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Sponsor Covenant Working Party Final Report

Allowing for the Sponsor Covenant in Actuarial Advice

November 2005

1. Introduction

This is the report of the Sponsor Covenant Working Party. It is addressed to the Technical Support and Research Committee of the Pensions Board. It sets out our findings based on our collective expertise and our research.

This report is concerned with actuarial advice in relation to defined benefit pension schemes. Accordingly, all references to schemes or actuarial pensions advice should be read as referring to defined benefit pension schemes. (Defined contribution pension schemes can also have deficits e.g. in relation to under provision for winding up expenses or because they contain guarantees that have not been secured. It should be self-evident how to apply the conclusions in this report in such cases.)

The layout of this report is as follows:

Section 2	summarises our recommendations.
Section 3	discusses the nature of the sponsor covenant.
Section 4	considers the issues arising from taking explicit account of the sponsor covenant in actuarial advice.
Section 5	summarises the principal current ways of assessing company credit quality that can be adapted to help trustees assess the sponsor covenant.
Section 6	sets out our thoughts and recommendations on how an assessment of the sponsor covenant can be incorporated into actuarial advice in practice.
Appendix A	sets out our terms of reference.
Appendix B	lists the members of the working party.
Appendix C	discusses deriving credit information from market prices.
Appendix D	summarises commonly-used credit models.
Appendix E	touches on how banks and other lenders assess credit risk.
Appendix F	explains credit ratings.
Appendix G	covers credit advisory services provided by accounting firms and other niche providers.
Appendix H	covers some services targeted specifically at trustees for assessing the sponsor covenant.
Appendix I	sets out two case studies demonstrating how trustees can achieve results for their members provided they act in time and take suitable advice.

If you wish to contact the working party, we suggest that in, the first instance, you contact Margaret Marchetti of the Actuarial Practice Division of the Actuarial Profession, at either:

- e-mail: Margaret.Marchetti@actuaries.org.uk, or
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Finally, we would like to register our thanks for the consistent support provided by Margaret Marchetti in co-ordinating and arranging our own meetings and those with third parties, and providing papers and minutes.

2. Summary of recommendations

2.1 Consolidation of actuarial advice and the sponsor covenant assessment (4.3)

We recommend that the Pensions Board supports the approach that actuaries should incorporate a third party assessment of the sponsor covenant into their advice by

- publicly encouraging actuaries to consider how to achieve it,
- providing examples of possible approaches, and
- sponsoring debate at Staple Inn on this topic.

At this stage, we do not recommend amending formal actuarial guidance.

2.2 Competence of actuaries to assess the sponsor covenant (5.1)

We recommend that the Pensions Board adopts and publicises to pensions actuaries the view that

- before advising on the assessment of a sponsor's covenant in relation to actuarial advice, actuaries should consider carefully whether they are competent to do so, and
- the actuarial training and typical actuary's experience is unlikely by itself to provide an actuary with this competence.

We recommend that this view should not be translated into formal guidance unless evidence indicates that the actuarial profession's reputation is seriously at risk from the advice given by actuaries.

2.3 Funding advice: exclude distress cases from actuarial analysis (6.2)

We recommend that

- actuarial funding advice should first distinguish between whether schemes are viable ongoing or in distress taking explicit account of the sponsor covenant,
- the dividing line between ongoing and distress should be a matter for trustees (or sponsors where appropriate) to determine rather than the actuary (although the actuary may consider that risks above a certain level mean that it is not credible to claim a scheme is viable ongoing),
- actuaries should present advice so that trustees or sponsors can make an informed decision as to whether their scheme is viable ongoing or in distress,
- for schemes in distress, the actuary should advise the trustees that scheme funding is more likely to focus on maximising members' benefits e.g. by maximising recovery for the scheme or by involving the Regulator rather than achieving the payment of benefits in full (which, by definition, is now unlikely), and
- actuaries should encourage trustees to disclose to their members a summary of the risk assessment the trustees used to determine whether the scheme is ongoing or in distress.

At this stage, we do not recommend that this is incorporated into formal actuarial guidance but that the Pensions Board promulgates this view as a possible approach and encourages debate on the subject.

2.4 Incorporating the sponsor covenant into funding advice (6.3)

We recommend that the Pensions Board promulgates within the profession the notion that, if actuaries wish to take account of the sponsor covenant,

- they need, *as a matter of course*, to be advising using a consistent overall risk framework that can (a) incorporate an external quantitative measurement of sponsor credit risk, (b) measure other risks (e.g. investment mismatch), and (c) attribute risks between causes, and
- conventional actuarial funding methods (e.g. projected unit) are unlikely to suffice in isolation.

We recommend that the Pensions Board considers using value at risk as an example to members of how this might be done in practice (while emphasising that this should not be to the exclusion of other risk assessment techniques such as scenario analysis).

2.5 Process for deriving funding strategy (6.4)

We recommend that the initial output on the process for assisting trustees and sponsors in deriving a funding strategy should be general guidance and examples rather than a formal Guidance Note.

2.6 Warnings accompanying actuarial advice depending on an assessment of the sponsor covenant (6.5)

We recommend that the Pensions Board reviews and then publishes to members a list of possible warnings that might accompany actuarial advice that takes account of the sponsor covenant.

3. The nature of the sponsor covenant

3.1 Analogy with credit risk

There are compelling parallels between corporate debt and the sponsor's obligation to stand behind its pension scheme's liabilities:

- The trustees may have the sole power to set sponsor contributions. Even if they do not, since April 1997 there has been a statutory minimum to the sponsor's contributions. When the new regime comes into force (expected to be October 2005 at time of writing), the process will be one of negotiation, with the Pensions Regulator acting as referee in the event of dispute. So, even though the terms for setting contributions are not 100% clear, it is clear that the sponsor has a legal obligation to provide some collateralisation[*] of the 'pensions promise'.
- Should the pension scheme wind up, the scheme deficit measured on a notional 'buy-out' basis becomes an unsecured debt on the sponsor (or sponsors). In other words, the underlying obligation is clear and set out in legislation.

Conventional credit quality assessment techniques are therefore a logical place to start in searching for existing techniques that can be adapted for assessing the strength of a sponsor's covenant.

3.2 What is the sponsor covenant?

Our working definition of the sponsor's covenant in relation to a scheme is

> 'the combination of (a) the ability and (b) the willingness of the sponsor to pay (or the ability of the trustees to require the sponsor to pay) sufficient advance contributions to ensure that the scheme's benefits can be paid as they fall due.'

A key difference between a sponsor covenant and typical corporate debt is that the sponsor's obligation to provide collateral (e.g. funding) for a pension scheme is usually not well-defined. This is why the definition refers to vague and difficult-to-measure concepts such as 'willingness' or 'ability'.

Given that it is intrinsically difficult to assess the risk of corporate credit default with certainty, it should come as no surprise that finding a simple answer for the assessment of the sponsor covenant and its consequent incorporation into actuarial advice may be even more difficult.

3.3 Complexity arising from corporate structure

Although we refer in this report to the sponsor simply as a single entity, the reality is more complicated.

Multi-employer schemes

First, complications may arise in any multi-employer scheme where there are pensions in respect of current or past employment with different employers because this affects how any debt is allocated

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[*] This paper often refers to the concept of 'collateral' or 'collateralisation'. This means providing assets or other forms of financial backing that will support a financial obligation if the entity with the obligation fails. This is a common method for helping parties to make arrangements to exchange future cashflows because it helps immunise them from changes in the financial status of the counter-party. Scheme funding is a form of collateralisation—the assets in the scheme help protect members in the event that the sponsor fails. We use the term 'collateral' because (a) it is more general—it covers all arrangements to improve security, which is the underlying issue, and (b) this is the term used by the rest of the corporate finance community—'funding' is actuarial jargon.

between the different current employers. We do not delve into this in depth other than to note the point.

Corporate groups

Less familiar to most actuaries will be the potential impact of the corporate structure of the sponsor. The ownership structure within a group of companies can be complex, often as a consequence of previous mergers or acquisition activity, or as a means of optimising the group tax position. In the event of corporate failure, the application of the relevant bankruptcy codes or insolvency law in determining competing creditor claims is usually in the hands of insolvency and corporate recovery practitioners or the courts. This complexity and uncertainty may not be readily apparent from a company's consolidated financial statements. Scheme trustees should be aware of the implications of corporate structure on the priority ranking of various creditor claims across a group and therefore on the scheme's credit risk exposure. The recovery that a scheme may achieve from the sponsor in the event of bankruptcy or insolvency may depend crucially on the position of the sponsoring company within the wider group.

In order to understand where a creditor ranks in a company's capital structure, credit risk analysts analyse a company's corporate structure to determine the level of 'subordination' of a claim. This is the relative ranking of a claim compared with other competing claims on a company's assets. The level of subordination in the corporate and capital structure of a company can have a significant effect on the likely recovery value of a creditor's claim in the event of insolvency or liquidation. Of particular interest is the identity of the legal entity that sponsors the scheme, the presence of any explicit guarantees from other group companies, the proximity of assets, and the sponsor's access to cash flows.

Credit analysts often identify two main ways in which subordination occurs:

- *Contractual subordination* reflects the terms of the legal contract between the debtor and creditor. For example, the creditor may have a 'senior' or 'junior' claim on the company's assets under the terms of a loan agreement. Alternatively, it may be secured by a legal charge over assets in the form of a lien or a fixed or floating mortgage, providing a creditor additional protection or comfort. Similarly, the creditor may have the benefit of a senior or subordinated guarantee from another group company, or even a third-party.
- *Structural subordination* refers specifically to the ownership structure within the group, the location of operating assets, and how cash flows through it. For instance, if a group borrows by issuing debt from a holding company but the only asset the holding company possesses is its equity investment in one or more operating companies then debt issued by the operating companies will rank ahead of holding company debt in any insolvency proceedings. The holding company debt is therefore structurally subordinated to the debt issued by the operating company. In practice, this situation may be ameliorated by the operating company extending a guarantee to the holding company. Another typical example is the issue of debt by finance company subsidiaries, the proceeds of which are lent as an inter-company loan to an operating company. Whilst the finance subsidiary may not own any operating assets, it may benefit from a senior guarantee from an operating company, the parent holding company, or both. Determining the likely relative position of competing claims across complex group structures to determine the level of subordination of a claim is therefore often difficult and uncertain.

When considering the strength of the sponsor's covenant and the recovery value of the outstanding pension obligation, trustees will need to consider

- where the scheme's claim sits within the group, how cash flows through the group, and the location of any realisable assets,
- how this may change over time e.g. if the company becomes more reliant on senior ranking or preferential sources of financing because it is financially distressed and lenders are unwilling to extend further finance without the additional security of a prior-ranking claim (which could cause a scheme's claim to decline rapidly as a company starts to suffer financial difficulties resulting in a final negotiating position that may be very weak indeed and the recovery value may well be zero), and
- the complicated corporate veil-piercing provisions of the Pensions Act 2004 that can be exercised by the Pensions Regulator (using a financial support direction).

It should be apparent from the above summary that trustees will in many cases need expert legal and/or credit advice

- to make any assessment of the sponsor covenant, and
- to help them put in place measures to counter the risks.

3.4 Issues for trustees

Under the new scheme-specific funding regime, we anticipate that trustees will need to take account of sponsor covenant strength, in particular in establishing their deficit repair plans. For many trustees, the challenge will be to achieve a balance between improving the funding position and precipitating a cash crisis for the sponsor.

Adequate section 75 cover

For schemes with adequate section 75 debt cover (i.e. the buy-out debt is covered by net sponsor assets available in the event of insolvency), trustees may take a longer term view on the deficit repair plan. They will still need to consider putting in place monitoring powers to ensure the position does not deteriorate and we expect it to become good practice that trustees put in place covenants (similar e.g. to banking covenants) at the time of the actuarial valuation.

Insufficient section 75 cover

For schemes with inadequate section 75 cover, the sponsor covenant risk is a very real issue. Where cash is available within the business, trustees can push hard to reduce under-funding as quickly as practicable. Where cash is not available, trustees will need to pursue the twin strategy of

- obtaining alternative immediate security (e.g. fixed charge over company-owned property), and
- identifying future corporate activity where cash is likely to become available (e.g. disposal of non-core business activities).

Commissioning or updating an assessment of the sponsor's covenant is likely to become a regular activity for trustees of schemes in this position as part of their responsibilities in relation to financial monitoring.

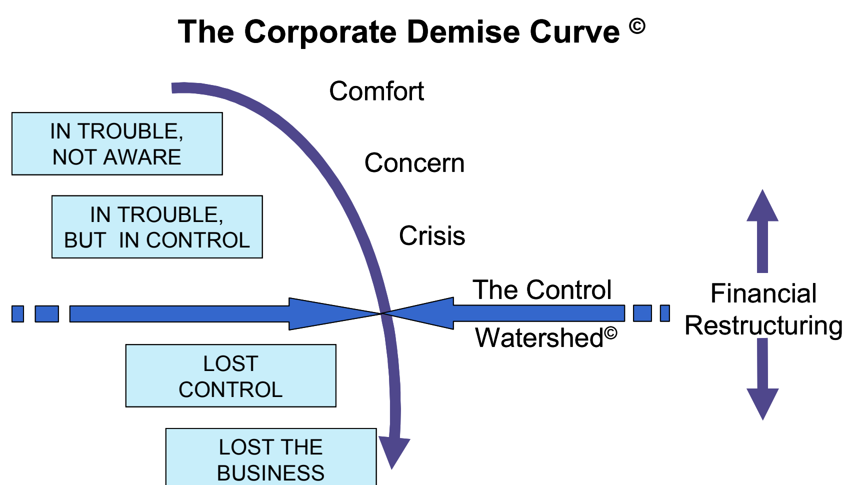
Trustees of such schemes need to ensure they are not too late arriving at the negotiating table. Trustees cannot rely on stronger Regulator notification to prevent other creditors (notably banks) from improving the security of their loans at the expense of the pension schemes when they spot that the scheme sponsor's financial position is deteriorating.

Trustees may find it helpful to mirror the behaviour of other lenders to the sponsor. For example,

- if the sponsor's bank is requiring security before advancing new money, the trustees should also consider whether to obtain some security for some of the pension deficit, and
- trustees could put in place the types of covenant that banks require when they lend to companies.

Typical pattern of corporate failure

The final phase of the corporate life cycle is corporate demise. This is illustrated below using a PwC-supplied graphic.



Because corporate demise follows a period of revenue and profit growth (i.e. the successful phase of the corporate life cycle) it takes time for management to face up to problems and take action.

The diagram illustrates three rapidly occurring sub-phases that comprise the corporate demise:

- Comfort,
- Concern, and
- Crisis.

The difficulties for the trustees include the following:

- It is difficult for any stakeholder to intervene during Comfort—management denial is just too strong.
- The move from Comfort, through Concern, to Crisis can be swift.
- Typically, key trustees are hopelessly conflicted in the business phase.
- Existing trusted advisers (e.g. actuary and pensions lawyer) lack expertise.
- The trustees will be competing for security with highly skilled and experienced operators (e.g. leading banks and vulture funds).
- These competitors are probably already engaged with management before the trustees even begin to consider their options.

This suggests that actuaries need to

- emphasise the need for trustees to monitor and take action in the event of corporate distress, and
- avoid giving advice beyond their training and experience in the event of corporate distress.

Monitoring

Trustees will need to monitor the sponsor. This may involve the following:

- Reviewing publicly available (e.g. in the sponsor's published accounts) financial metrics for the sponsor.
- Taking account of the sponsor risk implied by the PPF levy basis. If the scheme is in deficit then the strength of the sponsor covenant is likely to have an impact on the level of any risk-based levy introduced by the PPF. Trustees may in general consider requiring the levy to be paid by the sponsor as this incentivises the sponsor to reduce the deficit.
- Meeting regularly with the finance director or representative of the board to ensure that the trustees are kept informed of the sponsor's financial position and its plans for the future.
- Imposing covenants on the sponsor for notifying the trustees of circumstances which could materially reduce the security of members' benefits (e.g. coming close to breaching banking covenants, one-off additional dividend payments, share buybacks, re-structuring of corporate debt or new issuance of corporate debt at a level of security higher than that of the pension scheme).
- Trustees should ensure that they have an informed and regularly updated view of the strength of the sponsor covenant. This is likely to require expert non-actuarial opinion.

Actions trustees can take

In addition to monitoring, the trustees can take active steps to mitigate the risk:

- Change the scheme's investment strategy to bonds, which reduces the scope for the sponsor (or Regulator) to argue that technical provisions should be weak.
- Invest in assets that pay out (or are more likely to pay out) in the event of failure of the sponsor (e.g. credit default swaps).
- Negotiate for a share of any special payments by the sponsor to other stakeholders that would otherwise reduce the credit quality of the sponsor covenant with the pension scheme.
- Consider the possible alternatives to demanding significant lump-sum cash payments which the sponsor may not be able to afford. This might include collateralising the pension scheme deficit using the sponsor's fixed assets (if it has any), e.g. its property holdings or its receivables.
- Include ratchets in sponsor contributions so that if the sponsor's financial position improves then the scheme shares in this improvement.
- Put in place contingent contributions so that if the scheme's financial position deteriorates, the sponsor has to make up any deficit more quickly.

We have provided two case studies in appendix to illustrate how trustees can take action in distress situations.

4. Allowing for the sponsor covenant in actuarial advice

4.1 Relevance of the sponsor covenant to actuarial pensions advice

If either the reliance of the scheme on the sponsor covenant can be treated for all material purposes as absolutely certain or it is clear that the scheme will not need to rely on the future support of the sponsor, then actuarial advice need not take it into account. This applies for instance if

- a scheme is very well-funded, i.e. buy-out plus margins for risk (and the trustees have sufficient powers to prevent the sponsor from adding to the scheme's liabilities),
- the sponsor covenant is either so strong or so weak that dependence on it can be determined to be absolute or nil, or
- the sponsor's value has been realised (e.g. the statutory debt on the employer has been paid or compromised and the sponsor has no further liability).

Other than these exceptional cases, the sponsor covenant will be relevant to *all* actuarial pensions advice that depends materially on the assumption of future financial support for the scheme by the sponsor. In broad terms, this advice falls into two categories:

- *Funding*, i.e. how much the sponsor should pay, how scheme assets should be invested and how other financial arrangements should be used to collateralise the benefits.
- *Total valuation*, i.e. how valuable member benefits are taking account of *both* the scheme's assets *and* the scheme's potential call on the sponsor or the total cost to the sponsor taking account of how the sponsor's obligation may change under different future financial conditions. In making this assessment, assumptions about future funding will also be required.

There are, of course, other issues besides purely actuarial considerations that impact on these areas, such as legal interpretations of trust documents or whether some member options (e.g. terms for commuting pensions for cash sum at retirement) are more akin to benefits rather than values. These other issues do not, however, obviate the need for the actuarial part of the advice to consider the sponsor covenant.

Our view based principally on our collective personal knowledge, but also on our meeting with the Pensions Regulator, is that actuarial advice on funding and valuation

- has tended in the past to avoid the issue of the strength of the sponsor covenant, but
- is currently evolving under the pressure of changes to the legislation and regulatory regime, although it has not yet fully adapted to the new environment.

We note that the consultation earlier this year on EXD54 (the exposure draft of proposed changes to the formal guidance to actuaries on calculating cash equivalent transfer values) encountered considerable resistance within the profession to the proposed changes. One key change was taking explicit account of the sponsor covenant. However, we note that some, perhaps many, actuaries arguing against EXD54, had concerns other than the incorporation of the sponsor covenant (e.g. a different fundamental view on how value should be determined, disagreement over whether the PPF underpin should be incorporated in transfer values or simply that the methodology appeared complicated).

Our view is that not taking account of the sponsor covenant in actuarial advice is untenable as a long-term approach for the profession, because

- the sponsor covenant is self-evidently a factor for both valuation and funding, and it is therefore difficult to defend ignoring it,
- the PPF levy assessment of the sponsor covenant will be generally available (imperfect as it may be), i.e. a form of information that has previously been viewed as difficult to obtain or potentially unpalatable will be in front of every pension scheme trustee, and
- the Pensions Regulator takes the view that the sponsor's strength is a relevant factor for funding (as evidenced e.g. by its guidance on clearance and draft guidance on funding, which states that a 'buy-out' view on funding should apply if there is doubt as to whether the sponsor is ongoing).

4.2 Historical approach to funding advice

The foundation for much of current UK pensions practice was laid in a time when occupational pension schemes were lightly-regulated vehicles with minimal financial guarantees and, critically, no ultimate call on the sponsor. (Indeed, many schemes' trust deeds and rules make this latter point explicitly.)

The historical view tended to be that pension schemes would very likely meet the then minimal discontinuance benefits and therefore what mattered was how surpluses above this level were managed to provide benefits in the long term and how such surpluses might be shared between members and sponsors. Accordingly, actuarial advice has tended to focus on the following two scenarios:

- *Ongoing*. This is typically a 'prudent' best estimate view of the future designed to steer a course between 'too optimistic' and 'too pessimistic' views of the future.
- *Discontinuance*. This tests the position if the sponsor fails. Up until the early 1990s, pension schemes tended to be able to meet the minimum benefit on discontinuance without difficulty and therefore discontinuance was not seen as a concern and not rigorously enforced. When pension schemes started to have material discontinuance deficits in the late 1990s, it took considerable time (until 2005) for clear disclosure to be enforced in formal actuarial funding reports, with actuaries being free to apply other weaker tests in the meantime.

This is a bipolar view of the world: under the ongoing view, the sponsor is, in effect, assumed to be able to meet all future contribution demands within a very wide range; under the discontinuance view, the sponsor is assumed to fail immediately. Neither view is likely to be realistic for schemes unless they fall into the exceptional categories identified at the beginning of this section (i.e. the sponsor covenant can be regarded as virtually certain in relation to the financial obligation or the sponsor has already compromised its liability or failed).

Sensible givers and users of actuarial advice based on this bipolar view will try to temper it with an understanding that neither scenario is realistic (nor intended to be taken literally). However, the bipolar model does not provide any direct indication of how to interpolate between these two scenarios and, unless there is further information or advice, it does not help its users to make decisions where the sponsor covenant is a material factor. In the new UK pensions regime, it must be increasingly questionable why normal actuarial advice needs to be 'read between the lines' by its recipients. Besides the difficulty clients may have in interpreting actuarial advice, there is also a serious risk that this omission of a key variable will mean that actuaries themselves are unclear as to the advice they are giving. Ultimately this creates reputational risk for the Actuarial Profession, given that advice on the financial aspects of pension schemes is seen as our area of expertise.

The working party has considered whether and how an assessment of the sponsor's covenant could be incorporated into the standard bipolar model and concluded that there is no simple solution. It is *not possible* to incorporate what is inevitably a valuation-type or probabilistic assessment of the sponsor's covenant easily into the bi-polar world view—there is no existing placeholder in the methodology into which to slot the value or risk of the sponsor covenant.

We note that one can make arguments that some of the intermediate variables can be adjusted to take account of the sponsor covenant. A particular example is using an assessment of the sponsor covenant to determine the appropriate period over which to amortise a deficit. There are two problems with these types of argument. First, they do not point uniquely in one direction—should a weak employer make up a deficit more quickly to reduce the credit risk or should it be allowed to make it up slowly to increase its chance of survival? Second, this is building only half the bridge—what actually matters is the contributions paid and this depends equally, and therefore must be considered with, the strength of the funding target.

It is therefore our view that:

- additional development is required, and
- continued support of the bipolar model without suitable caveats represents a reputational risk for the actuarial profession.

Moreover, it is important to recognise that there may be material interdependence between funding advice and the assessment of the sponsor covenant: a funding approach implies a shape to the financial burden on the sponsor which may in turn impact on the assessment of the sponsor covenant (because e.g. much higher contributions may be sufficient to put the sponsor out of business). It follows that it would be useful if any assessment of the sponsor covenant is expressed in such a way that this impact can be understood.

4.3 Consolidation of actuarial advice and the sponsor covenant assessment

Consolidation of actuarial advice with an assessment of the sponsor covenant can take place in the following ways depending on the order in which the advice is given:

- *Direct incorporation*. The sponsor covenant assessment serves as an input used by the actuary in formulating his advice.
- *Third party consolidation*. The actuary constructs his advice so that a third party assessing the sponsor covenant can consolidate the actuarial advice with its view of the strength of the sponsor.
- *No consolidation*. The actuary and the assessor of the sponsor covenant both give their advice separately and it is left to the recipient to marry the two pieces of advice together. As with third party consolidation, the actuary could construct his advice so that the process of marrying the advice is made easier.

There is, in principle, no insurmountable problem in the actuary indicating how his advice would vary with different assessments of the sponsor covenant. In practice, it may be expensive for actuaries to provide advice covering a wide variety of scenarios (although it might assist actuaries with understanding the impact of risk if they had to consider in real situations how their advice should vary with the strength of the sponsor covenant).

We note in passing that there is a strategic aspect to this for the actuarial profession. Enabling a third party to consolidate the advice or actuaries failing to provide useable advice and so creating a role for a third party would create a risk that the actuarial profession would lose or diminish its position as

the pre-eminent financial adviser on pensions to sponsors and trustees (as reinforced by current and upcoming statutory requirements). Given that there are no overriding public interest reasons to support this approach, it is difficult to see why the profession would volunteer to reduce its influence in this way.

We recommend that the Pensions Board supports the approach that actuaries should incorporate a third party assessment of the sponsor covenant into their advice by

- ***publicly encouraging actuaries to consider how to achieve it,***
- ***providing examples of possible approaches, and***
- ***sponsoring debate at Staple Inn on this topic.***

At this stage, we do not recommend amending formal actuarial guidance.

5. Assessing the sponsor covenant

5.1 Competence of actuaries to assess the sponsor covenant

A good first question to ask is whether actuaries are themselves competent to assess a sponsor's covenant. Our strong view is that actuaries are not competent to make this assessment unless they have expertise in addition to that acquired as a result of their actuarial training and typical actuarial experience.

The basis for this view is as follows:

- Actuarial training and practice has not covered credit assessment and management techniques in depth.
- This field is already populated with recognised experts on assessing company and institutional credit quality, namely insolvency and turnaround practitioners (typically accountants), credit analysts and credit rating agencies.
- The issues in making any assessment are fraught with technical complications arising from complex corporate structures, potential management behaviours that impact on security, legal issues and a need to understand the context and limitations of the advice that can be given. The typical actuarial training and experience will not have equipped a pensions actuary to deal with these complications sufficiently well that he could withstand challenge from a recognised expert.
- The Pensions Regulator has strongly deprecated the notion that actuaries are, by virtue of their qualification, equipped to assess sponsor covenants (possibly at the prompting of recognised experts advising the Regulator).

We note that some actuaries have begun to quote financial metrics to trustees in an attempt to provide reassurance about funding plans. We suggest such data be used with care. In particular, we note the following potential dangers:

- Identifying the *relevant* metrics requires an understanding of a business and its industry sector.
- Day-to-day corporate activity (e.g. restructuring) can impact on the trustees' position.
- Data used may be either out of date or incomparable.
- The trustees' competitors for security and cash are likely to have better (e.g. more up to date or non-public) information.
- The transition by a sponsor from viable ongoing into corporate distress can be rapid.

We conclude that the actual assessment of the strength of the sponsor covenant ought in practice to be carried out by a third party unless the actuary is separately and demonstrably competent to carry out such an assessment. Introducing formal guidance to prevent this would, however, be inappropriate because

- this would hinder members' development of skills outside the traditional actuarial skill set, and
- it would be difficult to enforce because it would be difficult to determine which actuaries did not have sufficient skill.

We recommend that the Pensions Board adopts and publicises to pensions actuaries the view that:

- ***before advising on the assessment of a sponsor's covenant in relation to actuarial advice, actuaries should consider carefully whether they are competent to do so, and***
- ***the actuarial training and typical actuary's experience is unlikely by itself to provide an actuary with this competence.***

We recommend that this view should not be translated into formal guidance unless evidence indicates that the actuarial profession's reputation is seriously at risk from the advice given by actuaries.

5.2 Existing credit assessment techniques and their providers

The following are potential sources of information on the absolute level of or changes to a sponsor's credit quality:

Method	Description	Key features
Business outlook	Assessment of the business outlook in general and specific to the sponsor's sector.	▪ Cheap ▪ Subjective ▪ Difficult to quantify
Financial metrics	Comparison of financial metrics such as interest cover and leverage ratios with (a) comparator companies to make a relative assessment and (b) previous values to spot deterioration.	▪ Cheap ▪ No absolute indication of risk ▪ Requires access to management accounts if to be more responsive than the frequency of published accounts
Implied market default risk	The (relative) market price of any sponsor credit risks that are actively traded (e.g. corporate debt or credit default swaps). See appendix C.	▪ Low level of coverage ▪ Cheap if available ▪ Market prices are affected by factors other than the amount of risk (e.g. the market appetite for credit and other risks) and therefore relative pricing spreads need to be used ▪ Fast reacting ▪ Can provide a quantifiable output (i.e. a probability of default)
Credit rating	Credit ratings provided by the specialist credit ratings agencies. Companies may pay a ratings agency to provide a credit rating for them or for a planned debt issue. The company may provide the ratings agency with access to information that is not publicly available. See appendix F.	▪ The de facto currency for credit quality risk ▪ Only large companies tend to have full credit ratings (although coverage is wider than implied market default risk)
Merton-type credit risk models	A model default probability based on the behaviour of the sponsor's traded equity similar to the Merton model.	▪ Requires the sponsor to have traded equity ▪ Question mark over availability—these ratings are provided to large scale lenders and are priced accordingly ▪ Can provide a quantifiable output (i.e. a probability of default)

Method	Description	Key features
Quantitatively derived credit risk	This is a model deriving a credit rating or probability of default from standard corporate accounting data, possibly augmented by confidential credit information from credit bureaux and commercial banks. Such services can vary substantially in their emphasis, time horizons, factors taken into account and intended application). See appendix F.	▪ Wide coverage ▪ Relatively cheap ▪ These rely principally on accounting information, which is typically updated annually in arrears (after Companies House accounts have been filed—note that companies in distress may file late). They are supplemented by feeds taken from other sources (e.g. relating to payment of bills etc.). ▪ Can provide a quantifiable output (i.e. a probability of default) ▪ We note that it is the intention of the Board of the Pension Protection Fund (PPF) to use this type of technique to assess the corporate default risk in determining pension schemes' PPF levies (in terms of a one-year probability of default). In other words, all schemes will have at least one measure of this sort readily available.
Independent business review (IBR)	A report by an external credit advisory specialist, typically an accountancy firm, insolvency practitioner or other niche operator. The standard product is the Independent Business Review (IBR). Lenders incorporate covenants into their lending terms and conditions with the intention of providing themselves with the power to commission such a report (although it is typically paid for by the company) if changes to business or financial conditions are impacting materially upon the security of their loan. See appendix G.	▪ More expensive (although arguably relatively cheap if considered in proportion to the deficit and compared with investment management expenses paid in relation to scheme assets) ▪ Requires sponsor cooperation (for access to management accounts and other confidential accounting information) ▪ Probably more appropriate for when there is a question mark over a sponsor rather than as a general monitoring tool ▪ Can take explicit account of the interdependence of funding and the sponsor covenant ▪ Can help trustees with the key question, 'how much can the sponsor afford?' ▪ Deemed by the Pensions Regulator to be something that trustees ought to commission when the sponsor is involved in a corporate transaction

5.3 Specialist sponsor covenant assessment services

A number of providers have or are extending their credit rating or advisory services to target the assessment of the sponsor's covenant.

- A number of accounting firms are offering to provide reports similar to IBRs to trustees but with special focus on aspects relevant to pension scheme funding. (One firm is offering a screening service based on accounting information to act as the trigger for trustees to consider commissioning a more detailed review.) Given that the Regulator has suggested that, where trustees are concerned over the sponsor's strength, they should obtain an IBR, we expect the IBR approach to develop further (especially as it has been used principally only in distress and Regulator clearance situations so far).
- One credit ratings agency is using its credit rating experience to produce sponsor-specific credit quality reports in a standardised format designed to assist trustees in monitoring the sponsor's credit quality. Importantly, from the point of view of actuarial advice, it also provides

a quantitative assessment of the sponsor covenant that can be used as an input for actuarial calculations.

These services are described in more detail in appendix H.

It seems likely that this area of advice and services will develop substantially over the next few years.

5.4 Trustee information gathering and monitoring

For completeness, we note that trustees have not always had sufficient information to monitor the sponsor's covenant. The Regulator has indicated that trustees should remedy this situation. In general, trustees will need to have sufficiently strong negative pledges from the sponsor to ensure they have relevant information on a timely basis.

We anticipate that, over time, this will become best practice, but, for the time being, this represents a significant culture change for sponsors and trustees.

6. Incorporating the sponsor covenant into actuarial advice

6.1 Valuation of members' benefits

In principle, allowing for the sponsor covenant when valuing members' benefits is a matter of adjusting the discount rate to allow for the risks relating to scheme under-funding, future planned contributions and how these may change, including the possibility that the sponsor falls into distress or fails. (In case there is any doubt, we are referring here to the total value of the members' benefits taking into account all risks rather than e.g. setting a funding target.)

The Pensions Board, in effect, began the process of addressing the issue of incorporating the sponsor covenant into the valuation of member benefits when it issued EXD54 proposing revised formal guidance on the calculation of members' cash equivalent transfer values. As noted already, the response from the membership was not positive, although this may not have arisen solely from the proposal to take explicit account of the sponsor covenant.

Despite this resistance, our view is that ignoring the sponsor covenant in this context will become increasingly untenable as a philosophical approach (although in practice there may be short cuts that allow actuaries to avoid addressing it directly, such as the ability to reduce cash equivalents for under-funded schemes).

Given that the Pensions Board has already considered the incorporation of the sponsor covenant into benefit valuation, we do not address this further other than to note that the key inputs required are

- a rate of probability of default (which may be time dependent), and
- possibly, a corporate debt recovery rate.

6.2 Funding advice—excluding distress cases from actuarial analysis

We suggest that the first step to incorporating the sponsor covenant into funding advice should be to divide sponsors broadly into the following two categories:

- *Ongoing*. These sponsors would be characterised by a (buy-out) deficit that is financially manageable in some sense (i.e. there is a reasonable likelihood of it being paid off over a period for which the sponsor is good for the risk).
- *Distress*. These sponsors would be characterised by a (buy-out) deficit that is financially unmanageable given the resources of the sponsor (i.e. there is no realistic likelihood of paying down the deficit within a timescale for which it would be credible to lend to the sponsor unsecured).

The key point is that actuaries need to recognise that the distress situation is fundamentally *not* about conventional ongoing actuarial advice; rather it is a matter of the trustees, and possibly the Regulator, extracting maximum value for the scheme from a poor position. For this purpose, pure actuarial advice is likely to be superfluous. This is directly analogous to corporate recovery or turnaround and we propose making the distinction for the same reason that it is made more generally in corporate finance, i.e. the rules change once a business crosses the boundary between being viable ongoing to being in distress.

The advantages of recognising the distress situation and treating it differently are as follows:

- By distinguishing ongoing from distress situations, financial logic can be applied reasonably consistently within each category of situation. The classic example of otherwise contradictory advice is how strength of scheme funding should depend on the strength of the sponsor. All else being equal, one can argue that a strong sponsor can fund its scheme more weakly because the sponsor is good for the deficit. However, one can also argue that a weak sponsor should be permitted to fund its scheme more weakly because requiring earlier payment would put the company out of business. Our proposed approach would recognise that the weak sponsor may well be permitted weaker funding but that this is because the scheme needs to maximise its value from a sponsor that is financially inadequate for supporting the pension scheme.
- Actuaries would not be drawn into justifying weak funding bases for the sole purpose of propping up a failing sponsor (which is a reputational risk for the actuarial profession).
- Once a situation is recognised as distress, a constructive approach can be taken to salvaging something from the situation rather than chasing it further into financial difficulty.

The disadvantage is that a line needs to be drawn when the reality is that there is no fixed line but a gradual transition. In corporate debt situations, both the power to draw the line and the incentives to do this lie with the creditors. For many pension schemes in distress, the trustees will have an incentive not to call time because this way their members will continue to have benefits in payment paid in full in the short term, actives will, in effect, continue to accrue benefits in the PPF, pensioners may receive higher pension increases than they would in PPF and more of their members will cross the normal retirement age threshold and therefore receive better PFF protection. However, we consider that simply requiring trustees to consider where their scheme stands is likely to help with their understanding of (a) the risks associated with pension scheme funding and (b) the type of advice they can reasonably expect to receive from their actuary.

We think that the best approach is for the actuary to present the position in such a way that the trustees can make an informed decision rather than the actuary attempting to draw the line himself. Disclosure to members should also be encouraged—members will be better placed to assess the value to them of their benefits if they know, say, that there is a one in twenty chance that their benefits will be reduced to 80% in five years' time.

We have used the term 'distress' by analogy with corporate finance because its meaning in this context is fairly well understood. However, we note that the adoption of a less potentially emotive term may encounter less resistance from trustees, sponsors and the actuarial profession.

We recommend that

- ***actuarial funding advice should first distinguish between whether schemes are viable ongoing or in distress taking explicit account of the sponsor covenant,***
- ***the dividing line between ongoing and distress should be a matter for trustees (or sponsors where appropriate) to determine rather than the actuary (although the actuary may consider that risks above a certain level mean that it is not credible to claim a scheme is viable ongoing),***
- ***actuaries should present advice so that trustees or sponsors can make an informed decision as to whether their scheme is viable ongoing or in distress,***
- ***for schemes in distress, the actuary should advise that the trustees are concerned with maximising recovery and that this will drive scheme funding rather than achieving payment of benefits in full, and***

- ***actuaries should encourage trustees to disclose to their members a summary of the risk assessment the trustees use to determine whether the scheme is ongoing or in distress.***

At this stage, we do not recommend that this is incorporated into formal actuarial guidance but that the Pensions Board promulgates this view as a possible approach and encourages debate on the subject.

In the remainder of this section, we focus on how actuarial advice might incorporate an assessment of the sponsor covenant in the ongoing situation.

6.3 Incorporating the sponsor covenant into funding advice

Incorporating the sponsor covenant into funding advice is not straightforward because, as was noted in section 4.2, standard actuarial approaches tend to imply no sponsor risk (ongoing actuarial view) or that the sponsor fails immediately (discontinuance). We therefore need to extend what we do by incorporating risk measurement.

In a sense, now is an opportune time for making this transition because trustees will be legally obliged under the new funding regime to consider whether their technical provisions are 'prudent' and risk measurement is the obvious way to achieve this. It is a logical extension that trustees should understand the level of prudence implied by their overall funding strategy as expressed in their scheme's statements of funding and investment principles.

Given the wide possible interpretation of the word 'prudent', the Actuarial Profession may also wish to discourage actuaries from describing as 'prudent' funding bases that in practice are, for instance, likely to lead to a pension scheme having insufficient resources to meet its benefits in full if the sponsor were to fail within the next say ten years, and instead encourage actuaries to use quantitative measures that are less ambiguous.

A suitable risk framework would measure the risk of benefits being paid at less than x% in n years' time and be able to attribute the risk between different causes, including:

- *The existing deficit*. Current under-funding implies a significant immediate risk.
- *Sponsor covenant*. Risk relating to reliance on the sponsor to meet the buy-out deficit at the end of the next n years. In theory, this could be divided between defaulting on current contributions and lack of sufficient debt recovery in the event of corporate failure.
- *Investment mismatch*. Risk relating to investment mismatch compared with the liabilities. In practice, this might be divided between economic and demographic (principally longevity) risks.

Required input for incorporating the sponsor covenant into actuarial advice

In order for actuaries to give quantitative advice, they will need a quantitative measure of the strength of the sponsor. Credit rating agencies can use historical cumulative default data and a credit rating to estimate a default probability.

Possible approach

We note that a 'value at risk' approach meets the requirements for a suitable risk framework outlined above and will already be familiar to

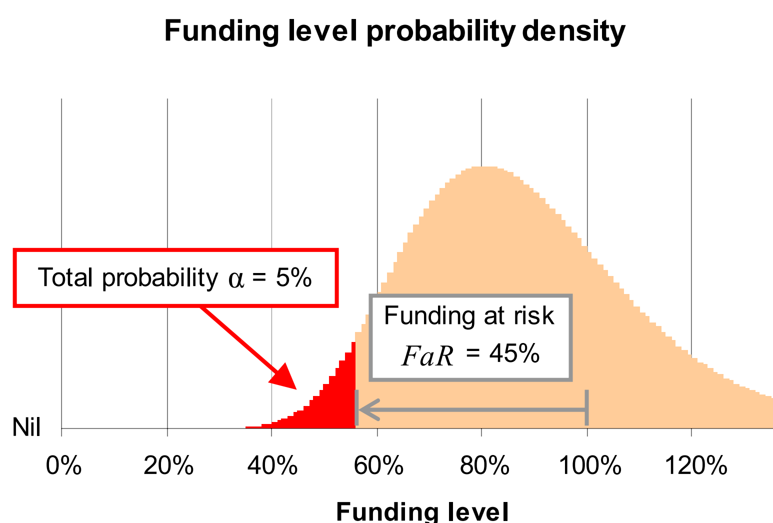
- many actuaries (in the form of the percentiles for deficits or funding levels from asset-liability modelling), and

- many individuals in corporate financial management (because value at risk is a standard approach to measurement of corporate financial risk).

The value at risk could be defined in relation to a buy-out deficit (DaR) or funding level (FaR) for a given confidence level α (e.g. 5%) over time τ as follows:

$$\mathbf{P}(Deficit_\tau \geq DaR) = \alpha$$
$$\mathbf{P}(FundingLevel_\tau \leq 100\% - FaR) = \alpha$$

The deficit at risk is illustrated in the following graph:



It is important that the timescale τ is credible (say 5 years or less)—risk measured over a longer period is unlikely to be meaningful in a corporate context.

While in theory one should take account of priority order, as a first approximation the overall funding level will still provide meaningful risk information given that the statutory priority order has been made less extreme over recent years.

Development of risk measurement approaches is a matter for actuaries and the profession and outside our scope. Accordingly, we do not pursue the risk measurement methodology further here other than to note that

- given figures for probability of default (and possibly some recovery level), an approximate assessment of this type of measure is within the grasp of every actuary with a copy of e.g. Excel on his PC (because it can be carried out deterministically in standard cases), and
- many of the methods of sponsor covenant assessment considered above will generate probabilities of default over given time horizons.

We point out that providing these quantitative risk measures does not mean that other risk assessment techniques should not also be used. For instance, scenario ('what if?') analysis is often used in tandem with probabilistic methods because individuals tend to find it helpful to consider a concrete scenario rather than a quantile of a probability distribution.

We recommend that the Pensions Board promulgates with the profession the notion that, if actuaries wish to take account of the sponsor covenant,

- ***they need, as a matter of course, to be advising using a consistent overall risk framework that can (a) incorporate an external quantitative measurement of sponsor credit risk, (b) measure other risks (e.g. investment mismatch), and (c) attribute risks between causes, and***
- ***conventional actuarial funding methods (e.g. projected unit) are unlikely to suffice in isolation.***

We recommend that the Pensions Board considers using value at risk as an example to members of how this might be done in practice (while emphasising that this should not be to the exclusion of other risk assessment techniques such as scenario analysis).

6.4 Process for deriving funding strategy

There is a culture within the actuarial profession whereby the actuary

- perceives that he determines scheme funding on the basis of his professional judgement, and
- considers this judgement to be a key part of why he is retained by trustees and sponsors.

Without wishing to debate this view, we note that presenting advice within a risk management framework may be considered by some actuaries as threatening the role they assume their professional judgement plays. To counter this, we point out the following:

- The notion of prudence is not well-defined and varies extremely widely between individuals. Given this very wide range, it is questionable whether it is appropriate for an actuary to use his own view as *the* measure of prudence. Instead, we think that the actuary should present sufficient information so that trustees can determine their view.
- Regulations (currently in draft) under the Pensions Act 2004 give the job of setting technical provisions, including whether they are sufficiently prudent, explicitly to trustees. The legal requirement is for trustees to take actuarial advice, not for the actuary to determine what is or is not prudent.

While the draft regulations refer explicitly to prudence only in relation to setting technical provisions, trustees will inevitably need to consider the risk of their overall funding strategy (i.e. including how deficits are amortised, how contributions should change in the event of contingencies and how the scheme assets are invested). It would be appropriate for trustees to consider these matters in detail before agreeing a funding approach with the sponsor under the new funding regime for the first time and documenting it in their scheme's statement of funding principles (especially given that the draft regulations state that changes to the technical provisions basis must be 'justified by a change of legal, demographic or economic circumstances').

In view of the above, we suggest that instead of continuing with the traditional approach of making a recommendation or statement of adequacy of contributions under one set of future assumptions, a better approach is for actuaries to illustrate how different technical provisions, recovery periods and investment strategies imply different levels of risk and leave it to the trustees to select the overall strategy that best meets their objectives.

We are of the view that the Pensions Board should act to foster debate and some minimum quality of advice by actuaries. However, practice is only just developing in this area and imposing formal guidance to require actuaries to depart from their current practice would be difficult and potentially constrain development.

Accordingly, we recommend that the initial output on the process for assisting trustees and sponsors in deriving a funding strategy should be general guidance and examples rather than a formal Guidance Note.

It is likely that account will need to be taken of some of these factors in due course in GN9 but this may be beyond the period for which responsibility for setting standards remains with the Actuarial Profession.

6.5 Warnings accompanying actuarial advice depending on an assessment of the sponsor covenant

In incorporating inputs on the strength of the sponsor covenant, actuaries will need to be aware that the warnings that they have developed over the years to accompany their normal funding advice may prove inadequate.

In addition to our proposal that it should generally be the trustees who should determine prudence rather than the actuary, we suggest that actuaries consider including references to the following risks and caveats in their advice:

- Any assessment of the credit quality of a scheme sponsor is inevitably inexact and therefore will itself be subject to uncertainty.
- If information regarding the sponsor covenant has been relied upon in giving advice or carrying out calculations, the actuary should state the source and context of this information.
- Reliance on a sponsor is a concentrated risk—even if the sponsor is relatively safe, the consequences of the sponsor failing can be severe for an under-funded pension scheme.
- Models for statistical risk tend to be indicative because they are limited by the amount of historical statistical data.
- Unforeseen contingencies are (by their nature) not modelled and therefore models tend to understate risks, especially large risks.
- A company's financial strength can deteriorate rapidly e.g. as a result of the loss of a key contract, movement of key employees or exposure to commodity prices. Trustees should not assume that they will have time to act or that they will be able to obtain more security from the sponsor when they become aware of a deterioration on the sponsor covenant. In the event that the sponsor covenant shows signs of weakening or that the sponsor may be entering distress, the trustees may need to act quickly and take suitable (non-actuarial) expert advice in order to protect the interests of the scheme's members. The advice required is likely to include legal advice and corporate financial advice (e.g. from an accountancy firm).
- Some risks may be correlated. For instance, a fall in the stock market may be correlated with a deterioration in trading conditions, which could mean that the sponsor covenant deteriorates at the same time as the funding position of the scheme becomes worse.
- Measuring risks is a first step—trustees need to consider whether they wish to and how they can mitigate some or all of those risks.

We recommend that the Pensions Board reviews and then publishes to members a list of possible warnings that might accompany actuarial advice that takes account of the sponsor covenant.

Appendices

A. Terms of reference

1. To recommend how the sponsor covenant can be characterised and assessed for the purposes of actuarial guidance or standards relating directly or indirectly to company-funded pension schemes, including funding, benefit security and cash equivalent transfer values. For the purpose of this working party, the sponsor covenant is the ability and willingness of (or ability of the trustees to require) the sponsor to ensure that accrued pension benefits are paid.

2. To make recommendations on the advice, particularly cautionary advice, that should accompany any reliance on an assessment of the sponsor covenant, including in particular the correlation of the sponsor covenant with other events that can have a negative impact on pension scheme benefit security and the need for consistency between funding and other actuarial involvement (such as cash equivalent transfer values).

3. To investigate and report on

   (a) current techniques used in credit rating, credit scoring and credit investment analysis,

   (b) credit information derivable from capital market information such as spreads corporate bonds and credit default swap pricing,

   (c) techniques currently used by the banks and other lenders to measure and monitor company strength, and

   (d) methodologies currently being adopted by financial advisers to trustees in measuring sponsor strength.

4. To set the above recommendations and investigations in a context where the Regulator and the Board of the Pension Protection Fund are themselves expected to take account of the sponsor covenant in their roles.

5. To deliver a preliminary written report to the Technical Support and Research Committee of the Pensions Board by [15 July 2005] and a final written report by [31 August 2005].

B. Members of the working party

The members of the working party are as follows:

- Tim Gordon (chairman), Hewitt
- Andy Evans, Insight Investment
- Guy Freeman, Goldman Sachs
- Nick Forrester, Hymans Robertson
- Richard Hall, Standard & Poor's
- Neville McKay, PwC
- Peter Shellswell, First Actuarial plc

Support was provided by Margaret Marchetti, Actuarial Practice Division of the Faculty and Institute of Actuaries.

C. Credit information derivable from market prices

Some pension schemes are sponsored by companies for which the equity and/or debt is regularly traded. Other pension schemes are sponsored by companies that are part of a wider group that have traded equity or debt. The market prices for investments in these companies provides an indicator of the markets' view of the associated credit risks and how these views change over time.

The market information that is most relevant will be prices for equity shares, bonds and credit default swaps (CDSs). Loans are sometimes traded but this is less common.

The proportion of pension schemes weighted by number that have access to such relevant market information on their sponsors is limited (given that there are approximately 10,000 schemes in the UK and a far lower number of quoted entities). The proportion is naturally much higher when weighted by pension assets.

Where market prices are available, a measure of credit risk can be derived from market prices. A pension scheme's risk will however differ in a number of ways from the market implied credit risk due to

- differences in the reference entities,
- the inherent differences between borrowed money and a pension deficit, and
- differences in the priority or security provided.

Putting aside these differences it is still informative to consider the markets' assessment of risk on these instruments. For sterling bonds the credit spread is typically viewed as the spread in yields over comparable gilt yields. However, some market participants view credit spreads as being the spread over swap yields (30bps over gilts at time of writing) and this is more consistent with the CDS markets.

A CDS contract is an over-the-counter derivative contract between two parties that transfers credit risk on a third entity. The two parties to the CDS contract are known as the protection seller and the protection buyer. The protection buyer pays an annual premium to the seller in return for compensation against losses in the event of a default by the reference entity. The compensation on a default is equal to the shortfall below par in the prices of the entity's debt shortly after default.

This extra yield from bonds or the spreads on CDS instruments are typically viewed as compensating the investor for two risks:

- the cost of credit risk and
- the risk of illiquidity.

Whilst illiquidity risk is hard to analyse and sensitive to whether markets are stressed or not, a considerable amount of analysis is undertaken on the cost of credit. This is usually done in one of two ways:

- by combining probability of default with expected losses on default, and
- by deriving the cost of credit risk implied by equity prices.

In the first approach, rating transition matrices are used to map out the probability of being in different ratings categories in each year of the future. This is done using probabilities of moving from the current rating category to a different category over one-year horizons. These probabilities are usually derived from historical behaviours of credit ratings derived by ratings agencies. Applying a

transition matrix provides an estimate of the overall probability of default within a set time horizon. This probability of default on a debt's cash flows can then be combined with an assumption about recovery of the debt on default to provide an expected loss from credit risk.

Typically little time is spent by market analysts in analysing the expected recovery rates for each entity for the simple reason that recovery rates are very hard to derive from publicly available information. The values of assets recorded in company accounts may not be relevant in the event of a liquidation. In addition the analysis would need to be carried out on a bottom up basis (i.e. liquidating the companies at the bottom of the corporate structure first). For a complex corporate structure this would be an extensive task. As a result, assumptions for recovery rates are usually based on historical averages for payouts on past defaults. In addition, it is not yet clear how the market has priced in the step change in pension debts for insolvent companies that occurred in February 2005.

This process could be operated in reverse. Given an assumption for recovery rates an estimate can be derived for the markets implied default probability. This estimate is likely to overstate the true probability unless adjustments are made for the component of the credit spread that is due to illiquidity risks.

Information about the cost of credit risk can also be derived from equity prices. This is useful not only when the debt instruments are not traded or the prices are simply unreliable due to illiquidity but also as a comparison with estimates derived directly from credit instruments.

This approach uses the non-linear nature of equity and debt investments into a firm's assets to derive a cost of default. A common model is the Merton model, which treats the value of a traded equity as the excess value of its business less its debt. This is similar to pricing an option and so a model like Black-Scholes can be applied. This implies that the credit quality of the debt depends on the relative amounts of equity and debt, and the volatility of the underlying business. Moody's KMV uses a modified version of this model to derive default probabilities.

D. Summary of commonly-used credit models

D.1 Introduction

There has been a vast amount of research devoted to credit risk and it is not the purpose of this appendix to attempt to cover it all in detail. Instead, we provide a brief introduction to the types of models that are commonly used along with some of their more significant properties. For the interested reader we provide sources for further reading.

Models of risky debt value depend on the time value of money (as characterised e.g. by the yield curve for risk-free returns) and the probability that the issuer will default on its obligation. Neither of these factors is easy to model in isolation; together they make for complex modelling.

The second factor, the probability of default, tends to be the focus of most models of risky debt value. There are two approaches:

- *Structural models*. These models are concerned with modelling and pricing credit risk specific to a particular firm and assume that credit events are triggered by movements in the firm's value relative to some threshold, typically based on the level of debt in the firm's capital structure.
- *Reduced-form models*. Instead of modelling a firm's assets or its capital structure, reduced-form models specify credit events in terms of an external process, enabling the modelling of default without much information about why the firm defaults.

In broad terms, structural models use economic reasoning to guide their implementation, whereas reduced-form models take the economics out of the risky debt valuation problem.

Under both approaches there is a third factor that affects the corporate debt value. This is the expected-loss given default, often referred to as the recovery rate.

Which model is preferred generally depends on the purpose for which the model is being used. If one is using the model for risk management purposes—pricing and hedging—then the literature suggests that the reduced-form approach is the correct one to take. If a company's management (or their advisers) are judging the firm's default risk for capital considerations then a structural model may be preferred.

The remainder of this appendix provides some further information about these approaches. If you wish to find out about credit risk modelling in more detail, useful books which cover both structural and reduced-form models are 'Credit Derivatives Pricing Models: Model, Pricing and Implementation' by Philip J. Schonbucher, 'Credit Risk Modeling: Theory and Applications' by David Lando and 'Credit Risk: Modeling, Valuation and Hedging' by Tomasz R. Bielecki and Marek Rutkowski.

D.2 Structural models

Structural models are concerned with modelling and pricing credit risk specific to a particular firm. They assume that credit events are triggered by movements in the firm's value relative to some threshold. A major issue in this approach is the modelling of the evolution of the firm's value and of the firm's capital structure. For this reason, the structural approach is often referred to as the 'firm value approach', linking credit events to the firm's economic fundamentals.

Most structural models are concerned with only one type of credit event, the firm's default. The time of default is typically specified as the first moment when the value of the firm reaches a certain lower threshold. Such a default triggering mechanism has a natural interpretation as the safety covenant, which aims to protect the interests of the bondholders against those of the stockholders.

The classic structural model is the Merton model, introduced in 1974, which provides a closed-form solution for the value of debt and equity of a firm. The economic insight of this approach relates to the relationship between a firm's asset value and its obligations. In particular it is the idea that equity can be considered a call option on the market value of the firm's total assets with a strike price equal to the book value of the firm's debt.

Extensions to this model include:

- the introduction of a barrier on the asset value which triggers default (Black & Cox),
- the inclusion of a stochastic risk-free interest rate process (Longstaff & Schwartz), and
- incorporating taxes and bankruptcy costs (Leland & Toft).

Criticisms of the traditional structural approach include the fact that, in the context of the earlier models, default could never occur by surprise without the introduction of more sophisticated stochastic processes. Therefore, as the time to maturity of the debt goes to zero, credit spreads predicted by these models also approach zero. In practice we observe non-zero credit spreads for nearly all corporate debt regardless of maturity. Various improvements have been suggested to overcome this issue, although they are beyond the scope of this appendix.

For reference, the following list represents a small selection of the more well-known papers on structural models:

Merton, C. R. (1974). 'On the pricing of Corporate Debt: The Risk Structure of Interest Rates.' *Journal of Finance* 29, 449-470.

Black, F. and Cox, J. C. (1976) 'Valuing Corporate Securities: Some Effects of Bond Indenture Provisions.' *Journal of Finance* 31 (2), 351-367

Longstaff, F. A. and Schwartz, E. S. (1995) 'A Simple Approach to Valuing Risky Fixed and Floating Rate Debt.' *Journal of Finance* 50, 789-820

Leland, H. E. and Toft, K. B. (1996) 'Optimal Capital Structure, Endogenous Bankruptcy, and the Term Structure of Credit Spreads.' *Journal of Finance* 51 (3), 987-1019

Ericsson, J. and Reneby, J. (1998) 'A Framework for Valuing Corporate Securities.' *Appl. Math. Finance* 5, 143-163

D.3 Reduced-form models

As discussed earlier, under the reduced-form modelling approach the value of the firm's assets and its capital structure are not modelled at all. Reduced-form models rest on the assumption that default is an unpredictable event governed by some random process.

We can distinguish between the reduced-form models that are only concerned with the modelling of the default time and those that also consider the migrations between credit rating classes. The former models are referred to as intensity-based models whilst the latter are known as credit migration models.

Under the intensity-based approach, the time of default is modelled as a random variable which is not predictable, i.e. the default event arrives as a surprise. The distribution of this time must be parameterised by an intensity or hazard rate process.

Intensity-based models were first introduced by Jarrow & Turnbull and involved simple assumptions regarding the default-time process and the recovery rate. Most extensions to intensity-based models focus on more sophisticated characterisations of the hazard rate process. As with the structural approach, it is possible to introduce a stochastic model for the risk-free interest rate.

Further extensions to the intensity-based models make use of some aspects of the structural approach, for example linking the hazard rate process to the value of the firm's assets. These are referred to as hybrid models.

The credit migration approach involves modelling default as the first time a Markov chain with multiple states hits the absorbing default state. The states in this model can be thought of as credit ratings and the Markov chain governs the transition from the initial credit rating until default occurs. In these models default still happens without predictability, i.e. is a true surprise, although as we follow the progression through the ratings we may 'expect' it to occur with a higher probability in states which are closer to default.

Although these models (first introduced by Jarrow, Lando & Turnbull) provide an increased flexibility in specifying the evolution of default intensity this comes at the cost of additional estimation difficulty. The use of a Markov chain process increases the number of parameters which are required to be estimated in order to arrive at the transition probabilities for each possible change in state.

The use of historical transition matrices, which are available from companies like Standard & Poor's, enable the models to be calibrated but the empirical validity of this approach in valuing corporate debt has yet to be demonstrated.

The major appeal of a reduced-form model is its mathematical tractability rather than economic insight.

For reference, the following list represents a small selection of the more well-known papers on reduced-form models, both intensity-based and involving credit migrations:

Jarrow, R. A. and Turnbull, S. M. (1995) 'Pricing Derivatives on Financial Securities Subject to Credit Risk.' *Journal of Finance* 50 (1), 53-85

Madan, D. and Unal, H. (1998) 'Pricing the Risks of Default.' *Review of Derivatives Research* 2, 121-160

Das, S. R. and Tufano, P. (1996) 'Pricing Credit-Sensitive Debt when Interest Rates, Credit Ratings, and Credit Spreads are Stochastic.' *J. of Financ. Engrg* 5 (2), 161-198

Schonbucher, P. J. (2000) 'Credit Risk Modelling and Credit Derivatives.' Ph.D. dissertation, University of Bonn

Jarrow, R. A., Lando, D. and Turnbull, S. M. (1997) 'A Markov Model for the Term Structure of Credit Risk Spreads.' *Review of Financial Studies* 10 (2), 481-523

Duffie, D. and Singleton, K. (1998) 'Ratings-based Term Structures of Credit Spreads.' Working Paper, Stanford University

E. Techniques currently used by banks and other lenders

E.1 Decision to lend

Banks carry out their own fundamental analysis into the entities to which they lend money. This will include assessing

- the outlook for the entity's business activities,
- the current financial position of the company (using financial metrics such as leverage ratios and interest cover), and
- the structure of the debt being considered.

These three components are integrated qualitatively to form an overall credit assessment.

The processes used by banks would generally be applied to larger companies with traded debt or equity and would not generally translate to smaller or private companies where risks will be much more idiosyncratic. For example many smaller companies are family-owned in some way and the credit assessment processes that are normally applied would cease to work effectively at this level.

E.2 Monitoring credit exposure

In terms of monitoring the credit exposure banks will typically monitor

- the components of their original lending assessment (e.g. business outlook, etc.),
- CDS markets where these are available (JP Morgan's Orbit system makes live CDS prices widely available),
- credit ratings such the quantitatively-derived assessment provided by Standard & Poor's or the one-year default probabilities based on equity markets provided by Moody's KMV.

F. Credit ratings

F.1 What is a credit rating?

Credit ratings are the most commonly used method of assessing the financial strength of a wide range of commercial entities. They are a reliable guide to the probability of its defaulting on its financial obligations and to its subsequent insolvency. Ratings are reflected through a letter grade e.g. ranging from AAA (strongest) to C (weakest), and then D for default.

Ratings are entity-specific, i.e. each entity in a consolidated group may have its own specific rating. In many cases within a group of companies, the principal subsidiaries may have the same rating as the quoted parent, but not necessarily so.

The rating on a company is an opinion of its general creditworthiness. In addition to ratings on companies (corporate ratings), certain debt issues are also rated (issue ratings). These might be rated higher, lower or the same as the corporate rating, depending on their relative ranking (e.g. secured, unsecured or subordinated).

F.2 Types of credit opinion

Using Standard & Poor's as an example, there are three main types of credit opinion:

Interactive ratings

Interactive ratings are what are generally thought of as 'credit ratings' and indeed in rating agency terminology only interactive ratings are referred to as 'credit ratings'. The other types of credit opinion mentioned below are known as 'credit assessments'.

Companies pay rating agencies to prepare an interactive rating, usually when they wish to issue public debt. Interactive ratings can be on both the issuer and a particular issue of debt. The ratings are 'interactive' as they involve an interaction between the company being rated and the rating agency, so that the agency will often have access to information that is not publicly available. The rating agency will appoint a specialist industry analyst to oversee the rating process which involves input from an experienced rating committee. These ratings provide continuous surveillance of the sponsor and formal reviews at least annually.

A credit report is produced that explains the rationale behind the rating, highlighting industry and company risks. The rationale would also usually contain an 'outlook' statement, indicating whether the rating is likely to change. A positive outlook indicates that the credit rating is more likely to strengthen than weaken, while a negative outlook suggests the opposite. A stable outlook means that no change is envisaged in the near term.

The population of credit ratings of UK entities is increasing rapidly. The majority of top 250 FTSE companies have interactive ratings from one of the major rating agencies.

Private credit assessments (PCAs)

A private credit assessment is an assessment produced by an industry analyst but without access to the confidential business information that would be obtained for an interactive rating.

The output would vary depending on the application and client requirements. It may comprise just a letter grade or it may include a report and rationale. PCAs tend to be credit opinions on the issuer only.

Quantitatively derived assessments

Quantitatively derived assessments are estimates of credit strength derived from publicly available information as well as confidential credit information from credit bureaux and commercial banks. They are available for most UK private companies with the exception of the financial services, not for profit and the public sectors. This information is stored on the rating agencies' databases and then a credit assessment is produced using the agencies' tools.

The credit strength grades are similar to those used for interactive ratings although they are denoted by lower case letters. Standard & Poor's provides quantitatively-derived ratings on 320,000 UK companies with a median assessment of 'bb'.

These are primarily used by financial institutions that wish to gauge the financial strength of a large number of otherwise unrated entities.

F.3 Cumulative default data

Rating agencies have for many years carried out default studies on interactively rated entities. Cumulative default tables are produced which show the percentage of rated entities defaulting over time. These can be used as a predictor of the likelihood of default in the future.

The table below shows Standard & Poor's average default experience for the ratings range AAA to C over a 15-year period.

Cumulative average default rates by year

Year	1	2	3	4	5	10	15
AAA	0.00%	0.00%	0.03%	0.06%	0.10%	0.46%	0.62%
AA	0.01%	0.04%	0.09%	0.19%	0.30%	0.85%	1.35%
A	0.04%	0.13%	0.24%	0.40%	0.61%	1.94%	3.04%
BBB	0.29%	0.81%	1.40%	2.19%	2.99%	6.15%	8.77%
BB	1.21%	3.60%	6.41%	9.00%	11.28%	19.25%	22.70%
B	5.71%	12.49%	18.10%	22.39%	25.43%	33.82%	38.69%
CCC/C	28.96%	38.13%	43.87%	47.70%	51.02%	56.47%	59.36%
Investment Grades (AAA-BBB)	0.11%	0.31%	0.55%	0.87%	1.20%	2.73%	3.96%
Speculative Grades (BB-C)	4.95%	9.80%	14.11%	17.58%	20.28%	28.34%	32.52%

Source: Standard & Poor's Risk Solutions CreditPro ® 7.0

The table shows, for example, that an entity rated BBB has an historical probability of default of 6.2% over a ten-year period. It can be seen that the ten-year default experience increases significantly as credit quality weakens to the CCC/C level, i.e. the historic probability of default over a ten-year period is 56.5%.

F.4 Definition of default

Default occurs when a payment is missed on interest or principal. For the majority of pension schemes, when a company has defaulted on its financial obligations, this will be the point at which there is unlikely to be any more funding available for the pension scheme and recovery for unsecured creditors following default is likely to be very low.

There is likely to be a significant difference between the recovery rates for different creditors from public and private companies. Public companies that raise public debt may have more unencumbered assets that can be shared amongst unsecured creditors. Private companies are more likely to borrow from banks who will generally have a fixed or floating charge on all of the assets on the business. When banks put a company into default it usually means they are concerned that they will not be able to recover the full amount borrowed and therefore when they seize control of the assets there may be very little left for unsecured creditors (as in the case of Rover).

Standard & Poor's has carried out analysis of recoveries by unsecured creditors in the UK, including trade creditors, and observed very low recovery among small to medium enterprises. Unsecured creditors only recover if the value of the assets is superior to that of the bank debt. Only when banks trigger default very early can there be something left.

F.5 Credit ratings compared with market-driven measures

The advantage of credit ratings and credit assessments is that they are based purely on analysis of the financial circumstances of a company. With any market-driven measure it becomes very difficult to differentiate the credit element within the pricing as opposed to market effects (e.g. liquidity, name recognition, recovery prospects). For example, with credit default swaps, prices can react to speculation in the market when a leveraged buy out is anticipated.

Also, unlike market instruments which have very limited coverage, credit ratings and credit assessments cover around 75% of public and private companies in the UK. Assessments for the remainder of private sector entities (financial institutions and not-for-profit organisations) can be carried out on an individual basis for example using a PCA approach.

G. Credit advisory assessments and independent business reviews (IBRs)

Banks and other lenders typically turn to credit advisory specialists when they have concerns that a company may default under the terms and conditions of a loan. This is because default will trigger certain rights for lenders; they will need to understand how they can use these newly acquired rights to protect their financial position in the event of default.

Timing is key. If lenders act too early, they may interfere inappropriately with management's legitimate plans; if they leave it too late, lenders may find that full recovery of the loan and outstanding interest is not one of their options. This is a critical lesson that pension trustees will need to learn in order to act appropriately in the new regulatory environment.

Credit advisory services are provided by accountancy firms, insolvency practitioners and other niche operators. A standard product available in the market is the independent business review (IBR). The content of an IBR will depend upon the nature of the business concerned, the industry sector in which it operates and the geographical spread of its operations. IBRs are typically commissioned by lenders where business or financial conditions have changed, significantly impacting upon the security of the loan.

For example, a start-up operation in the service sector will have few assets and is likely to rely on rapid revenue growth to service its debt. The ratio of net debt: EBITDA may be very high initially, with the expectation it will fall significantly over a three year period. If the revenue growth does not materialise, net debt will remain relatively high and the lender may want management to moderate its growth plans to protect its lending position. The IBR will focus on the revised business plan.

By contrast, a mature company with significant unencumbered property may also wish to borrow because of growth prospects in a sector of its business. Lending (relative to EBITDA) could be justifiably high for an entirely different reason. In this case, the lender may be somewhat unconcerned with revenue growth. The critical issue is rather the recoverability of net assets in the event of insolvency and the IBR will focus on this.

An IBR is intended to achieve the following:

- an independent assessment of the financial strength of the business in the light of changed business/financial conditions;
- a focus on the key financial metrics affecting the security of the loan and associated interest payments; and
- consideration of the recoverability of the loan in the event of insolvency (requiring valuation of the business on a winding-up basis).

In order to trigger an IBR (which is typically paid for by the company), lenders incorporate covenants into their lending terms & conditions. There are three types of covenant:

- *Financial*—financial ratios that are required to be met through periodic testing and reporting to lenders.
- *Positive*—requires the borrowers to supply information or comply with certain requirements.
- *Negative*—a covenant that prevents certain activities, unless agreed to by the lenders (i.e. a promise *not* to do something).

H. Services available for assessing the sponsor covenant

H.1 Services covered

This appendix summarises:

- the independent employer covenant review (IECR) provided by PwC, and
- the sponsor covenant assessment (SCA) provided by Standard & Poor's.

References to these specific services is not an endorsement but for the purpose of illustration and education given that this area is still fairly new and still developing.

Most large firms of accountants provide independent business reviews and have started to target the needs of pension scheme trustees. One firm is promoting a screening service that involves the trustees completing an online questionnaire to determine whether further assessment is required.

H.2 PwC independent employer covenant review (IECR)

Purpose

- It is becoming increasingly important for trustees to be fully engaged with management, in order to develop an understanding of the willingness and ability of the employer to ensure that its defined benefit schemes are adequately funded, such that the schemes can meet their obligations.
- The purpose of an IECR is to provide trustees with an independent assessment of the strength of covenant provided by a principal or participating employer to their scheme.
- This information will be critical when the employer is contemplating corporate activity, particularly if this involves a change in control, a change in creditor priority, or some form of return to equity or subordinated debt holders.
- However, the information should also play a critical role in shaping funding and investment decisions in steady state situations and in helping to anticipate any impending financial difficulties.

Typical contents

The contents of an IECR will be tailored according to the particular circumstances of a given situation. For example, in certain cases the trustees will already be fully aware of the employer's operations, strategy, and group structure and hence the IECR would not comment on these matters. However, if this was not the case, the IECR would include an overview of these areas.

Typically, the contents of an IECR might include:

- an assessment of current financial position as set out in the most recently available balance sheet,
- an analysis of the debt structure and creditor priorities including any parent company or cross guarantees,
- a review of trading projections and cash flow forecasts, in order to assess viability and cash generation capability,
- sensitivity analysis to demonstrate the impact of reflecting different scenarios or flexing key assumptions,
- financial ratio analysis,

- a summary from the modelling of potential outcomes in a hypothetical insolvency—this is critical in terms of helping trustees to understand how the pension scheme's claim ranks compared to other creditors,
- consideration of the options available to trustees moving forward, and
- consideration of other relevant information (e.g. from analysts, rating agencies etc.).

Benefits for trustees

- An assessment of the extent to which the section 75 debt is covered by the sponsor's net assets in the event of insolvency.
- To assist trustees in ensuring that they are at the table when they should be rather than arriving too late (i.e. when the bankers have already taken action in their own interest) and that the company does not take action to further worsen the trustees' position as a creditor.
- Expert analysis of the implications of group debt and guarantee structures (including cross border issues and the interaction of different jurisdictions) in order to assess the scheme's priority relative to other creditors.
- Assistance in forming judgements on the reasonableness of the sponsor's financial projections and its viability.
- Understanding the impact of distress and the need to respond to short timescales.
- Help with engaging with the sponsor to address issues arising and to balance improving the funding position against precipitating a cash crisis.
- Advice on signals to look for that indicate corporate distress and remedies that the trustees can make in those circumstances.

H.3 Standard & Poor's sponsor covenant assessment (SCA)

Purpose

- In making funding and investment decisions, trustees of defined benefit pension schemes need to be confident the sponsor is capable of underwriting the risks in the scheme.
- Deficits in defined benefit schemes are effectively loans to sponsors, and trustees will want to be sure that a sponsor will be able to fulfil its funding obligations.
- An SCA from a rating agency is an assessment of the extent to which trustees will be able to rely on future contributions from their sponsor.
- This type of information is essential for trustees when entering funding negotiations with the sponsor, as highlighted in the Pensions Regulator's codes of practice, or investment decisions.

Analysis included

- A quantitatively-derived credit assessment of the sponsor (where the sponsor does not already have an interactive rating). Credit ratings and assessments are the most commonly used measure of a company's financial strength. The vast majority of employers will not already have a credit rating, so at the centre of an SCA is a credit assessment of the sponsor.
- Availability of additional funding from the corporate group and other sources. This will look at the security offered by formal credit support arrangements through the credit strength of the entity providing support. It also considers any informal ties between group entities and the pension scheme. By considering the credit strength of group entities, potential targets for Financial Support Directions can also be identified.

- The prospects for the industry in which the sponsor operates and how the sponsor is performing relative to that industry. This will give the trustees a broader picture of the sponsor's business and its prospects.
- The susceptibility of the sponsor's financial strength to changes in the scheme's funding level. Schemes can become very large relative to the sponsor and the SCA considers the risk that a change in the sponsor's credit strength could be caused by a change in the scheme's funding level.
- The incorporation of credit strength information into funding plans. On its own, the financial strength of the sponsor is only part of the picture. By using historic default data the SCA is able to place credit information in a funding context and help trustees to determine an appropriate deficit recovery period.
- Credit strength monitoring. It is important that trustees continually monitor the financial strength of their sponsor so they can update their funding plans if necessary. An SCA usually includes a 12 month monitoring facility so that if the financial strength of the sponsor changes the trustees will be notified.

Benefits for trustees

- Trustees will be able to gain an understanding of the financial strength of the sponsor and the extent to which they can rely on future contributions.
- Trustees will be able to demonstrate they have obtained appropriate information before making funding decisions.
- It will help trustees to comply with the Pensions Act and the Regulator's Codes of Practice.
- Member security can be improved by minimising the loss in the event of the insolvency of the sponsor.
- Trustees can monitor their sponsor's financial strength over a 12 month period.
- It is cost effective (between £6,000 and £10,000) and should be accessible to all schemes.

I. Case studies

I.1 Case study 1

The trustees of ABC plc pension scheme were informed by a non-UK public company (XYZ Inc) that the ABC plc was being acquired. The trustees were given assurance that contributions would continue to be made at the existing level, thereby eliminating the deficit over a 15 year period. They were told that the employer covenant would be stronger since they would be part of a larger group with XYZ Inc underwriting the deficit up to the FRS 17 level.

The trustees instructed a credit advisory specialist to advise on the implications of the transaction vis à vis the security of members' benefits. Whilst there were a number of positive features of the deal from the trustees' perspective, the analysis also identified:

- the gearing of XYZ Inc was much higher than ABC plc, and would increase further as a result of the acquisition,
- the ratio of pension contributions to free cash flow reduced significantly after the deal, and
- although XYZ Inc provided a guarantee, this was less than the s75 debt and the major lenders had issued their loans to the operating companies (within which were the bulk of the group's assets)—i.e. the pension guarantee was structurally subordinated to bank lending.

The trustees felt confident to negotiate and achieved the following:

- a significant initial contribution,
- funding of the remaining deficit over five years,
- monitoring rights, and
- covenants in line with those of the banks.

I.2 Case study 2

An established manufacturing company was facing trading difficulties and requested the trustees of its pension scheme accept a lower level of contributions—no more than required by MFR. The trustees, keen to assist the company in its difficulty and ensure jobs were preserved, accepted the proposition, albeit subject to annual review. A year later, the actuary reported that the funding position of the scheme had deteriorated and a higher level of contributions was required to comply with MFR. The company informed the trustees that the extra cash was not immediately available but it was negotiating extra facilities with its bank. In the meantime, the company, which had early adopted FRS 17, announced it was going to have to suspend dividend payments to shareholders because of the size of its FRS 17 deficit.

The bank negotiations and weakness of the FRS 17 adjusted balance sheet caused the trustees to rethink their approach. They hired a credit advisory specialist, enabling them to understand the company's ability to generate sufficient cash, as well as the cover for the s75 debt in the event of insolvency. Recognising they would not be able to collect the desired level of cash, they entered into negotiations with the company and its bankers. The business went through a restructuring, including the disposal of a non-core business. A new funding plan was then put in place incorporating:

- some immediate cash (as a result of the disposal and new money from the bank),
- security over company owned freehold,
- monitoring rights, and
- covenants.