Cambridge University Press

APPENDIX A

EUROPEAN EMBEDDED VALUE PRINCIPLES

The following recitation of EEV Principles, together with more detailed comments, is included here by kind permission of the Stichting CFO Forum Foundation.

"Principle 1: *Embedded Value (EV) is a measure of the consolidated value of shareholders' interests in the covered business*.
G1.1 The EV Methodology (EVM) described here is applied to the calculation and reporting of the EV of the covered business.
G1.2 The EVM is to be applied to supplementary reporting in the accounts of proprietary companies that transact the types of business described in Principle 2.
G1.3 Adjustments must be made to ensure all covered business has been included appropriately. An example of such an adjustment might be in respect of a reinsurance or loan arrangement within the group to avoid distorting the EV.
G1.4 Except where they are not considered material, compliance with Principles (shown in bold) is compulsory and any non-compliance with underlying Guidance should be explicitly disclosed.

Principle 2: *The business covered by the EVM should be clearly identified and disclosed.*
G2.1 The business covered by the EVM should include any contracts that are regarded by local insurance supervisors as long term or life insurance business.
G2.2 The EVM may cover other long-term life insurance, short-term life insurance such as group risk business and long-term accident and health business insurance business. Where short-term healthcare is regarded as part of or ancillary to a company's long term life insurance business, then it may be regarded as long-term business.
G2.3 The EVM may be applied to other business such as asset management operations.
G2.4 The EVM applies to the contract, rather than the entity selling the contract. For example the EVM should be applied to covered business provided by non-insurance groups and operations such as banking groups and pension funds.

Principle 3: EV *is the present value of shareholders' interests in the earnings distributable from assets allocated to the covered business after sufficient allowance for the aggregate risks in the covered business. The EV consists of the following components:*

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— *free surplus allocated to the covered business*
— *required capital, less the cost of holding required capital*
— *present value of future shareholder cash flows from in-force covered business (PVIF).*
— *The value of future new business is excluded from the EV.*

G3.1 EV is defined as the sum of the values of components defined in Principles 4, 5 and 6 and as illustrated in the Appendix. However, a different presentation of the components of EV is permitted.
G3.2 The value of future new business should be excluded from the EV. Principle 8 defines new business and, by implication, in-force business.
G3.3 The EV should reflect the aggregate risks in the covered business. For example, interactions should be considered between explicit allowances for financial options and guarantees, the prudence of the liability valuation, the level and cost of required capital and the risk discount rate. Their combined impact should, *inter alia*, be sufficient to allow for both financial options and guarantees and the cost of holding required capital to support any mismatching of assets and liabilities.
G3.4 Projected reserves and cash flows should be net of outward risk reinsurance.
G3.5 Financing types of reinsurance and debt, including subordinated and contingent debt, can create a leveraging effect which should be reflected in the allowance for risks to shareholder cash flows. Such debt should normally be deducted from the EV at a value consistent with that which markets would place on debt with similar characteristics.

Principle 4: *The free surplus is the market value of any capital and surplus allocated to, but not required to support, the in-force covered business at the valuation date.*
G4.1 Free surplus is determined as any excess of the market value of all assets attributed to the covered business but not backing liabilities for the covered business over the required capital to support the covered business.
G4.2 Free surplus not formally allocated to covered business should not be included in the EV.

Principle 5: *Required capital should include any amount of assets attributed to the covered business over and above that required to back liabilities for covered business whose distribution to shareholders is restricted. The EV should allow for the cost of holding the required capital.*
G5.1 The level of required capital should be at least the level of solvency capital at which the supervisor is empowered to take action. It would also include any amount 'encumbered' by local supervisory or legal restrictions that prevents its distribution or removal from supporting the covered business.

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G5.2 The required capital may include amounts required to meet internal objectives, such as those based on an internal risk assessment or required to obtain a targeted credit rating.

G5.3 The cost of holding required capital is the difference between the amount of required capital and the present value of future releases, allowing for future investment return, of that capital.

G5.4 Where local supervisory or legal restrictions require the holding of an amount of capital in respect of specific financial options and guarantees within a legal entity which differs from that considered economically necessary, the difference in cost of required capital could be reflected in the allowance in the EV for those financial options and guarantees.

Principle 6: *The value of future cash flows from in-force covered business is the present value of future shareholder cash flows projected to emerge from the assets backing liabilities of the in-force covered business (PVIF). This value is reduced by the value of financial options and guarantees as defined in Principle 7.*

G6.1 Liabilities of the in-force covered business would normally be dictated by local regulatory requirements. The required capital should be consistent with the definition of liabilities used.

G6.2 The value of in-force covered business includes the value of renewals of in-force business.

G6.3 The PVIF before deduction of the allowance for the time value of financial options and guarantees should reflect the intrinsic value of financial options and guarantees on in-force covered business. The time value of financial options and guarantees is discussed under Principle 7.

Principle 7: *Allowance must be made in the EV for the potential impact on future shareholder cash flows of all financial options and guarantees within the in-force covered business. This allowance must include the time value of financial options and guarantees based on stochastic techniques consistent with the methodology and assumptions used in the underlying embedded value.*

G7.1 The valuation of financial options and guarantees should take as a starting assumption the actual asset mix at the valuation date.

G7.2 Where management discretion exists, has been formally approved and would be applied in ways that impact the value of financial options and guarantees, the impact of such management discretion may be anticipated in the allowance for financial options and guarantees but should allow for market reaction to such action.

G7.3 The value for financial options and guarantees should be deducted from the PVIF.

G7.4 The techniques used to calculate the allowance for the time value of financial options and guarantees should incorporate an allowance for stochastic variation in future economic conditions that is consistent with the projection assumptions applied under Principles 9 and 10.

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Principle 8: *New business is defined as that arising from the sale of new contracts during the reporting period. The value of new business includes the value of expected renewals on those new contracts and expected future contractual alterations to those new contracts. The EV should only reflect in-force business, which excludes future new business.*

G8.1 New Business is defined as covered business arising from the sale of new contracts during the reporting period, including cash flows arising from the projected renewal of those new contracts.

G8.2 The projected cash flows (PVIF) valued under Principle 6 should anticipate renewal of in-force business, including any reasonably predictable variations in the level of renewal premiums but excluding any value relating to future new business. New business should include recurring single premiums and changes to existing contracts where these are not variations in the PVIF. To distinguish between new business and in-force business, the following are examples of indications that premium represents new business:

— A new contract has been signed.
— Underwriting has been performed.
— A new policy or new policyholder details have been entered on administration systems.
— Incremental remuneration has become due to the distributor/salesperson.
— The pricing basis for the premium allows for the full cost of their marketing and distribution.

G8.3 The presence of renewal premiums in pricing assumptions is an example of evidence that renewals would be included in the value of new business. Renewals should include expected levels of:

— Contractual renewal of premiums in accordance with the policy conditions at the valuation date, including any contractual variation in premiums.
— Non-contractual variations in premiums where these are reasonably predictable; for example, premiums expected to increase in line with salary or price inflation.
— Recurrent single premiums where the level of premium is pre-defined and reasonably predictable.

G8.4 Other methods of distinguishing between new and in-force business are allowable, but should be clearly defined in disclosure.

G8.5 Any variation in premium on renewal of in-force business from that anticipated, including deviations in non-contractual increases, deviations in recurrent single premiums and re-pricing of premiums for in-force business, should be treated as an experience variance on in-force business and not as new business.

G8.6 The projection assumptions used to value new business should be consistent with those used to value in-force business.

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G8.7 The contribution from new business can be valued at either opening or closing assumptions and variance due to experience, excluding investment experience, on new business during the year should be treated accordingly as experience variances or new business contribution.

Principle 9: *The assessment of appropriate assumptions for future experience should have regard to past, current and expected future experience and to any other relevant data. Changes in future experience should be allowed for in the value of in-force when sufficient evidence exists and the changes are reasonably certain. The assumptions should be actively reviewed.*

G9.1 The projection assumptions should be determined using best estimate assumptions of each component of future cash flow for each policy group. Relevant data can be internal to the company or external, for example from experience analyses or inputs to pricing bases.

G9.2 Best estimate assumptions should be internally consistent and consistent with other forms of reporting such as (where relevant) those used for results on statutory, pricing or GAAP bases. They should, where appropriate, be based on the covered business being part of a going concern.

G9.3 The assumptions should be actively reviewed, and updated as appropriate, at least annually.

G9.4 Treatment of changes in future experience will be a matter of judgment Favourable changes such as productivity gains should not normally be included beyond what has been achieved by the end of the reporting period. However, in certain circumstances such as start-up operations, it may be appropriate to assume that unit costs will reach their expected long-term levels within a defined period. The extent to which such changes in unit costs have been anticipated should be separately disclosed. In addition, any exceptional development costs excluded from the unit cost base should be separately disclosed.

G9.5 Projection assumptions should be considered separately for each product group.

G9.6 Appropriate allowance should be made in the value of in-force business for demographic assumptions such as mortality, morbidity, renewals and future levels of withdrawals of in-force business. Such allowance should be based on past evidence and expected future experience consistent with the assessment of other projection assumptions.

G9.7 Future expenses such as renewal and other maintenance expenses should reflect the expected ongoing expense levels required to manage the in-force business, including investment in systems required to support that business and allowing for future inflation.

G9.8 Overheads should be allocated between new and in-force business in an appropriate way consistent with past allocation, current business plans and future expectations.

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G9.9 Holding companies' operating expenses should be allocated in an appropriate way.

G9.10 All expected expense overruns affecting covered business, including holding company operating expenses, overhead costs and development costs such as those incurred in start-up operations, must be allowed for.

G9.11 Where costs of managing the covered business are incurred within service companies, profits or losses to the service companies are to be valued on a 'look through' basis, so as to give a best estimate of the impact on future shareholder cash flows of the expenses to the group of running the covered business. Actual and expected profit or loss to an internal group company on services provided to the covered business should be included in allowances for expenses in the EVM. Where an external service company is used, the actual and future expected fees or charges should be allowed for in calculating the EV.

G9.12 Allowance in the projection must be made for all taxes and regulations in the relevant jurisdiction affecting the covered business. These should follow the local treatment and be based on best estimate assumptions, applying current legislation and practice together with known future changes.

Principle 10: *Economic assumptions must be internally consistent and should be consistent with observable, reliable market data. No smoothing of market or account balance values, unrealised gains or investment return is permitted.*

G10.1 Economic assumptions should be updated for each reported calculation of EV.

G10.2 Assumed investment returns should reflect the expected future returns on the assets held and allocated to the covered business at the valuation date. The assumed returns should allow for any credit risk on investments.

G10.3 Assumptions for the reinvestment of future positive cash flows should be based on the expected future investment strategy, consistent with other projection assumptions. Assumptions can allow for future switching between investment classes where this is expected to occur and is in line with an investment strategy with formal board approval. Any such switching assumption must be disclosed and its effect must be reflected in other projection assumptions such as capital requirements.

G10.4 The approach used in selecting fixed interest assumptions for current assets and new money should consider the current investment portfolio and gross redemption yields.

G10.5 In markets where longer-term fixed interest markets are underdeveloped, investment return assumptions should be based, where appropriate, on an assessment of longer-term economic conditions, or other markets.

G10.6 Projection assumptions should be consistent with current observed inflation levels and those implied by investment markets, for example via consideration of yields on inflation-linked securities.

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G10.7 Discount rates used to determine the present value of future cash flows should be set equal to risk free rates plus a risk margin. The risk margin should reflect any risk associated with the emergence of distributable earnings that is not allowed for elsewhere in the valuation.

G10.8 Valuation of financing types of reinsurance and debt, including subordinated and contingent debt, should ensure that the combined impact of their servicing costs and discount rates assumption does not distort the valuation of the underlying business.

G10.9 Risk discount rates may vary between product groups and territories.

G10.10 Asset values on which to base EV calculations must be consistent with values observable in investment markets and not be smoothed. Unrealised gains should be allowed for in the projections used to determine the projected shareholder cash flows. For the avoidance of doubt, this does not preclude the projection of book values according to local regulations in determining distributable earnings.

G10.11 Investment returns must be those actually earned on a market basis over the period and must not be smoothed.

Principle 11: *For participating business the method must make assumptions about future bonus rates and the determination of profit allocation between policyholders and shareholders. These assumptions should be made on a basis consistent with the projection assumptions, established company practice and local market practice.*

G11.1 Where regulatory/contractual restrictions or bonus participation rules are clear they should be applied to projections of participating business.

G11.2 Projected bonus rates should be consistent with the assumed future investment returns used.

G11.3 Where the company has an established bonus philosophy, this should be applied to projections of participating business.

G11.4 Where management has discretion over allocation of bonuses, including the realization of unrealized gains, projection assumptions should have regard to the past application of discretion, past external communication, the influence of market practice regarding that discretion and any payout smoothing strategy in place.

G11.5 It is possible that some of the assets (residual assets) allocated to the participating business would remain at the end of the projection (after all bonuses have been allocated) as unallocated surplus. This surplus should not be negative. Acceptable valuation treatments are to assume that such unallocated surplus would be distributed over time via final bonus to in-force business, or as bonuses to both in-force and future new business, and to value any shareholders participation in its distribution at discounted value.

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Principle 12: *Embedded value results should be disclosed at consolidated group level using a business classification consistent with the primary statements.*

G12.1 Compliance with the EVM Principles is compulsory and should be explicitly disclosed. When the EVM is referred to and Principles have been complied with but underlying Guidance has not been complied with in its entirety, the areas of non-compliance and reasons for non-compliance should be disclosed.

G12.2 Disclosure of sensitivities is intended to allow an informed analyst to make valid comparisons on different assumption sets. Sensitivity scenarios should include consistent changes in cash flows directly affected by the changed assumption(s), for example future bonus participation in changed economic scenarios.

G12.3 Embedded value is to be calculated at least once a year. It is an option to disclose the value of in-force business or new business more frequently.

G12.4 The following items should be disclosed as a minimum in the format shown. Additional disclosures to enable understanding of the reasons for movement in EV, and future sustainability of return on EV, are encouraged.

Assumptions

(a) The principal economic assumptions, the investment assumptions on all major asset classes including any assumption of future change in investment mix, inflation rates and the discount rates used at the start and end of the accounting period.

(b) How economic and other business assumptions (e.g. mortality, persistency, expenses and future asset allocation) are determined.

Methodology

(a) A clear, brief description of the covered business.

(b) The methods used to calculate the operating return on EV, including the shareholder cash flows underlying the PVIF, and whether the operating return is calculated using opening or closing assumptions.

(c) Treatment of consolidation adjustments, including inter-company arrangements such as reinsurance or loans associated with covered business and allocation of holding company and overhead expenses to covered business.

(d) For companies writing participating business, the approach used to determine future bonuses and the treatment of any residual assets

(e) The basis on which allowance has been made for the amount of, and cost of holding, both required capital and any additional amount regarded as encumbered in respect of both new business and in-force business separately.

(f) The reasons for any changes in the risk margins in the risk discount rate.

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(g) The method used to determine the value of new business including:
i. definitions of new business;
ii. any changes in the definition of new business and the impact of such changes on the value of new business;
iii. whether new business contribution has been calculated on opening or closing assumptions, at point of sale or year-end.

(h) The published new business premium volume and whether it is consistent with the definition of new business.
(i) Where new business margins are disclosed, these should be calculated as the ratio of the value of new business to the present value of new business premiums. Alternative calculations of new business margins may be disclosed as further information.
(j) The basis on which any memorandum disclosure of prior year comparatives on current assumptions has been made. The new business contribution, expected return and opening EV should be restated on consistent economic assumptions.
(k) Treatment of any development costs included in the result.
(l) The extent to which future productivity gains are anticipated.
(m) The approach used to allow for tax.
(n) The nature of, and techniques used to value, financial options and guarantees. The amount of, and reason for, any alteration to the allowance for financial options and guarantees made under G5.4.
(o) The basis of translation used for foreign exchange.

Analysis of Return on EV; reconciliation of opening and closing values
(a) The opening and closing EVs, together with a breakdown of the change in EV over the period. Presentation of the breakdown is at the discretion of the company, however the following items would be typical:

Capital Raised
Capital distributed
New business contribution
Return on in-force business
  Expected return
  Expected variances
  Operating assumption changes
Development Costs
Expected return on free surplus
Operating return before [after] tax and [before] exceptional items.
Investment return variances
Effect of currency movements
Effect of economic assumption changes
Exceptional items
Return on EV before [after] tax*

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Attributed tax
Return on EV after [before] tax*

*Some companies may choose to present this on an after-tax basis rather than attributing tax at the end.

(b) The supplementary information or the operating and financial review should identify and explain any variance between the actual experience and that anticipated in the projection assumptions (variance analysis). The effect of any change to the method or approach for reassessing expected experience should also be quantified and disclosed (model changes). Similarly, any impact resulting from changes in experience assumptions or risk margins should be disclosed and explained (assumption changes).
(c) The amount of any positive or negative return in respect of services provided to the covered business by another part of the Group that is not reflected in the reported EV or value of new business should be disclosed.
(d) Foreign exchange gains and losses and any other recognised gains and losses not reported as part of the return.
(e) Amount and cost of required capital at the start of year and end of year and the amount and cost of holding the minimum solvency margin.

EV Free surplus
(a) An analysis of the movement in any EV Free Surplus over the reporting period.
(b) The amount of any Free Surplus at the beginning and end of the reporting period. Reconciliation of free surplus or, in the absence of any free surplus, of required capital to consolidated group GAAP equity.

Sensitivities
(a) The sensitivity of the new business contribution and the EV (including the value of financial options and guarantees) to changes in assumptions.

Segmentation
(a) For companies with more than one business or geographical area of operation, the business classifications disclosed should be consistent with those used for primary statements.
(b) The following information should be provided for each segment:
— new business contribution
— operating return (note that some companies will determine everything after tax.)
— development costs
— EV Free Surplus and/or Required Capital
— main economic assumptions.

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Statements by Directors

(a) The supplementary information should include a statement from the directors that the EVM accounts have been prepared in accordance with the European Embedded Value Principles. Where reference is made to the European Embedded Value Principles in financial statements, but the guidance has not been complied with in its entirety, the areas of non-compliance and reasons for non-compliance should be disclosed.

(b) A statement should be included, where the methodology, assumptions and results have been subject to external review, stating the basis of the external review and by whom it has been performed.''

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APPENDIX B

THE MCEV FRAMEWORK

B.1 *Principles underlying Market-Consistent Valuation*

B.1.1 Market-consistent valuation has historically concentrated on valuing the in-force policyholder liabilities in line with market prices, and so consistently with the market price of the assets. Key principles underlying market-consistent valuation include the following.

B.1.1.1 *No arbitrage*

If two assets or liabilities have exactly the same cash flows in all possible circumstances, then they will have the same present value at the valuation date.

B.1.1.2 *Replication*

Any asset (or liability), whose cash flows are driven solely by the performance of traded assets, can be replicated through (dynamic) investment in a portfolio of these traded assets and the risk free asset.

B.1.1.3 *Discounting consistent with projection assumptions via 'bottom-up' approach*

In a market-consistent valuation, the projection assumptions can provide the expected reward for risk, but the discounting is at a rate reflecting the required reward for risk, given the projection assumptions chosen. In principle, it is possible for this to be achieved using a 'top-down' risk discount rate approach, where one risk discount rate is applied to all cash flows, as described in Anderson (1959). This risk discount rate reflects shareholders' overall required return on the component being valued. However, in practice, a 'bottom-up' approach is used, to ensure that the discount rate process is separately appropriate for each cash flow, policy, product line, region and balance sheet item, and that the discount rate process is appropriate for each valuation date.

B.1.1.4 *Market prices*

The modelling of the market-consistent liabilities is consistent with unsmoothed market information as at the valuation date, in particular asset index levels, risk free yield curves and the market price of traded options. Where appropriate, this information may be adjusted; reasons for possible adjustment include own credit risk or the frictional costs associated with the issuers of the market instruments. Sheldon & Smith (2004) provides more information in this regard.

B.1.2 However, for insurance companies, it is clear that these principles are necessary, but not sufficient, to put a value on the company. For

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example, investors require compensation for the impact on value of the corporate structure of the company, including the loss of control of their capital. This has led to the development of the economic balance sheet, which incorporates frictional costs and other elements.

B.2 *The Economic Balance Sheet and Economic Value*

B.2.1 The starting point to understand MCEV is the economic balance sheet and economic value. The economic balance sheet is a market-consistent framework for modelling and managing the insurance company or financial institution as a whole.

B.2.2 There is broad agreement, but some differing points of view, as to what elements should be in the economic balance sheet. For examples, see Blight *et al.* (2003), Dullaway (2001), Dullaway & Foroughi (2002), Exley & Smith (2003), Hancock *et al.* (2001), Smith *et al.* (2003), Sheldon & Smith (2004) and Whitlock & Burnstone (2001).

B.2.3 We would like to emphasise that this market-consistent framework is not entirely of recent or original thought. Inputs into the economic balance sheet framework have included research fields, including actuarial science, financial economics and corporate finance. For examples, see Babbel *et al.* (2002), Froot & Stein (1998), Hodgett & Bell (1991), Mehta (1992), Merton & Perold (1999) and Smith (1996).

B.2.4 For discussion purposes, we produce, in Table B.1, an economic balance sheet. We note that, in practice, one or more of the elements may be combined.

B.2.5 The elements of the economic balance sheet are now briefly described.

Table B.1. An economic balance sheet

Assets	Liabilities
Market value of tangible assets	Market consistent value of policyholder liabilities (100% credit risk free)
Franchise value	Pension scheme deficit
Tax shields	Debt and current liabilities
Limited liability put option	Frictional costs, including: — cost of double taxation — cost of double investment expenses — tax asymmetries — regulatory capital costs — cost of financial distress — agency costs — cost of raising capital in the market
	Economic value
Total assets	Total liabilities and economic value

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B.2.5.1 *Market value of tangible assets*

This represents the traded market value of all tangible assets (including current assets) held by the insurance company. For non-traded assets, estimates of market value are required.

B.2.5.2 *Franchise value*

This represents the value attributable to the ability of the company to write profitable new business in the future.

B.2.5.3 *Tax shields*

This represents the value to shareholders of the life company being able to avoid or delay the payment of taxation.

B.2.5.4 *Limited liability put option*

Shareholders of limited liability companies are generally not required to invest additional capital if the prudential or accounting liabilities of the company exceed the assets. This ability to walk away from a company in times of financial distress is, effectively, a put option to the shareholders of the company, and has value to shareholders. It is generally referred to as the limited liability put option (LLPO), or 'own credit risk'.

B.2.5.5 *Market-consistent value of policyholder liabilities (100% credit risk free)*

This can be defined as the theoretical price at which the life insurance policyholder liability cash flows would trade at, if they were considered 100% credit risk free, and traded in a perfect market. For practical reasons, a model is generally required to determine this price, either to interpolate or to extrapolate from market prices. A variety of modelling tools or techniques are available, and these are briefly discussed in Section B.6. In an MCEV, there is debate as to:

— whether the market-consistent value of policyholder liabilities should be implicitly reduced for the LLPO, or whether the LLPO should be valued separately or at all (we discuss this in Section B.7);
— whether the market-consistent value of policyholder liabilities should be reduced for the 'liquidity premium' (we discuss this in Section B.8); and
— how to allow for diversifiable risk in the market-consistent valuation of policyholder liabilities (we discuss this in Section B.14).

B.2.5.6 *Pension scheme deficit*

Although this is shown as a liability in Table B.1, for some companies the pension scheme may be in surplus, and so would be an asset of the company. This item can be valued using similar principles to the market-consistent valuation of the policyholder liabilities. Such principles may be similar to those discussed in Cowling *et al.* (2004), but may differ significantly from the

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pension scheme deficit valuation principles, discussed in FSA (2004b) and FSA (2004c). We note that key considerations in valuing the pension scheme deficit include the possible allowance for the LLPO and assumed future management actions. We do not discuss the market-consistent valuation of the pension scheme deficit further in this note.

B.2.5.7 *Debt and current liabilities*

This item refers to the corporate debt and current liabilities of the insurance company being valued. An approach may be to show the corporate debt at market value; an alternative approach may be to value the debt payments discounted at the 100% credit risk free rate, and increase the LLPO accordingly.

B.2.5.8 *Frictional costs*

These are sometimes referred to elsewhere as 'frictional capital costs' or 'frictional costs of capital'. Froot & Stein (1998), Jensen & Meckling (1976), Ng & Varnell (2003) and Taverner (2004) provide a detailed discussion of frictional costs. These are now discussed further.

B.2.5.8.1 *Cost of double taxation*

Unlike many industries, insurance companies are required to hold significant shareholder assets for long periods. In many countries, including the U.K., it is more tax efficient for investors to hold these assets directly than via the insurance company structure. In the former situation, they only incur tax on the investment return once, whereas, in the latter, they incur tax twice.

B.2.5.8.2 *Cost of double investment expenses*

The cost of double investment expenses is based on a similar rationale to the cost of double taxation, although, in some cases, it may be less material.

B.2.5.8.3 *Tax asymmetries*

These occur due to tax regulation. Examples include carrying forward losses, but immediate taxation of profits.

B.2.5.8.4 *Regulatory capital costs*

Regulatory capital costs occur where there are regulatory restrictions on the ability to raise or transfer capital, and so there are costs associated with overcoming these restrictions. Some do not believe that regulatory capital costs form a distinct frictional cost; instead, the influence of regulation increases the level of the other frictional costs, via the quantum of capital. Nevertheless, if material, it may be useful to disclose this impact separately.

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B.2.5.8.5 *Cost of financial distress*

This represents the value impairment experienced by a company as it heads towards financial distress. This includes:

— costs incurred as the company acts to maintain its franchise value, for example, the opportunity cost of management time, or the cost of raising capital in the market for this purpose;
— alternatively, impairment to the franchise value as the company ceases to be able to write new business in current volumes and on profitable terms; and
— worsening lapse experience (although this may increase shareholder value) and expense experience (including the increased cost of professional advice).

B.2.5.8.6 *Agency costs*

This represents the markdown to value which shareholders apply on a company's shareholder capital, because they do not have direct control over its use.

B.2.5.8.7 *Cost of raising capital in the market*

If an insurance company were to need to raise capital in the market, this would, typically, require the capital to be raised at a discount to the market price. Some users of MCEV do not believe that the costs of raising capital in the market form a distinct frictional cost; instead, they reflect the overall return required by investors in this capital. This information can be used to help calibrate, or provide a check, on some of the elements of the economic balance sheet, including the frictional costs.

B.2.6 *Economic value*

The economic value of the company equals the total assets of the economic balance sheet, less the total liabilities (including policyholder liabilities, pension scheme deficit, debt, current liabilities and frictional costs). Many believe that this economic value framework is valuable in helping the user gain greater understanding of the drivers of value creation and destruction.

B.2.7 *Should economic value equal market capitalisation?*

B.2.7.1 Some believe that, when determining an economic balance sheet, a useful way of calibrating the more difficult assumptions is to ensure that overall economic value equals the market capitalisation of the company at the valuation date.

B.2.7.2 Others believe that it is useful to calibrate all of the assumptions underlying the economic value independently of the market capitalisation of the company, and then compare the resulting economic value with the

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market capitalisation. Differences would imply that some of the assumptions have not been set appropriately, and/or that the market capitalisation of the company does not reflect the economic value of the company.

B.3 *What is MCEV?*

B.3.1 MCEV draws on corporate finance, financial economics and modern portfolio theory, underlying the economic balance sheet, to develop a more robust financial reporting and performance management framework for life assurance companies.

B.3.2 From a financial reporting perspective, MCEV forms a subset of the economic balance sheet, and there are differing views on which subset. It is generally accepted that the following elements of the economic balance sheet form part of MCEV:

— market value of tangible assets;
— tax shields;
— market-consistent value of policyholder liabilities (100% credit risk free);
— pension scheme deficit;
— debt and current liabilities;
— cost of double taxation and investment expenses;
— tax asymmetries; and
— regulatory capital costs.

However, it is not generally accepted how all these items should be calculated or presented.

B.3.3 The franchise value does not form part of MCEV. Instead, for a company open to new business, financial reporting provides information about the market-consistent value of recently written new business (MCVNB).

B.3.4 There is a debate as to whether some elements of the economic balance sheet should form part of the MCEV, including:

— limited liability put option;
— cost of financial distress;
— agency costs; and
— cost of raising capital in the market.

We address this debate later, in Sections B.7 and B.13.

B.4 *MCEV: Methodology and Assumption Issues to Resolve*

B.4.1 When a company is developing and implementing MCEV, there are a number of issues to resolve around the methodology and assumptions. How these are resolved depends, *inter alia*, on the purpose of the valuation and what the user is trying to achieve. In this working party, we are focusing on external financial reporting of MCEV, however, other important purposes which deserve consideration include:

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— financial management;
— internal performance measurement;
— product pricing;
— mergers and acquisitions; and
— determining shareholder capital requirements.

It may be appropriate to include different elements in an MCEV for each purpose.

B.4.2 We believe that, in many circumstances, the differences arising from these issues are not as material to the result as the implicit differences that may have been prevalent between valuations under the traditional embedded value methodology.

B.4.3 For all the above purposes, we believe that it is important for any use of MCEV to include:

— the disclosure of the approach taken — particularly in areas of debate;
— the use of sensitivities to help the users, who may then adjust the MCEV result to reflect their own preferred point of view; and
— an analysis of MCEV movement, to help the users understand the drivers of value creation and destruction.

B.4.4 The balance of this section discusses the issues around MCEV implementation, including (with the subsections where these are discussed in parentheses):

— the various ways in which one can present and calculate MCEV (Section B.5);
— the various modelling techniques available to calculate MCEV (Section B.6);
— the allowance for own credit risk in MCEV (Section B.7);
— the allowance for the liquidity premium in MCEV (Section B.8);
— the discount rate used in MCEV (¶B.9);
— the choice of the risk free rate assumption to be used in MCEV (Section B.10);
— how to value the MCEV of participating business (Section B.11);
— the market-consistent value of recently written new business (Section B.12);
— which frictional costs to allow for in MCEV (Section B.13);
— the allowance for diversifiable risk in MCEV (Section B.14); and
— the analysis of movement and sensitivities in MCEV (Section B.15).

B.5 *Ways of Presenting and Calculating MCEV*

B.5.1 There are various ways of presenting and calculating MCEV, and three such approaches are described below. It can be shown that these different ways of presenting and calculating MCEV are equivalent, if they allow for items such as the frictional costs in a consistent manner.

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B.5.2 The form of the economic balance sheet provided in Table B.1 is familiar to the accounting profession, with assets on the left hand side, and liabilities and the balancing item on the right hand side. MCEV can also be presented in a similar manner, and so is consistent with the fair value presentation, as described in IASB (2001).

B.5.3 The traditional embedded value has typically been presented and calculated as adjusted net worth plus value of in force less cost of capital. Note that this latter item is generally not the same as the frictional costs discussed above. It is possible to present MCEV using the adjusted net worth, plus value of in force, less frictional costs, approach, provided that appropriate market-consistent methodology and assumptions are used to determine the market-consistent value of in force (MCVIF).

B.5.4 A third approach is also possible within a market-consistent stochastic simulation model, where the present value of all distributable earnings (PVDE) is determined. These earnings include those arising from the adjusted net worth and those arising from the value of in force, without distinguishing between the two.

B.5.5 It is possible to calculate MCEV using one approach, and present the results using another approach.

B.6 *Techniques Available to Calculate MCEV*

B.6.1 There are various techniques or modelling tools available to calculate MCEV. The more frequent techniques used in practice can be grouped into:

— stochastic Monte Carlo simulation; or
— a deterministic approach for non-option cash flows, and a stochastic approach for financial option cash flows.

B.6.2 *Stochastic Monte Carlo simulation*

Acceptable simulation approaches include either the real world deflator approach or the risk neutral approach.

B.6.3 *Deterministic approach for non-option cash flows and stochastic approach for financial option cash flows*

B.6.3.1 This approach uses a mixture of deterministic and stochastic techniques to determine MCEV. For this purpose, 'non-option cash flows' can be defined as cash flows whose values vary linearly with market movements. Care should be taken in judging which cash flows may be classified as 'non-option cash flows'. Many cash flows, which appear not to contain embedded financial options, may be non-linear in form, for example tax asymmetries. Materiality should be a key consideration in this judgement, and symmetric sensitivity testing can help in this regard.

B.6.3.2 Acceptable deterministic approaches are numerous, and include

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cash flow specific discount rates applied to best estimate cash flows and the certainty equivalent approach.

B.6.3.3 Acceptable stochastic approaches are numerous, and include Monte Carlo simulation, closed form solutions and numerical integration.

B.6.4 *Calibrating the techniques used to market data*

Calibration of the techniques to market data is an important step in MCEV. We discuss the choice of risk free rate in Section B.10, but other calibration requirements are out of the scope of this paper. For discussion on market-consistent calibration, see Dullaway & Needleman (2004), Dullaway & Smith (2004), Hare *et al.* (2004), GN45 (2004), GN47 (2004), Muir & Waller (2003) and Sheldon & Smith (2004). There are many areas where market data do not provide sufficient information to calibrate these techniques. For examples, see GN47 (2004), Muir & Waller (2003) and Sheldon & Smith (2004). In these areas, model risk and parameter risk can arise.

B.6.5 *Comparison of methods*

Each of the above methods has its advantages and disadvantages when used in an MCEV. Use of more than one method can help check the reasonability of the result. Criteria with which to judge these methods include:

— ability to cope with management actions and policyholder behaviour;
— practicality;
— auditability; and
— materiality.

Further discussion is outside the scope of this paper, but we refer the interested reader to Abbink & Saker (2002), Boyle & Hardy (1997), Coulthard & Sheldon (2001), Dullaway & Needleman (2004), Foroughi *et al.* (2003), Foroughi & Whitlock (2003), Hairs *et al.* (2002), Hibbert *et al.* (2001), Hibbert & Turnbull (2003), Jarvis *et al.* (2001), GN47(2004), Mills (2002a, 2002b), Muir & Waller (2003), Sheldon & Smith (2004) and Waller & Abbink (2003).

B.7 *Allowance for LLPO in MCEV*

B.7.1 An area of debate within the actuarial profession has been whether to allow for the LLPO in an MCEV.

B.7.2 Some believe that, in the interests of transparency, it should be encouraged that either: no allowance for the LLPO is made within an MCEV; or any allowance is separately disclosed.

B.7.3 Some believe that some allowance for the LLPO is reasonable within an MCEV, as an insurer's promises to policyholders are not 100% credit risk free, and this fact should be communicated both qualitatively and quantitatively in the MCEV. In such circumstances, this should be combined

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with disclosure of the assumptions and sensitivity information to help the user estimate the allowance for the LLPO.

B.7.4 Some believe that the LLPO should be considered in conjunction with the franchise value and the cost of financial distress, as these values are correlated, and can change significantly as an insurer approaches financial distress.

B.7.5 Possible ways of estimating the LLPO include:

— stochastically modelling the company as a whole, and building in a decision making process as to whether to, and when to, exercise the LLPO; and
— increasing upwards the risk free rate used to value the market-consistent value of policyholder liabilities from the 100% credit risk free rate.

The second method is practically easier, but more approximate than the first.

B.7.6 If the LLPO is to be shown by adjusting the discount rate in an MCEV, and assuming that policyholders rank above corporate debt holders on, or approaching, wind up, this adjustment should be less than the risk premium in the company's corporate debt.

B.7.7 For a well capitalised life insurer operating in a strongly regulated market, the LLPO may be expected to be immaterial.

B.8 *Allowance for the Liquidity Premium in MCEV*

B.8.1 Some believe that, as some insurance cash flows can be considered fairly certain in timing and amount, and so can be backed by illiquid assets held to maturity, there is a range of prices of possible replicating portfolios implicitly defining the market-consistent value of liabilities. At the lower end of the range (so it is believed) are replicating portfolios constructed with illiquid assets, and, therefore, it may be appropriate to reduce the market-consistent value of policyholder liabilities accordingly.

B.8.2 There are other points of view with regard to whether a liquidity premium exists, or, regardless of whether it exists, whether it should be capitalised in the economic balance sheet or an MCEV. Key reasons why it may not be appropriate to capitalise the liquidity premium in an MCEV include:

(1) Merton (1974) described a method of estimating an appropriate risk premium for corporate bonds, based on option pricing and equity volatility. The approach was based on arguments that the owners of a company issuing a corporate bond have the option to default, and this option is more likely to be exercised when share prices are low. Once this option is allowed for in a valuation, it may be that the liquidity premium is nil or very small, the significant majority of the difference between the corporate bond yield and the 100% credit risk free rate being explained by the risk aversion of investors.

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(2) It is debatable as to whether it is possible to construct a replicating portfolio using illiquid assets.
(3) In particular, very few, if any, liability cash flows are so certain that they could be perfectly matched with an illiquid asset. If some liquidity premium were to be capitalised in an MCEV, an unanticipated forced sale of illiquid assets would lead to a write down.
(4) If insurance companies and other institutions with long-term illiquid liabilities, such as pension funds, were to make up a significant component of the holders of illiquid asset stock, market yields would likely already reflect their own assessment of the risk of holding such stock.

B.8.3 Given the above, we believe that:
— in most circumstances, no liquidity premium should be capitalised in an MCEV; and
— if some liquidity premium were to be capitalised in an MCEV, this fact should be disclosed, along with the financial impact shown separately.

B.8.4 We do not consider the possible capitalisation of the liquidity premium further in this paper.

B.9 *Discount Rate used in MCEV*

Regardless of the technique used to calculate MCEV, Dullaway (2001) sets out the discounting approach within an MCEV, as follows:
— fixed cash flows are discounted at the risk free rate;
— diversifiable risk cash flows are discounted at the risk free rate;
— non-option cash flows, which vary linearly with market movements, are discounted at cash flow specific discount rates required to satisfy the principle of freedom from arbitrage, alternatively, the cash flows are risk adjusted to achieve the same objective; and
— option cash flows are valued using market-consistent stochastic techniques, as described in Section B.6.

We recognise that the choice of rate at which to discount diversifiable risk cash flows is a matter of debate, and discuss this in Section B.14.

B.10 *Choice of Risk Free Rate used in MCEV*

B.10.1 We consider that this section is valid for all embedded value methodologies.

B.10.2 It is clear, from the above discussion, that a critical assumption in an MCEV is the choice of risk free rate. Steps to determine this assumption include:
— forming a view as to the 100% credit risk free rate; and
— forming a view as to whether this should be used unadjusted or, alternatively, adjusted upwards, to implicitly reflect some LLPO.

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B.10.3 If it is accepted that some allowance for the LLPO is reasonable within an MCEV (cf. Section B.7), then the first step above may not be required for the calculation of MCEV.

B.10.4 *The 100% credit risk free rate*

B.10.4.1 The choice of the risk free rate in a market-consistent valuation has been a matter of much debate in the U.K. actuarial profession. Until recently, practitioners tended to choose either swaps or gilts. These choices and some backing rationale can be found in Dullaway & Needleman (2004) and Sheldon & Smith (2004), respectively.

B.10.4.2 Dullaway & Smith (2004) discuss the choice of a risk free rate in the calculation of FSA realistic liabilities. Summarised conclusions include:

— The 100% credit risk free rate is likely to lie above the gilt yield curve, due to 'a convenience yield of around ten basis points (bp)', assumed, for the purpose of the discussion below, to be at least 5bp.
— The 100% credit risk free rate is likely to lie below the swap yield curve, due to the LIBOR/LIBMID spread, and also the LIBMID/REPO credit spread. For the purposes of the discussion below, we assume that this overall impact is at least 10bp.

B.10.4.3 This would suggest that the true 100% credit risk free rate lies between gilts plus 5bp and swaps minus 10bp.

B.10.4.4 At valuation dates since 30 April 2002, swap spreads over gilts have generally been in the region 20 to 40bp. This would suggest that, in such circumstances and using the illustrative range above, the 100% credit risk free rate range is between 5 and 25bp. In some circumstances, this range may be narrow enough to be viewed not sufficiently material for further investigation.

B.10.4.5 At earlier valuation dates prior to 30 April 2002, the swap spreads over gilts have been at times 50 to 140bp, which, in most cases, is probably large enough to require further investigation.

B.10.4.6 It can be argued that the quality of swap contracts has improved since then, so earlier comparisons may not be strictly valid. However, there is a possibility that, at some future date, swap spreads over gilts will return to such high levels, in which case further investigation is recommended before any conclusions are reached.

B.10.4.7 There is also a possibility that, in the U.K., future swap spreads over gilts will reduce to below 20bp.

B.10.4.8 In some countries, the swap spreads over government bonds has been negative.

B.10.4.9 FSA (2004) requires FSA realistic liabilities, determined at 30 June 2004, to be calculated using a risk free rate no greater than gilts plus 5 to 10bp. This does not necessarily reflect the views of all as to the 100% credit risk free rate, and may include some prudence.

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B.10.4.10 This requirement will not necessarily apply to all future valuation dates, although, as is stated in GN45 (2004), it applies to the calculation of FSA realistic liabilities as at 31 December 2004.

B.10.4.11 The figures in the above discussion are only relevant to the MCEV of U.K. business, not overseas business.

B.10.5 *What risk free rate should be used in an MCEV?*

The choice of risk free rate in an MCEV depends on the views as to the 100% credit risk free rate, and whether this rate should be adjusted for some LLPO.

B.10.5.1 Some believe that the 100% credit risk free rate should be used in an MCEV, either because no allowance should be made in an MCEV for the LLPO, or because the effect of any such allowance should be disclosed separately.

B.10.5.2 Some believe that the use of swaps is justified in an MCEV, given current swap spreads, with the difference between swaps and the 100% credit risk free rate being some implicit allowance for the LLPO. As long as appropriate sensitivity information is provided, this implicit allowance can be estimated.

B.10.5.3 We note that this implicit allowance may be very different to the actual LLPO of an individual company.

B.10.5.4 It is more straightforward to calibrate the MCEV techniques used to the swap curve than the 100% credit risk free curve.

B.10.5.5 It is a more practical process for U.K. companies to use the same risk free rate assumption for FSA realistic liabilities and any MCEV calculation.

B.10.5.6 For U.K. companies with parents outside the U.K., if the choice of risk free rate lies with the parent, this practical process advantage may not be as relevant in determining the risk free rate assumption in the MCEV.

B.10.5.7 CFO Forum (2004) provides swaps as an example of a risk free rate that can be used in the European embedded value.

B.10.6 *Risk free rate assumption — level or curve?*

The above discussion implicitly assumes that the risk free rate is chosen using a market yield curve; however, users may wish to use a level risk free rate assumption. The validity of this approach will depend, *inter alia*, on the shape of the yield curve, the materiality of the assumption on the results, and how the level risk free rate assumption has been determined.

B.11 *Valuing the MCEV of Participating Business*

B.11.1 The MCEV of participating business (also referred to as with-profits business in the U.K.), and the techniques available for calculation, are of relevance to many U.K. life companies.

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B.11.2 The MCEV of participating business can be thought of as the valuation of shareholder transfers from a participating fund to a shareholder fund, less capital injections from a shareholder fund to a participating fund.

B.11.3 Dullaway & Bice (2002) show that, under certain assumptions, it is possible to determine a good first order approximation to the MCEV of a participating fund by the use of formulaic methods. One particular assumption required is that the burn through cost liability is not material.

B.11.4 The burn through cost (also known as cost of estate burn through) liability refers to the liability to shareholders arising from being required to inject capital into a participating fund at a future date, if regulatory assets are not sufficient to meet regulatory liabilities.

B.11.5 We note that a participating fund can appear solvent under FSA (2004), and yet still have a burn through cost liability within an MCEV. This is due to the fact that the purposes of the valuations differ. In particular:

(1) The realistic balance sheet is trying to answer the question: "Given the form of liabilities within the participating fund, is the value of assets within the participating fund sufficient to purchase a theoretical hedge at the valuation date?"
(2) The MCEV of participating business is trying to answer the question: "Given that this hedge is not purchased, and the assets and liabilities within a participating fund are mismatched, what are the implications for the shareholder value of the participating fund?" This question also drives the need for a realistic capital margin to be held on top of the realistic balance sheet, a requirement which, if met from within the with-profits fund, reduces, but does not necessarily remove, the existence of the burn through cost liability.

B.11.6 Dullaway & Needleman (2004) discuss the benefits of presenting the realistic balance sheet using the call option approach, as opposed to the more frequently used put option approach. One main benefit of the call option approach is to help estimate the MCEV of a participating fund, excluding the burn through cost liability.

B.11.7 There are many other important considerations in determining the MCEV of a participating fund; these are outside the scope of this paper.

B.12 *Market Consistent Value of New Business*

B.12.1 For a company open to new business, under a market-consistent embedded value financial reporting framework, the company will probably be reporting both MCEV and MCVNB. Under such circumstances, most assumptions underlying the calculation of MCEV should implicitly assume that the company continues to be open to future new business.

B.12.2 There are several considerations when calculating both MCEV and MCVNB, some of which are briefly described as:

(1) Should the MCVNB be calculated as a point of sale value or value at

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the valuation date? There are practical difficulties in calibrating to more than one valuation date simultaneously in a market-consistent valuation.

(2) Should the MCVNB be calculated as a stand alone value or as the marginal impact on MCEV? There can be differences in result from influences such as tax, expenses and optionality within participating funds.

(3) How should management actions be allowed for in the MCEV and MCVNB, and should they be consistent? This has particular relevance in the calculation of burn through cost in a participating fund.

B.12.3 A deeper discussion of these and other MCVNB considerations is outside the scope of this paper.

B.13 *Frictional Costs in MCEV*

B.13.1 The main considerations when determining the frictional costs in an MCEV are:

— which frictional costs to apply;
— to which capital quantum to apply the frictional costs; and
— what rate of frictional costs to apply.

We consider these below.

B.13.2 *Which frictional costs should be applied?*

There is debate as to which frictional costs of capital (as listed in Table B.1) should be allowed for within an MCEV.

B.13.2.1 Some believe that, for external financial reporting, no frictional costs should be disclosed. One point lending support to this view is that such information is not disclosed in the external financial reporting of other industries. This view is encouraged in IASB (2001).

B.13.2.2 Some believe that the cost of double tax and investment expenses should be allowed for in external financial reporting. Points lending support to this view include:

— some such allowance was always implicit within the traditional embedded value cost of capital methodology; and
— this item forms a cash flow on the primary accounting balance sheet, and, if not capitalised in the MCEV, will lead to an unexpected loss in the analysis of MCEV movement each year.

B.13.2.3 Some believe that agency costs and the cost of financial distress should not be allowed for in external financial reporting, and, instead, users of the information should apply their own discount in this respect. One point lending support to this view is that a user, not familiar with MCEV and its background, may apply an additional discount.

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B.13.2.4 Some believe that agency costs and the cost of financial distress should be allowed for in external financial reporting, as, without such information, users may apply too much of a discount. Such information may also provide useful indication as to the management strategy of the company.

B.13.2.5 Some believe that, for internal financial reporting and value transfers, an allowance should be made for agency costs and the cost of financial distress.

B.13.2.6 For a well capitalised insurer operating in a well regulated market, the cost of financial distress may be expected to be small. Nevertheless, this item is useful to consider, for example in the risk management area, to ensure that franchise value is protected.

B.13.2.7 Some believe that, where the main cost of financial distress lies with protecting the franchise value, the cost of financial distress should be applied to the MCVNB.

B.13.2.8 Some believe that the cost of financial distress should be applied to MCEV, even if the main cost lies with protecting the franchise value, as this is consistent with viewing the MCEV on an open to new business basis.

B.13.2.9 Some believe that the cost of financial distress should be applied as a haircut to the new business multiplier, if the MCEV and MCVNB information is being used to determine a market-consistent appraisal value.

B.13.2.10 Some believe that sensitivity information should be provided to help users estimate a discount for agency costs and the cost of financial distress.

B.13.3 *To which capital quantum do the frictional costs apply?*

B.13.3.1 As far as we are aware, there is not a universally agreed methodology to-date to help determine the capital quantum to which to apply the frictional costs.

B.13.3.2 When considering this question, it may be helpful to differentiate between two capital concepts, available (shareholder) capital and required (shareholder) capital. The former is related to value, whereas the latter is related to risk.

B.13.3.3 At the valuation date, it may be expected that available capital exceeds required capital, in which case, it may be appropriate, in the MCEV, to assume that the difference is released soon after the valuation date.

B.13.3.4 For an open company, many believe that the level of required capital in the MCEV should be determined, based on the assumption that the company continues to write future new business.

B.13.3.5 Some believe that the cost of double taxation, double investment expenses and agency costs should be applied to a function of required capital.

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B.13.3.6 Some believe that a higher level of agency costs should also be applied to available capital in excess of required capital.

B.13.3.7 Some believe that the cost of financial distress should be applied to a function of capital injections possibly required in future, which occur in scenarios and time periods where required capital exceeds available capital, for example due to adverse events.

B.13.4 *What rate of frictional costs applies?*

B.13.4.1 As far as we are aware, there is not a universally agreed methodology to-date to help determine the rate of frictional costs to apply in an MCEV.

B.13.4.2 In theory, the level of frictional costs to apply will depend on the perspective of each individual investor. However, it may not be practical to model or present all such variations.

B.13.4.3 In theory, the appropriate rate of cost of double tax and investment expense may be the additional tax and investment expense outgo experienced by an investor in assets through the insurance company structure, as compared to those held directly.

B.13.4.4 One practical approach may be to assume that the investor is able to avoid material tax and investment expense on assets held directly. In such circumstances, it may be appropriate to assume that the frictional cost rate of double tax and investment expenses in an MCEV is the total incurred by the company.

B.13.4.5 An appropriate rate of financial distress costs may be set with regard to the cost of raising capital for this purpose in the market, or with regard to the views of the company's parent or risk management function.

B.13.4.6 An appropriate rate of agency costs may be set with reference to the views of the company's parent or risk management function, or recent M&A transactions.

B.14 *Allowance for Diversifiable Risk in MCEV*

B.14.1 There are several areas of the valuation where diversifiable risk may impact an MCEV result, including:

— the choice of rate to discount diversifiable risk cash flows;
— the choice of diversifiable risk projection assumptions; and
— the impact from the frictional costs.

We discuss the first two in more detail below.

B.14.2 We consider that the allowance for diversifiable risk in an MCEV should be assessed in aggregate.

B.14.3 We note that some cash flows may contain a mixture of diversifiable risk and market risk, but do not consider this further in this paper.

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B.14.4 We note that Abbink & Saker (2002), Hairs *et al.* (2001), IASB (2001) and Smith *et al.* (2003) provide further discussion on this topic.

B.14.5 *Choice of rate to discount diversifiable risk cash flows*

B.14.5.1 As indicated in ¶B.9, the use in an MCEV of the risk free rate to discount diversifiable risk cash flows is encouraged by some, but is a matter of debate for others.

B.14.5.2 An alternative would be to adjust the discount rate for diversifiable risk cash flows. Such an adjustment would be upwards for positive cash flows to shareholders, and downwards for negative cash flows to shareholders.

B.14.5.3 Some believe that this adjustment has merit when valuing business where diversifiable risk has a more significant impact on the value than market risk.

B.14.6 *Choice of diversifiable risk projection assumptions*

B.14.6.1 When valuing diversifiable risk cash flows, the choice of projection assumptions may have a much greater impact on value than the choice of discount rate.

B.14.6.2 Some believe that best estimates should be used for diversifiable risk assumptions in an MCEV.

B.14.6.3 We note that, in theory, the definition of best estimate for an MCEV should be based on the mean of the cash flows that would arise if the diversifiable risk distribution were modelled stochastically, and not the mean or median of the diversifiable risk distribution itself.

B.14.6.4 Two examples where the 'mean of the cash flows' definition of best estimate is more prudent than the alternatives above are:

— where the diversifiable risk distribution is skew, with the tail leading to greater shareholder losses; and
— where the impact on shareholder value of symmetric variations in the risk distribution is skew, for example if there is embedded optionality in the insurance contract (e.g. mortality optionality within guaranteed annuity rates), or if the impact on the frictional costs applied in the MCEV is skew. If material, in such circumstances, stochastic modelling of the diversifiable risk distribution may be recommended.

B.14.6.5 This definition may, or may not, be used currently, when setting and reviewing projection assumptions, say for use in traditional embedded value.

B.14.6.6 However, this definition strictly requires the review of all traditional embedded value assumptions for use in MCEV; this is clearly not practical. A practical work around may be to use traditional embedded value assumptions for MCEV in the short term, and to revise these assumptions ordered by materiality going forwards on a similar basis.

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B.14.6.7 Some believe that best estimates should not be used for diversifiable risk assumptions in all cases; instead, where possible, these assumptions should be set with reference to market prices available to transfer such risks. For example, mortality assumptions can be set with reference to reinsurance rates, and expense assumptions can be set with reference to third party administration fees.

B.14.6.8 However, we believe that market prices are not appropriate if frictional costs are also being applied, as:

— use of market prices implicitly assumes that some diversifiable risk is removed from the economic balance sheet. Without allowing for the resulting reduction in the capital requirements, there will be double counting of the cost of diversifiable risk; and
— market prices will include distortions from the third party's economic balance sheet, in particular frictional costs, so there may be double counting of the cost of diversifiable risk.

B.14.6.9 Some believe that it is appropriate to adjust diversifiable risk projection assumptions prudently away from best estimate, for the purpose of calculating an MCEV. Such an adjustment is referred to, in IASB (2001), as a market value margin.

B.14.6.10 Reasons why it may not be appropriate to adjust the discount rate away from the risk free rate, or the choice of diversifiable risk projection assumptions away from best estimate include:

— Financial economic theory argues that no such adjustments, other than frictional costs, are appropriate for diversifiable risks, as any increased reward would be competed away.
— If frictional costs are also being applied, there will be double counting of risk adjustment.
— These adjustments may not enable diversification benefits across different insurance risks to be recognised.
— These adjustments may not be consistent across companies.
— These adjustments may be used as a profit smoothing device.
— These adjustments make financial reporting more opaque.

We do not consider the allowance for diversifiable risk further in this paper.

B.15 *Analysis of Movement in MCEV and MCEV Sensitivities*

B.15.1 The development of the analysis of movement in MCEV and MCEV sensitivities helps provide the user of MCEV information with useful business information.

B.15.2 There are various possible approaches to both the analysis of movement in MCEV and MCEV sensitivities. Some can be found in AMP (2003), Coulthard & Parkes (2004), Foroughi & Whitlock (2003), Hancock *et al.* (2001), HHG (2004) and True & Coulthard (2004).

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B.15.3 The various approaches to the analysis of movement of MCEV generally follow the principle of separating the analysis into insurance earnings and investment earnings. The insurance earnings are assessed on the basis that no investment risk has been taken, in other words, a replicating portfolio of assets is held to match the liabilities. The investment earnings are assessed on the basis that a conscious decision has been made to mismatch, in the hope of generating additional MCEV profits in future.

B.15.4 We expect standardisation of approaches to develop going forward, and do not consider the analysis of movement in MCEV or MCEV sensitivities further in this paper.

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APPENDIX C

COMPARISON OF GEDDES, ABI ACHIEVED PROFITS AND EEV METHODS

	Geddes working party	ABI achieved profits	EEV Principles
C.1 Purpose of the valuation	The terms of reference relate purely to the determination of a value. They do not address profit recognition and disclosure, although they admit that the method "has validity for profit recognition within a proprietary life office".	The 'achieved profits' method is for reporting the shareholders' profits from long-term insurance business. The corresponding balance sheet presentation is for use in supplementary reporting in accounts of proprietary insurance companies or in consolidated accounts of proprietary insurance groups.	Embedded value (EV) is a measure of the consolidated value of shareholders' interests in the *covered business*. The *EVM* is to be applied to *supplementary reporting* in the accounts of proprietary companies that transact certain types of business.
C.2 Definition	There was no universal definition at the time when the paper was written. The working party defined embedded value as: (a) the discounted value of those present and future surpluses which are expected to be generated in respect of presently in-force business within the statutory long-term business fund, and to be transferable (after allowing for all relevant taxes) to profit and loss account; and (b) the value of net assets held outside the long-term business fund which are available for the purposes of the company's long-term business.	The application of the achieved profits method results in the recognition of the achieved profits shareholders' funds. This comprises the present value of the shareholders' interest in the long-term business contracts and related shareholders' net assets.	EV is the *present value* of shareholders' interests in the earnings distributable from assets allocated to the *covered business* after sufficient allowance for the aggregate risks in the *covered business*. The EV consists of the following components: — *free surplus* allocated to the *covered business*; — *required capital*, less the cost of holding *required capital*; and — *present value* of future shareholder cash flows from in-force *covered business* (PVIF).

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	Geddes working party	ABI achieved profits	EEV Principles
C.3 Future/last year's new business	The potential value of future new business should be excluded from the embedded value. The calculation of the embedded value should ignore the potential effects of future new business on the incidence of taxation and the expected timing of the emergence of transferable surplus.	Any goodwill value arising from the capacity to write new business in the future is excluded. In projecting the future tax liabilities from in-force business on a going concern basis, no credit should be taken for any reduction in taxes which is properly attributable to future new business.	The value of future new business is excluded from the EV. New business is defined as that arising from the sale of new contracts during the reporting period. The value of (last year's) new business includes the value of expected *renewals* on those new contracts and expected future contractual alterations to those new contracts. The PVIF should anticipate *renewal* of in force business, including any *reasonably predictable* variations in the level of *renewal* premiums.
C.4 Net assets	Net assets held outside of the long-term business fund would normally be included at their balance sheet values.	Assets are attributed as either backing the long-term insurance contracts or residual assets. The accounting for the residual assets should follow generally accepted accounting principles and provision should be made for taxation.	The *free surplus* is the market value of any capital and surplus allocated to, but not required to support, the in-force *covered business* at the valuation date.
C.5 'Locking-in' of assets	The majority felt that it is inappropriate that assets which represent the statutory minimum solvency margin should be revalued on bases consistent with the valuation of long-term business surpluses, in recognition of the fact that they are not distributable.	The achieved profits method recognises capital and reserves which are encumbered by the requirements of the local supervisors. The cash flow, from these assets should be projected, and their net present value ascertained on a basis consistent with the other achieved profits projection assumptions.	*Required capital* should include any amount of assets attributed to the *covered business*, over and above that required to back liabilities for *covered business*, whose distribution to shareholders is restricted. The EV should allow for the cost of holding the *required capital*, as the difference between the amount of

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	Geddes working party	ABI achieved profits	EEV Principles
	A minority disagreed with this view. The practice was not precluded, but the nature and effect of such revaluation should be fully disclosed.	*In practice, a variety of practices appear to be adopted, with some companies not re-valuing encumbered capital and others using 'free' with-profits surplus to mitigate the cost of encumbered capital.*	*required capital* and the *present value* of future releases, allowing for future investment return, of that capital.
C.6 Valuation basis	The surpluses to be valued would normally be those which will emerge on the basis of the present published liability valuation methods and standards. Any other basis (e.g. statutory minimum) would require full disclosure.	The starting point in determining the present value of the shareholders' interest is the long-term business provisions calculated in accordance with the current local supervisory requirements, which should be assumed to continue, unless modifications are necessary for consistency with other assumptions or in anticipation of reasonably certain legislative changes.	The value of future cash flows from in-force *covered business* is the *present value* of future shareholder cash flows projected to emerge from the assets backing liabilities of the in-force *covered business* (PVIF), reduced by the time value of *financial options and guarantees*, as defined in Principle 7.
C.7 The (risk) discount rate	Should represent the net of tax investment return required by shareholders on their investment in the long-term business activity (excluding investment in future new business acquisition). Should be determined by the representatives of the shareholder, after taking the advice of the actuary. Should not be lower than the net investment return assumed to be earnable on new money.	The risk discount rate (or rates): — reflects the current market assessment of the time value of money and the risks associated with the in-force portfolio, including risks from any mismatch between assets and liabilities and the market driven volatility of future cash flows; — is applied to net of tax cash flows, and should be expressed as an after tax rate;	Discount rates used to determine the *present value* of future cash flows should be set equal to *risk free rates* plus a risk margin. The risk margin should reflect any risk associated with the emergence of distributable earnings that is not allowed for elsewhere in the valuation. Valuation of financing types of reinsurance and debt, including subordinated and contingent debt, should ensure that the combined

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	Geddes working party	ABI achieved profits	EEV Principles
	A standard discount rate may be adopted, which ignores changes in market conditions or a dynamic approach under which the rate is altered at each valuation.	— should be consistent with risk discount rates used by management for other purposes, such as profit testing current products or as the basis for internal hurdle rates; and — is meant to give the margins for risk which a third party, operating in a similar tax and regulatory regime, would require in order to assume the liabilities and supporting assets.	impact of their servicing costs and discount rates assumption does not distort the valuation of the underlying business. Risk discount rates may vary between *product groups* and territories.
C.8 Margin for risk	The discount rate used to discount best estimate surplus flows may contain a margin for risk. Alternatively, the risk inherent in the business may be accounted for by deducting a margin from the surpluses to be discounted, and a lower discount rate used to produce a similar result. Discount rates may vary according to the type of business involved (e.g. closely matched income bonds might have a lower rate than term assurances).	These are determined by three factors: — the risk premium in the discount rate; — the strength of the provisions and additional encumbered assets; and — any explicit margins to allow for uncertainty unrelated to the passage of time and hence reflected in an adjustment to expected cash flows. Their application should be consistent between accounting periods and between portfolios of business. They are not expected to vary significantly from year to year, and should not vary solely due to the size of the portfolio.	The EV should reflect the aggregate risks in the *covered business*. For example, interactions should be considered between explicit allowances for *financial options and guarantees*, the prudence of the liability valuation, the level and cost of *required capital* and the risk discount rate. Their combined impact should, *inter alia*, be sufficient to allow for both *financial options and guarantees*, and the cost of holding *required capital* to support any mismatching of assets and liabilities.

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	Geddes working party	ABI achieved profits	EEV Principles
C.9 Mismatching, maturity guarantee and other contingency reserves	To the extent that these provide reserves in respect of low probability risks, for which margins are included, either in the discount rate or as reductions in the expected surplus flows, the reporting actuary may assume the release into surplus of such reserves, the timing of such releases to have regard to any statutory requirements for such reserves to be maintained.	As these reserves are included in the actuarial statutory solvency liabilities, the projection assumption that the current basis for calculating the statutory technical provisions should be assumed to continue naturally leads to a run-off of these reserves as the business matures.	Not specifically mentioned, though expected to be treated as any other reserve held.
C.10 Recognition of costs from options and guarantees	Not specifically mentioned.	Mentioned as an item for consideration.	Allowance must be made in the EV for the potential impact on future shareholder cash flows of all *financial options and guarantees* within the in-force *covered business*. This allowance must include the *time value* of *financial options and guarantees*, based on *stochastic techniques*, consistent with the methodology and assumptions used in the underlying embedded value. The valuation of *financial options and guarantees* should take, as a starting assumption, the actual asset mix at the valuation date.
C.11 Experience/ projection assumptions	Should not be inconsistent with the company's recent experience and general economic conditions. Should be consistent with each other. Should be chosen with a	Should be determined using realistic assumptions of each component of future cash flow, for each policy group. It is reasonable to take account of	Should have regard to past, current and expected future experience, and to any other relevant data. Changes in future experience

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	Geddes working party	ABI achieved profits	EEV Principles
	degree of prudence, commensurate with the degree of uncertainty involved and the financial effect of possible variances.	the average experience of contracts within policy groups. Should have regard to past, current and expected future experience and any relevant external data. Regard should also be had to assumptions currently used for other purposes, such as profit testing new contracts. Favourable changes in experience should not be anticipated, unless they are reasonably certain to be delivered. There should be an underlying assumption that the enterprise is a going concern.	should be allowed for ... when sufficient evidence exists and the changes are reasonably certain. Should be *actively reviewed.* Should be determined using *best estimate assumptions* of each component of future cash flow for each policy group. Relevant data can be internal to the company or external, for example from experience analyses or inputs to pricing bases. Should be internally consistent and consistent with other forms of reporting (e.g. those used for results on statutory, pricing or GAAP bases). Should, where appropriate, be based on the *covered business* being part of a going concern. Should be *actively reviewed*, and updated, as appropriate, at least annually.
C.12 Lapse/ surrender/ discontinuance rates	Use an analysis of the company's recent lapse rates as a reasonably reliable guide to the future. If not available/reliable, then industry levels appropriate to the office's distribution system and type of business could be used. Rates should be selected with an element of conservatism. Comparative results, based on	Besides general guidance on experience assumptions (realistic assumptions), only additional guidance is that, where not guaranteed, terms for surrender, transfer or conversion to paid-up will be determined having regard to policyholders' reasonable expectations. Discontinuance experience is noted as a major	Appropriate allowance should be made in the value of in-force business for demographic assumptions, such as mortality, morbidity, *renewals* and future levels of withdrawals of in-force business. Such allowance should be based on past evidence and expected future experience, consistent with the assessment of other projection assumptions.

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	Geddes working party	ABI achieved profits	EEV Principles
	actual current experience or industry standard levels, should always be provided if the basic assumptions are more optimistic than current experience.	determinant of profitability for many policy types.	
C.13 Mortality/ morbidity rates	Mortality rates can be predicted with reasonable certainty. Care was needed about AIDS reserves.	No specific guidance; covered by general guidance on experience assumptions.	Appropriate allowance should be made in the value of in-force business for demographic assumptions, such as mortality, morbidity, *renewals* and future levels of withdrawals of in-force business. Such allowance should be based on past evidence and expected future experience, consistent with the assessment of other projection assumptions.
C.14 Maintenance expenses	The full level of expenses currently being incurred should be accounted for. Expenses currently being incurred must be allocated between: (a) those which relate to acquiring business; (b) those which relate to the in-force business; and (c) any balance of temporary over-run expense which can be clearly identified as of a purely temporary nature. The element which it is most important not to understate is the level of on-going maintenance expense.	The assumptions should reflect ongoing expense levels, including investment in systems required to support the operating assumptions. Assumed expense levels should be consistent with any pension scheme surplus/deficit on the company's balance sheet, and the profit sharing rules of the company. Development costs associated with investment in building a new enterprise over a defined period may be identified and accounted for separately. If no new business of a particular	Future expenses ... should reflect the expected ongoing expense levels required to manage the in-force business, including investment in systems required to support that business and allowing for future inflation. Overheads should be allocated between new and in-force business in an appropriate way, consistent with past allocation, current business plans and future expectations. *Holding companies'* operating expenses should be allocated in an appropriate way. All expected expense overruns

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	Geddes working party	ABI achieved profits	EEV Principles
	The argument that embedded value should be based on a theoretical level of expense, that would apply in a closed fund situation, was rejected as inconsistent with a going concern basis.	category, or for the company as a whole, is being written, revised projection assumptions may be appropriate.	affecting covered business, including *holding company* operating expenses, overhead costs and development costs, such as those incurred in start-up operations, must be allowed for.
C.15 Expense inflation	The assumed rate of expense inflation can be derived from current levels and longer-term assumptions regarding price inflation and earnings inflation. This may be adjusted to ensure consistency with other assumptions.	No specific guidance on assumption setting; the expense inflation rate is one of the items specified to be disclosed. *In practice, most companies use rates derived from the real yield on an index-linked gilt, adjusted for expense inflation being salary, and not price, related.*	Costs of managing the *covered business* incurred within *service companies* are to be valued on a *'look through' basis*, so as to give a *best estimate* of the impact on future shareholder cash flows of the expenses to the group of running the *covered business*. (This entry covers both C.14 and C.15.)
C.16 Investment returns	Assumptions of investment returns for fixed-interest investments and income yield of equity investments are relatively straightforward. Views varied on the extent to which movements in capital values should be reflected in earnings. The two views are: (a) Equity dividends will grow at a rate close to the historical growth rate. Capital values will progress to a value that bears a historical average relationship with income yields, and thereafter grow at the dividend growth rate.	Future investment returns for fixed interest should reflect the actual portfolio. The cash flow projected should be the anticipated income from current investments. Re-investment either has regard to the yield curve or is approximated by assuming current returns are applied to the market value of assets. Projected returns from fixed and index-linked investments should be adjusted for the risk of default, but not liquidity. When a future equity return assumption is required, this should be based on such returns	Economic assumptions must be internally consistent, and should be consistent with observable, reliable market data. No smoothing of market or account balance values, unrealised gains or investment return is permitted. Assumed investment returns should reflect the expected future returns on the assets held, and allocated to the *covered business* at the valuation date. The assumed returns should allow for any credit risk on investments. Assumptions for the reinvestment of future positive cash flows should be based on the expected

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	Geddes working party	ABI achieved profits	EEV Principles
	(b) Dividends and capital values will grow at a constant rate, giving a total yield (based on current market value) consistent with other assumed investment yields.	generating a margin over the corresponding risk free return. For unit-linked business, the assumed growth rates of unit values should be consistent with the investment returns assumed for the underlying asset types. There is nothing specific on the asset mix backing with-profits.	future investment strategy, consistent with other projection assumptions. Assumptions can allow for future switching between investment classes, where this is expected to occur and is in line with an investment strategy with formal board approval. The approach used in selecting fixed-interest assumptions for current assets and new money should consider the current investment portfolio and gross redemption yields.
C.17 Taxation	Necessary to determine, on the base of projected surpluses, whether taxes will be levied on Notional Case 1 or 'I-E' basis. The working party was divided on the extent to which an embedded value calculation might reasonably ignore any consequences of excluding future new business, without anticipating profit which should properly be attributed to new business as it is written.	The projections must allow for tax. Allowance should be made for all taxes, both under Schedule D Case VI on pensions, as well as taxes on income and gains generally. For tax on with-profits, it should normally be assumed that the whole of the undistributed surplus will be distributed by way of bonus. No credit should be taken for any reduction in taxes which is properly attributable to future new business. Achieved profits are computed on an after tax basis, and should be grossed up to pre-tax level for	Allowance in the projection must be made for all taxes and regulations in the relevant jurisdiction affecting the *covered business*. These should follow the local treatment, and be based on *best estimate assumptions,* applying current legislation and practice, together with known future changes.

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	Geddes working party	ABI achieved profits	EEV Principles
		presentation in the profit & loss account at the effective rate (normally the full rate of corporation tax).	
C.18 Participating (with-profits) business	The logical approach requires the calculation of the embedded value to take into account the bonus distribution policy. The actuary should also take account of the reasonable expectations of the with-profits policyholders. When comparing assets with liabilities, there could be a shortfall or excess of assets above any target that the office might have. In the case of a shortfall, the actuary would ask the directors to reconsider their bonus philosophy under the economic assumptions used, and would recalculate the embedded value to eliminate the deficiency. The treatment of an excess gave rise to various views. If excluding the recognition of profits arising from future new business ... excess assets can be regarded as distributable in line with assumptions of increased future bonuses. Where, in practice, excess assets would be used to subsidise future new business, two possible treatments are:	Where participating (with-profits) business is written within the long-term fund ... the transfer from the long-term fund ... is usually related directly to the cost of the policyholder bonuses in terms of the statutory solvency provision generated by such bonuses. Bonus assumptions should be consistent with assumed investment returns, the company's bonus philosophy and anticipated practice. If alterations in the levels of bonus are foreseen, then projections should reflect the anticipated levels. Continuation of the current (shareholders') proportion of profits should be assumed, except where an intended change has been announced or it appears unlikely that it will be sustained in future periods. Any free assets, which would normally be retained with in a fund, ... should be evaluated by assuming, for this purpose only, that terminal bonuses are increased to exhaust all such free assets.	For *participating business*, the method must make assumptions about future bonus rates and the determination of profit allocation between policyholders and shareholders. These assumptions should be made on a basis consistent with the projection assumptions, established company practice, and local market practice. Where regulatory/contractual restrictions or bonus participation rules are clear, they should be applied to projections of *participating business*. Projected bonus rates should be consistent with the assumed future investment returns used. Where the company has an established bonus philosophy, this should be applied to projections of *participating business*. Where management has discretion over allocation of bonuses, including the realisation of unrealised gains, projection assumptions should have regard to the past application of discretion, past external

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APPENDIX C (continued)

	Geddes working party	ABI achieved profits	EEV Principles
	(a) value the excess as if the office was closed to new business; and (b) value the shareholders interest only when new business was written or bonus distributions made. There should be full disclosure and year-on-year consistency of the treatment used.		communication, the influence of market practice regarding that discretion, and any payout smoothing strategy in place.
C.19 Disclosure	The reporting actuary should have maximum freedom in determining methods and bases, but there should be a high degree of disclosure of the methods and bases adopted.	The achieved profits guidance prescribes disclosure on: — assumptions; — methodology; — analysis of profit; — analysis of movement in achieved profit shareholders' funds; — sensitivities; and — segmentation. The guidance prescribes a format for reporting to shareholders, it is not a format intended for a reporting actuary to adopt for board reporting.	Embedded value results should be disclosed at consolidated group level, using a business classification consistent with the primary statements. Compliance with the *EVM Principles* is compulsory, and should be explicitly disclosed. Areas of non-compliance (with guidance) and reasons for non-compliance should be disclosed. Disclosure of sensitivities is intended to allow an informed analyst to make valid comparisons on different assumption sets. Sensitivity scenarios should include consistent changes in cash flows directly affected by the changed assumption(s). Guidance sets out a format for minimum disclosures of assumptions, methodology, analysis of return on EV, free surplus, sensitivities,

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APPENDIX C (continued)

	Geddes working party	ABI achieved profits	EEV Principles
			segmentation and directors statements. Additional disclosures to enable understanding of the reasons for movement in EV, and future sustainability of return on EV, are encouraged.
C.20 Analysis of change	The reporting actuary should provide an analysis of change in the embedded value to include at least the change due to: (a) changes in experience assumptions; (b) the valuation basis; (c) the discount rate; (d) new business; (e) interest on starting embedded value; (f) deviation of actual experience from experience assumptions; (g) transfers to profit and loss account; and (h) changes of a capital nature in asset values.	The report and accounts should include items such as: — new business contribution; — profits from existing business: — expected return; — experience variances; and — operating assumption changes; — development costs; — expected return on unencumbered capital; — life operating profit before tax and exceptional items; — exceptional items; — investment return variances; — effect of economic assumption changes; — life achieved profit before tax; — attributed tax; and — life achieved profit after tax.	Presentation of the breakdown (of change in EV over the period) is at the discretion of the company, however, the following items would be typical: — capital raised; — capital distributed; — new business contribution; — return on in-force business: — expected return; — experience variances; and — operating assumption changes; — development costs; — expected return on free surplus; — operating return before [after] tax and [before] exceptional items; — investment return variances; — effect of currency movements; — effect of economic assumption changes; — exceptional items; — return on EV before [after] tax; — attributed tax; and — return on EV after [before] tax.