

Pension
Protection
Fund

Consultation on the Future Development of the Pension Protection Levy

November 2008

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Foreword: the evolution of PPF levies

In response to industry demand, we introduced a risk-based component to our levy at the earliest available opportunity, in 2006/07. Then we prioritised simplicity, given the limited information we had about the risks that we were exposed to, and the challenges of implementing a risk-based levy at all. Since then, we have developed our understanding of the risks we face, and this suggests we could improve the fairness of the levy formula. We indicated in last year's consultation our initial thinking on a way forward. We have now developed, with our consultants (Oliver Wyman), and stakeholders (through a Technical Reference Group), proposals to make the levy distribution fairer.

A significant proportion of our total levy estimate reflects long-term risks - a large part of which relates to schemes that initially are well funded and/or whose sponsors enjoy strong solvency. Although these schemes may appear secure, deficits can worsen and sponsor solvency can decline either through a general economic downturn or a company specific problem. And we find that the ratio of long-term risk to short-term risk is significantly lower in the case of weaker schemes than for stronger schemes – though weaker schemes' absolute risks remain higher, both short-term and long-term.

We currently allow for long-term risk in setting the overall level of the levy, but not in dividing the levy between levy payers. As a result, schemes that seem relatively secure in the short-term are paying less than would be justified by their contribution to our long-term risks. Those with greater short-term risk have picked up more than their fair share.

As the distribution of risk alters significantly if a long-term risk measurement is used and as our liabilities are long term in nature, we believe that taking the longer term into account in the distribution would produce a fairer distribution of the levy.

We think the proposals in this paper offer a way to improve fairness as they would result in a more scheme specific measurement of risk. They:

- Continue to recognise short-term risk – to cover the claims we expect under normal circumstances;
- Add a component to the risk-based levy to reflect a scheme's contribution to these long-term risks including through its investment strategy;
- Provide the potential to reduce, in due course, the scheme-based levy;
- Potentially offer lower volatility in individual bills (relative to using the current formula) as schemes' levy bills will be less geared to changes in market conditions.

We are grateful for the expert input we have received in developing our proposals. We welcome your feedback on how best to develop our levy arrangements to take proper account of the risks the PPF faces. Thank you for your continuing support.

Lawrence Churchill
Chairman

Partha Dasgupta
Chief Executive

Chapter 1: Executive summary

1.1. Introduction: why we are proposing to change the levy

- 1.1.1. The Pension Protection Fund (PPF) was established by the Pensions Act 2004 to pay compensation to members of defined benefit schemes where, following employer insolvency, there are insufficient assets in the scheme to pay pensions at least at PPF compensation levels. The pension protection levy is one of four ways the PPF's compensation payments are funded (see para 2.1.3) and is divided into two parts: the risk-based levy and the scheme-based levy. A scheme's risk-based levy is calculated by reference to the risk of its sponsoring employer(s) becoming insolvent, which measures how likely it is that the scheme's members will require PPF compensation, and its funding level, which measures how large its claim on the PPF might be (broadly based on the cost of buying out benefits at PPF compensation levels). This makes up at least 80 per cent of the pension protection levy estimate; the remaining levy is a flat-rate, calculated by reference to the scheme's liabilities.
- 1.1.2. This consultation sets out a possible approach to developing the formula which allocates the pension protection levy between schemes, from 2011/12 onwards, and invites comments. A separate consultation was published on 25 September 2008 to deal with changes that are proposed for 2009/10, due to be finalised with a policy statement and the final determination in November 2008.
- 1.1.3. No levy is ever popular, even if the reasons for it are well understood and draw widespread support. However, feedback from our stakeholders has emphasised to us the importance of ensuring that the levy is, and is seen to be, fair and of giving consideration to the stability and predictability of the levy. The proposals in this document represent an approach that could help address both these areas.
- 1.1.4. This consultation document builds on the analysis we published last year,¹ which showed that there is a mismatch between the risks schemes pose to us and the share of the levy they are charged. This is because the total levy charged is based on risk over a number of years and on the possibility of claims exceeding average levels (what can be termed unexpected risk)² whereas the distribution of the levy between schemes is currently based purely on short-term expected risk.
- 1.1.5. The August 2007 consultation proposed a short-term fix to partially address this issue (adjusting the starting and end points of the taper of funding levels

¹ The Consultation on the Future Development of the Levy, August 2007

² The Board measures unexpected risk over a five-year period, and adopts what it considers a best practice approach in financial regulation – an economic capital model. In an FSA environment, commercial insurers are expected to measure risk against a possibility of failure of 1 in 200 over 1 year, broadly equivalent to the PPF's 1 in 40 over 5 years. So unexpected risk is the level of claims the model tells us we might experience once in 40 five year periods.

at which underfunding risk is calculated as a fixed percentage of liabilities) and proposed a programme of work to develop a measure, recognising the potential impact of unexpected risk, so as to address it more comprehensively. This document delivers on that commitment, providing a specific approach to reflecting schemes' long-term risk as well as their short-term risk to the PPF. As part of this, it is proposed to recognise the influence of investment strategy on those risks.

- 1.1.6. This consultation does not cover the level at which the aggregate levy (the levy quantum) may be set in future years.

1.2. The levy principles: fairness, simplicity and proportionality

- 1.2.1. In developing these proposals, the Board followed its principles of fairness, proportionality and simplicity. These principles were consulted on in the first consultation on the levy and have informed all developments of the levy to date, which are described in Chapter 2.

- 1.2.2. There are two kinds of fairness that are relevant when considering the pension protection levy:

- *fairness over time* – so that different generations of levy payers don't subsidise one another;
- *fairness at a point in time* – so that different groups of contemporary levy payers don't subsidise one another.

- 1.2.3. In applying the principle of simplicity to these proposals, we have sought to ensure that the levy is understandable to schemes, that the data is simple to provide and collect and that the calculation of invoices is manageable.

- 1.2.4. Proportionality has been considered in seeking to ensure that changes in levy as a result of funding and insolvency changes better match the actual impact of the changes.

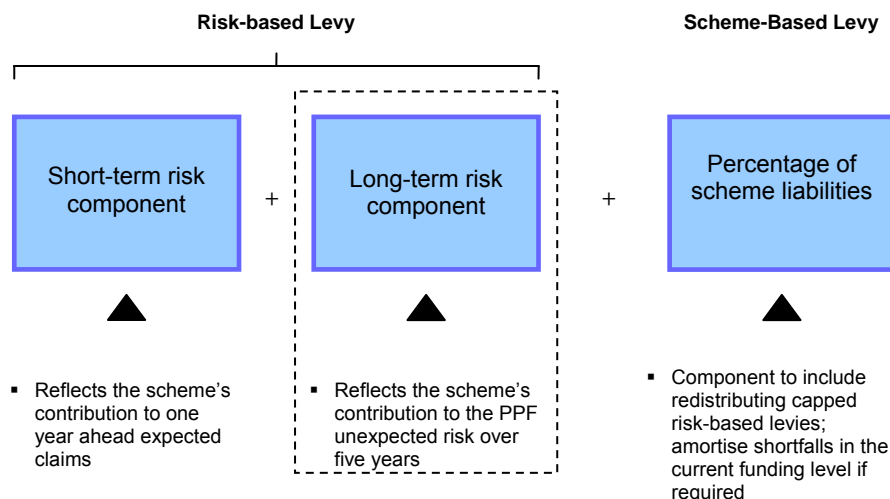
1.3. How we propose to change the levy formula

- 1.3.1. In developing the levy formula to take account of long-term risk, we propose that an element of the levy should continue to reflect short-term risk, though this would be at a lower overall level than so far. To compensate, a second component will be added to the risk-based levy, which will use the same data inputs (i.e. scheme assets, liabilities and insolvency probabilities). This new component will directly reflect the contribution of schemes to long-term risk – so that we do not need to scale up short-term risk to cover unexpected risk using the scaling factor.

- 1.3.2. The scheme-based component will be retained, though not necessarily at the existing proportion of the total levy. The scheme-based levy currently provides a flat-rate payment that partially (though not wholly) compensates for the inability of the current levy formula to allow for long-term risk.

- 1.3.3. Making these changes will alter the distribution of the levy between schemes, but nothing in these proposals will cause a change in the overall amount to be collected. No change in the Board's current policy of charging £675 million indexed to wage inflation is implied. A decision on that would be consulted upon and taken in the light of the position as 2011/12 approaches as it would be if we made no change to the distribution formula (and as it will be in autumn 2009 for the 2010/11 levy year).

Current Levy formula



- 1.3.4. Short-term risk will be calculated broadly as now, by multiplying a one year insolvency probability, P and an underfunding measure, U . There will be differences in the way that the underfunding figure is determined from the information provided by schemes. Instead of multiplying each scheme's liabilities by a factor of 1.21, to provide a margin allowing for potential movements in scheme deficits, a scheme-specific measure will be used to alter the assets figure, reflecting the investment risk of the scheme over a one year period. For a scheme with average investment risk this would lead to around a 10 per cent reduction in the assets figure used in calculating underfunding. There will be a scaling factor, c , known as the rate for short-term risk which will be published before the start of the levy year. This will adjust the amount raised from schemes to ensure that in aggregate it collects a reasonable proportion of the levy – given the Board's view of aggregate short-term risk³ and considerations such as fairness, levy stability at scheme level and affordability.

- 1.3.5. The new component of the risk-based levy will reflect each scheme's contribution to long-term risk. Again, a measure of insolvency (Q) and of underfunding (V) will be multiplied together, but we will adjust these two measures from the one year measures (U and P) to reflect the likelihood that a scheme's employer fails and the impact a failure has if claims are high over a five year period. In other words, the new insolvency probability (Q) is

³ Measured by the long-term risk model (LTRM)

a probability that is conditional on overall insolvencies being high. Table 8 in Annex B shows this conversion, which is carried out for each employer separately in the case of a multi-employer scheme, before a weighted average scheme score, Q , is produced.⁴

- 1.3.6. Similarly, the figure used as a measure of the scheme's potential underfunding (V) will reflect what might happen to the surplus/deficit of a scheme in adverse conditions. The extent to which a scheme's surplus/deficit is altered by changing economic conditions will depend significantly on its investment risk; that is the risk associated with the nature of a scheme's investments when compared with the nature of its liabilities. And so our measure of long-term risk is significantly more sensitive to investment strategy than the current risk-based levy.
- 1.3.7. The additional component of the risk-based levy will have a weighting (w), called the rate for long-term risk, to scale down the sum collected from the long-term risk component. This means that collectively schemes pay an annual contribution toward the potential unexpected claim.⁵ The rate for long-term risk will be set to deliver an overall levy consistent with the total quantum the Board plans to raise.
- 1.3.8. The proposed new formula is:

$$RBL = c \times U \times P + w \times Q \times V$$

Where:

- P is the scheme's short-term insolvency probability
 - Q is the scheme's long-term insolvency probability
 - U the scheme's short-term underfunding
 - V is the scheme's long-term underfunding:
 - c is the rate for short-term risk, and
 - w is the rate for long-term risk.
- 1.3.9. As approximately half of the PPF's risk exposure relates to future levels of scheme funding, we believe it appropriate to take account of investment risk in the levy, without imposing significant additional burdens on schemes. We propose to make use of the information already gathered through Exchange, the scheme return database. The information includes a breakdown of scheme assets by broad asset category and information on the proportion of liabilities in respect of active, deferred and pensioner members, which can be used to estimate investment risk relative to the liabilities for each scheme.

⁴ Note that the conversion from P to Q is made using the probability of insolvency associated with a failure score, not the failure score itself.

⁵ In principle this is comparable to the cost of capital charge a commercial insurer might apply to its economic capital. In practice, the PPF's levy has been set at below the true rate for risk a commercial insurer would apply, so that the weighting in our impact analysis (see Annex A) is rather lower than a true cost of capital would be.

- 1.3.10. While this cannot take account of all the complex ways in which schemes manage their investment risk, it provides a simple way of calculating comparative investment risk. We would be willing to consider more precise but more complex approaches at a later stage if there is sufficient interest in our doing so.
- 1.3.11. In principle, the introduction of investment risk as a levy factor might be expected to incentivise schemes to reduce the level of risk in their portfolio to lower their levy. However, our analysis (included at Annex E) suggests that levy changes will be small in comparison with the additional return expected from return-seeking assets. For this reason we do not expect a significant effect on schemes' investment strategies or, therefore, on asset prices.

1.4. When will the changes take effect?

- 1.4.1. We recognise that significant changes of the type proposed should be introduced in a measured way, providing schemes with a real opportunity to respond to the changes. Initial discussions with stakeholders have suggested there is a range of views about speed of implementation, but that most favour implementation in 2011/12. We are seeking views on this, though with an expectation that it would be preferable to implement in respect of 2011/12. This means the 2010/11 levy will be charged on a basis similar to 2009/10.

1.5. What will the impact on schemes be?

- 1.5.1. Our impact analysis shows that half of schemes would have had a lower levy if the new formula had been used in 2008/09, a quarter see a fall in levy of up to a quarter and one in ten see their levy halve. The proportion with a lower levy would have been larger had we not modelled a reduction in the scheme-based levy from 20 per cent to 10 per cent of the total levy – a potential change that would tend to benefit the relatively few large schemes.
- 1.5.2. Since a change in the formula changes the distribution of the levy but not the amount collected, there are inevitably schemes that will pay more. The analysis suggests that half of schemes see a higher levy. One in six pay a bill up to a quarter higher, with just over one in ten seeing their bill double.⁶ While this will clearly be unwelcome, we consider that such a re-allocation in bills brings them more closely in to line with the risks that schemes pose to us. It is also the case that in general these are schemes that still pay a low levy compared to the size of scheme (i.e. as a proportion of liabilities).
- 1.5.3. It is noticeable (see Figures A & B) that the redistribution with the new formula generates relatively modest increases in levies as a proportion of scheme liabilities for those that will have higher bills. By comparison, for those who benefit from a lower levy the reduction is dramatic as a proportion of liabilities.

⁶ By comparison the current formula led to one in seven of schemes paying double their 2007/08 levy in 2008/09.

Figure A: Increase/Decrease in levies by funding ratio and credit rating

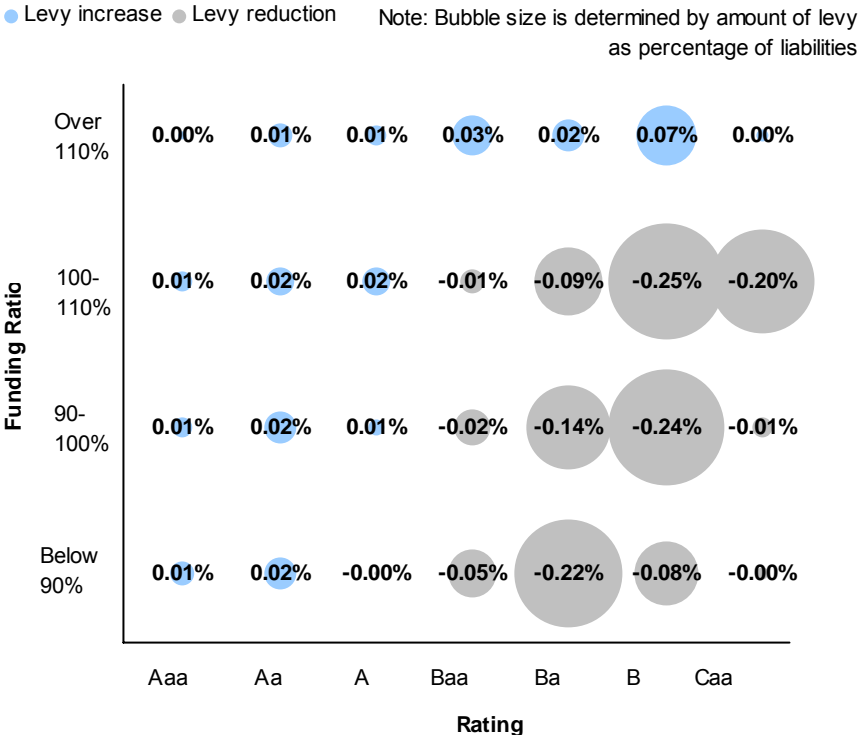
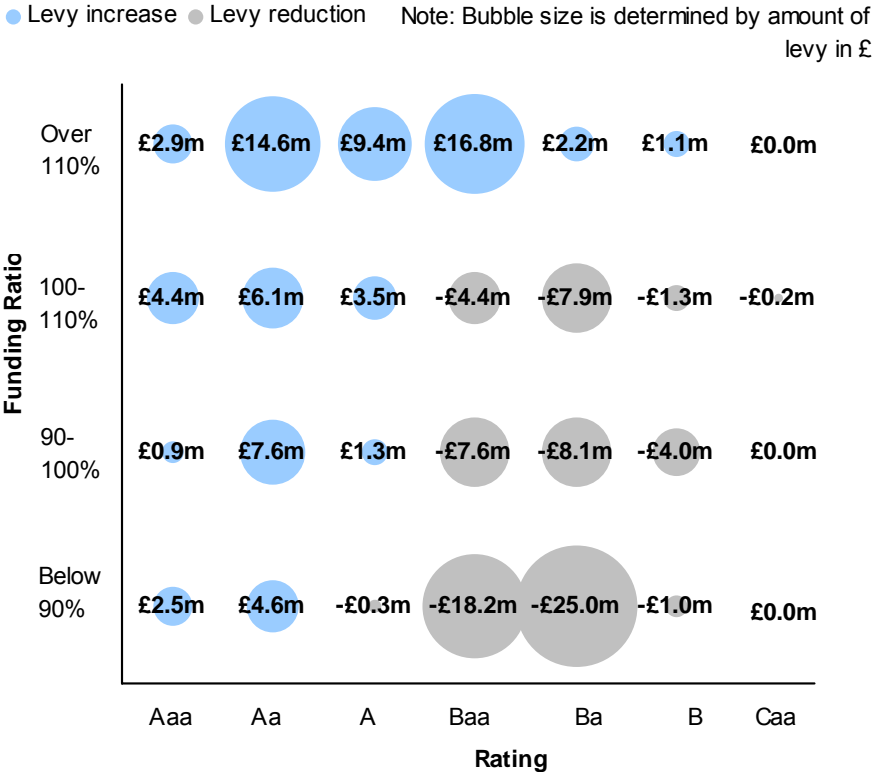


Figure B: Increase/Decrease in levies by funding ratio and credit rating



Note that the figures above show the net effect on levies, so within the groups that experience an increase in levy bills, there will still be schemes that see a reduced levy.

- 1.5.4. Another characteristic of the new formula is that fewer schemes pay either very small or very large levies (compared to their liabilities). Seventy per cent of schemes will pay between 0.04 per cent and 0.5 per cent of liabilities whereas 52 per cent do so with the existing formula. A reduction in the proportion with high levies makes the levy more affordable – reducing by more than a third the number of schemes paying a levy that is greater than 0.5 per cent of their liabilities. A reduction in schemes with very low levies reflects the reality that nearly all schemes contribute to our risk to an extent.
- 1.5.5. The other significant change for schemes is likely to be in terms of the stability and predictability of the levy. The new formula will tend to need less dramatic adjustment of parameters to achieve a stable levy quantum than the current formula does. Of course this does not guarantee a particular scheme will experience bills that are more stable than in the past. That will depend on a range of factors from the individual circumstances of the scheme, to the degree of volatility in markets. That said, the new formula is less geared to market conditions. As is shown in Chapter 6, for a general change in insolvency or in asset values, the new formula would require just over half the adjustment to the rates for short-term risk and long-term risk to scale bills up or down to the same quantum (when compared to the scaling up or down that is required by the existing formula).
- 1.5.6. The feedback we have received from stakeholders suggests that volatility of levy bills year-on-year is seen as a significant issue. The new formula is less geared to market conditions, so other things being equal, this would mean levy bills could overall be less volatile than if the existing formula is used. The interest in levy stability also suggests a case for using the two levy parameters, *c* and *w*, flexibly – which could include taking account of the effect on bills rather than (for example) always seeking to collect the Board's best estimate of expected claims through the short-term risk component in the levy.
- 1.5.7. The sensitivity of the current formula both to changes in D&B failure score for schemes with scores close to 100 and to changes in funding levels of schemes with funding levels near the threshold of the levy taper (i.e. close to 120 per cent funded), has direct and indirect implications for the stability of schemes' risk-based levies:
 - Other things being equal, moving from a UK failure score of 100 to 99 (which increases *P* from 0.01 per cent to 0.03 per cent) triples a scheme's bill; alternatively, assets increasing from 100 per cent to 105 per cent of liabilities could reduce the levy by a quarter;
 - The need to raise a total levy consistent with the PPF's financial requirements means that a change in other schemes' funding or insolvency measures could require the levy scaling factor to be adjusted.

- 1.5.8. By comparison, under the new formula the effect on the levy of a change in a scheme's short term insolvency score is reduced – for example, an increase in a scheme's P from 0.01 per cent to 0.03 per cent typically results in a 106 per cent increase in its risk-based levy.⁷ This is because the long-term insolvency element does not respond proportionately to changes in short-term insolvency.
- 1.5.9. We have improved the predictability of the levy for 2009/10, by measuring underfunding and insolvency risk at 31 March 2008, allowing us to consult on the levy parameters (scaling factor, cap etc.) in the September before the start of the levy year, and publish the final levy scaling factor well in advance of the start of the levy year. We expect to adopt a similar approach for 2011/12 so that the Determination for that year is published in advance, with all the final parameters – at which point schemes should be able to estimate their levy for that year reliably.

1.6. Why should we change the levy formula?

- 1.6.1. We recognise that the ideas contained in this consultation would make the calculation of the levy more complex. That additional complexity should be weighed against the increase in fairness, and also the reduced sensitivity of the formula to market conditions, that will result. We believe this change improves the levy because:
- The improvements in fairness are dramatic, with levy bills more closely representing the real risk schemes pose to the PPF. Over £130m is switched from schemes that are currently paying more than would be suggested by their share of our risk to schemes that are currently paying less than their share of our risk would suggest they should;
 - It should also improve affordability by considerably reducing burdens on those least able to contribute to funding their pension scheme – for example, those with a weak employer. By comparison those schemes seeing an increase in levy are generally still paying a levy that is low in relation to the size of the scheme;
 - It offers the prospect of a reduction in volatility of levies at individual scheme level (though this would clearly depend on market conditions) going some way to addressing the single biggest concern expressed to us in the past by stakeholders;
 - The levy remains simple in principle – with the inclusion of a component for long-term risk - the risk that claims are worse than expected (“average”) claims over the next five years;

⁷ Levy calculated on the assumptions used in the impact analysis, for a scheme with average asset allocation and a typical proportion of active/deferred/pensioner member liabilities.

- The data requirements on schemes do not change as a result of the Board's proposed changes – so there is no additional burden on schemes.

Taken together, we consider that this makes a case for moving to the new formula, though we would be interested in any alternative proposals that stakeholders consider could improve fairness and lower year-on-year volatility of levy bills.

1.7. Consultation arrangements

- 1.7.1. A number of detailed questions are set out throughout the document. In addition, we would be grateful for views on the overall proposition.
- 1.7.2. Responses to this consultation are requested by Friday 13 February 2009. A policy statement, setting out the Board's considered view, in the light of comments received and any other pertinent factors, will be published subsequently.

Chapter 2: Background and development of the levy

2.1. Introduction to the Pension Protection Fund

- 2.1.1. Employees join occupational defined benefit pension schemes expecting to receive the pension that they have been promised. This promise is realised if there are sufficient scheme assets to meet pension liabilities as they fall due, or the sponsoring employer is able to make good any shortfall. In the great majority of cases members receive the pension they have been promised.
- 2.1.2. However, if an employer becomes insolvent there are sometimes insufficient funds in the pension scheme to meet the liabilities in full. In some cases, prior to the establishment of the PPF, employees contributed to a pension scheme for their entire working life, only to discover that when the scheme wound up in the immediate run-up to their retirement, they received a much lower pension than they expected. This led to hardship and to reduced confidence in occupational pension schemes.
- 2.1.3. The Pension Protection Fund was established by the Pensions Act 2004 (the Act),⁸ to pay compensation to members of occupational defined benefit and hybrid pension schemes, following sponsoring employer insolvency, where there are insufficient assets to pay the Pension Protection Fund level of compensation.

The PPF is funded by a combination of:

- The assets transferred from schemes for which it has assumed responsibility;
 - Recoveries of money, and other assets, from those schemes' insolvent employers;
 - An annual levy raised from eligible pension schemes; and
 - Investment returns on assets held by the PPF.
- 2.1.4. While the Act required the PPF to pay compensation and gave the Board the power to set the levy, it did not provide a Government guarantee. It follows that the protection that the PPF offers is not, and cannot be, absolute; its capacity is equal to levy payers' willingness and ability to pay levies.

2.2 Development of the pension protection levy

- 2.2.1. In 2005/06, the PPF's first year of operation, each eligible scheme paid an initial levy, set by the Secretary of State for Work and Pensions, calculated according to the number and type of its members. This raised £138 million out of an estimated £150 million. The risk-based levy (RBL) was introduced following the first consultation on the pension protection levy in July 2005.⁹

⁸ *Pensions Act 2004* http://www.opsi.gov.uk/Acts/acts2004/pdf/ukpga_20040035_en.pdf

⁹ *The Pension Protection Levy Consultation Document*
http://www.pensionprotectionfund.org.uk/rbl_consultation.pdf

The levy principles of fairness, simplicity and proportionality were defined with reference to information available to us at the time and the need to introduce the levy quickly but without placing an unreasonable burden on schemes.

- 2.2.2. The July 2005 document explained that the formula would also include a levy scaling factor, calculated by dividing the estimated total amount of levy to be raised by the total short-term risk of all eligible schemes. The levy scaling factor is necessary because the total short-term risk exposure of eligible schemes does not match the amount the Board decides to collect. The levy scaling factor therefore matches the amount collected from individual schemes to the total levy estimate.
- 2.2.3. The 2006/07 levy estimate of £575 million was published in December 2005,¹⁰ along with the fixed risk-based levy scaling factor of 0.53. The certificates for recognition of contingent assets, deficit reduction contributions and section 179 valuations were also made available to schemes at this time. Fixing the levy scaling factor had the effect of exposing the levy estimate to short-term fluctuations in risk, which resulted in the levy being under-collected by £295 million.
- 2.2.4. The approach to the levy scaling factor was refined in 2007/08, with an indicative figure of 2.02 published with the levy estimate, but the final figure of 2.47 not being published until just after the start of the levy year. This reduced the exposure of the scaling factor to short-term market movements and ensured we would have the most accurate data available for its calculation. The likelihood of a repeat of the previous year's under-collection, save for the impact of risk-reduction measures, decreased in turn.
- 2.2.5. The disadvantage of this change was that schemes were unable to know how these risk reduction measures affected their levy bills until after the calculation of the levy scaling factor in April. This made it difficult for schemes to accurately predict their levy bills before the start of the financial year. This issue peaked in the 2008/09 levy scaling factor calculation, where significant volatility of the levy scaling factor between the indicative and final numbers was surprising for the PPF as well as for schemes and had a negative impact on schemes' financial planning.
- 2.2.6. The proposal to bring forward the underfunding and insolvency risk measurement dates to 12 months before the start of the levy year from 2009/10, made in our August 2007 consultation,¹¹ will reduce this financial planning problem. The 2009/10 scaling factor is based on data collected by 31 March 2008, with some assumptions made for additional contingent assets, deficit reduction contributions and successful appeals of D&B failure scores. In September 2008, the PPF announced a figure of 2.22, subject to

¹⁰ *The Pension Protection Levy Consultation Document - Dec 2005*
http://www.pensionprotectionfund.org.uk/rbl_consultation_dec2005.pdf

¹¹ *Consultation on the Future Development of the Pension Protection Levy*
http://www.pensionprotectionfund.org.uk/levy_consultation_aug_07.pdf

consultation. The final figure will be published in November 2008. This should be a significant aid to schemes' financial planning, as advance notice of the final factor will be given.

- 2.2.7. The adoption of assumptions in the advance calculation of the levy scaling factor exposes the PPF to the possibility of under-collection or over-collection against the levy estimate, should the level of risk-reduction measures and D&B appeals over the next six months deviate significantly from the PPF's experience to date. This means that certainty about the size of schemes' levy bills for schemes creates uncertainty about the amount of levy collected by the PPF and consequent uncertainty about the recovery of the PPF's deficit.
- 2.2.8. The August 2007 document also outlined our increasing understanding of the long-term risks faced by the PPF and the emerging mismatch between the short-term approach to distributing the levy and the long-term approach to measuring economic risk.
- 2.2.9. Our initial case for movement towards a levy based on long-term risk caused many to suggest we might reconsider our stance on investment risk. We had previously consulted on whether to include this as a risk factor in December 2006.¹² We concluded that it would not be proportionate to introduce it at that time for a number of reasons, particularly the fact that it would have resulted in a relatively small redistribution of around three per cent of levy sums, set against a cost for schemes of implementation of possibly as much as £20 - 40 million per annum. Having since made progress in our research and understanding of investment risk, we consider this consultation to be the appropriate point to revisit it.
- 2.2.10. The November 2007 consultation response document¹³ provided further information on long-term risk and explained that, under the current method of calculation, the levy parameters (the funding limits at which the risk-based levy become a fixed percentage of liabilities) would need to be revised. This was as a result of a significant reduction in short-term risk that wasn't matched in the long-term, with the potential consequence, under the 2007/08 taper, of a disproportionate redistribution of the levy.

¹² *Consultation on the possible inclusion of investment risk as a risk factor in the risk-based levy*
http://www.pensionprotectionfund.org.uk/investment_risk_doc_dec_2006.pdf

¹³ *The Response to the August 2007 Pension Protection Levy Consultation*
http://www.pensionprotectionfund.org.uk/levy_response_doc_nov_07.pdf

Chapter 3: The risk profile of the PPF

3.1 Introduction

- 3.1.1. This Chapter explores the risks the PPF faces and the relationships between them. The Chapter starts with a review of these risks and in particular the insolvency risk of scheme sponsors and the risks presented by pension schemes funded below the level required to pay compensation at the level provided by the PPF. It then explains how the Board has modelled the interactions between these risks to project the range of outcomes that could occur, and describes our combined risk measure (also referred to as the economic levy).

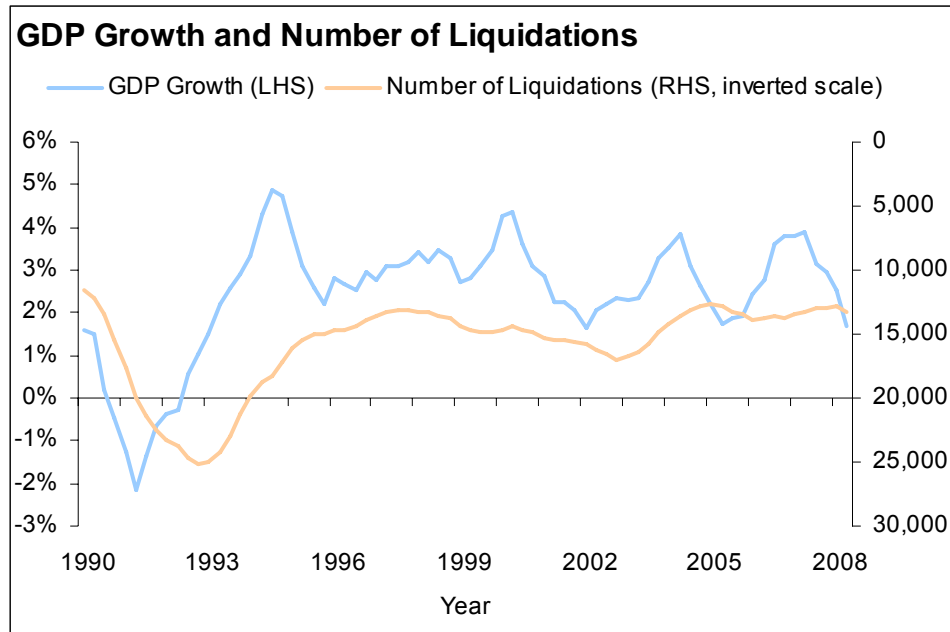
3.2 The PPF's risks: their nature and interaction

Insolvency Risk

- 3.2.1. The PPF is exposed to the insolvency risk of employers of eligible schemes. Insolvency events can arise both through causes that are company specific and for reasons linked to the economic cycle.
- 3.2.2. The rate of insolvency varies dramatically over time. In part it will depend on the state of the economy; typically a peak in insolvencies follows an economic downturn by 18-24 months. But some downturns have little impact on insolvency rates, and at other times insolvency rates stay high even when the economy is buoyant. This makes predicting insolvency rates challenging.
- 3.2.3. Chart 1 plots UK corporate insolvencies against economic growth. It shows the variability of insolvency risk and a relationship, with a time lag, between the level of insolvencies and growth. In the early 1990's, the peak in the number of insolvencies (this appears in Chart 1 as a dip in the curve as the insolvency scale is inverted) occurred some 18-24 months after the trough of the recession. The level of insolvencies rose by 10.5 per cent in the third quarter of 2008, up 26 per cent on a year earlier. With the economy having entered a sharp downswing, further increases in insolvencies are likely in coming quarters.¹⁴
- 3.2.4. In examining Chart 1, however, it is important to recognise that movements in the UK-wide liquidation rate may not always match those in the number of DB schemes entering PPF assessment. The PPF-relevant universe of company sponsors contains a higher proportion of large, established businesses than the economy taken as a whole. This may point to a lower PPF-relevant insolvency rate during a downturn.

¹⁴ Insolvency Service figures for the second quarter of 2008 show a 15 per cent rise on the same period in 2007.

Chart 1: UK Real GDP Growth and the Liquidation Rate

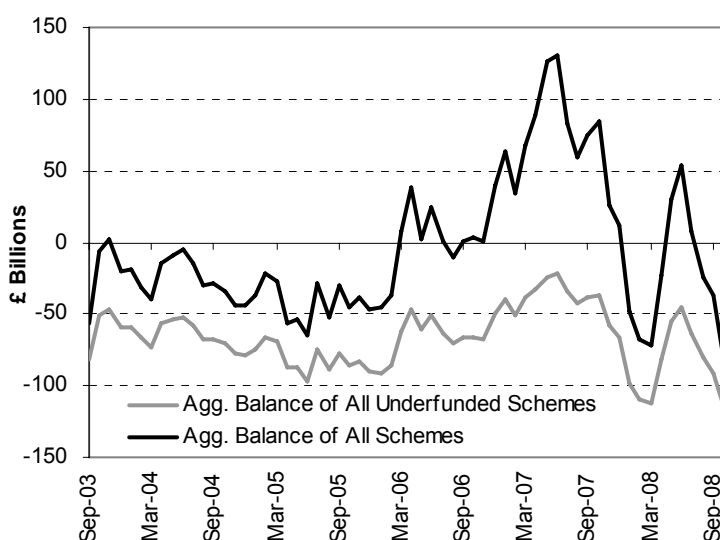


Source: Office of National Statistics, Insolvency Service

Underfunding Risk

- 3.2.5. The other main component of the PPF's risk is that schemes with a failed employer may prove to be underfunded. Scheme funding is particularly variable reflecting the wide range of factors that impact upon the value of a scheme's assets and liabilities. For instance, scheme assets can be affected by financial market conditions and the nature of a scheme's asset allocation. Liabilities change for reasons including changes in the discount rate, membership changes, service entitlements, mortality experience and any revaluation or indexation.
- 3.2.6. Chart 2 plots the value of the PPF 7800 index which shows how scheme funding varies as a result of movements in the value of assets and liabilities as market conditions change. It shows that the aggregate funding of all schemes, as well as the aggregate deficit of all underfunded schemes (i.e. those schemes where the assets are insufficient to cover the s179 liabilities), can vary sharply over a short period. For example, the aggregate funding position of schemes at the end of February 2008 was over £100bn lower than a year previously.

Chart 2: Aggregate funding balance (assets less liabilities, s179 basis) of schemes in the PPF universe



Source: The Pension Protection Fund, PPF7800 Index

Other Risks

- 3.2.7. The PPF is increasingly exposed to market risks in respect of its own portfolio of investments and liabilities, as these grow over time. The assets of the Fund comprise those assets received from schemes that are transferred to the PPF, levy proceeds and recoveries from insolvent employers. Assets are managed by fund managers, in accordance with the Statement of Investment Principles.¹⁵
- 3.2.8. Finally, the PPF faces the systematic risk that improvements in life expectancy occur at a faster pace than expected (a contributor to what is generally known as longevity risk). For example, understating the life expectancy of a 60 year old man by two years could understate the liability for meeting his pension by five per cent.

Interrelationship between insolvency and underfunding risk

- 3.2.9. To make the picture more complex, insolvency and underfunding risks are interrelated, though to an unpredictable extent. For example, a future period of higher insolvency rates might be associated with a fall in pension scheme funding levels, as equity markets and bond yields might also reflect the poor economic conditions associated with rising insolvencies. However, there is no certainty that this would be the case, and the extent of such a linkage might depend on the causes of any change in insolvency rates. While a general economic downturn might cause a rise in insolvencies and a fall in pension scheme funding, a sector specific shock might trigger a rise in insolvencies but have a more limited impact on scheme funding.

¹⁵ For more detail see http://www.pensionprotectionfund.org.uk/index/about_the_ppf/investment.htm

3.2.10. Uncertainty about how insolvency and underfunding risk combine poses a significant challenge for the PPF in assessing scheme risk. The experience of the Pension Benefit Guaranty Corporation (see case study – next page) provides an example of the possibility of potential unexpected claims crystallising and in particular illustrates that large schemes, run by previously secure businesses, are likely to contribute significantly to unexpectedly large claims.

Case Study: the Pension Benefit Guaranty Corporation

Established in 1974, the Pension Benefit Guaranty Corporation (PBGC) has a broadly similar mandate in the USA to the PPF in the UK.

Until 1995, the PBGC had generally operated with a smallish deficit. Claims rose in the early 1980's and 1990's recessions, but not to the level found in the early 2000's, and so, after a period of good investment returns and relatively low claims in the later 1990's, the PBGC had a surplus of over \$9bn in 2000.¹

Claims rose markedly between 2001 and 2005 following a downturn predominantly felt in the industrial sector. The PBGC saw a marked deterioration in its net financial position after 2000 and at the end of 2005 showed a deficit of \$22.8bn as a result of a large increase in claims, falling interest rates, which increase the value of liabilities, and falling asset values. From 2000 to 2005, claims totalled more than \$25bn as compared with only \$6.3bn in the previous 24 years. This large increase in claims was the product of a series of extreme events between 2000 and 2005.

The large bankruptcies in these years were sector specific with the largest claims concentrated among airlines and steel makers. Notably, many of the largest claims on the PBGC during this period were linked to large companies including United Airlines (\$7.1bn claim in 2005), Bethlehem Steel (\$3.7bn in 2003), US Airways (\$2.9bn in 2003 and 2005), LTV Steel (\$2.0bn in 2002, 2003 and 2004) and National Steel (\$1.2bn in 2003).

The PBGC uses stochastic modelling to evaluate its expected claims and its exposure to larger "catastrophic" claims. In the *Pension Insurance Modelling System*, a 1998 paper examining the results of its model, the PBGC estimated that the expected level of claims over the following 10 years would be around \$900m per year and put the likelihood of claims exceeding \$2.1bn per year in 1998 financial terms at 10 per cent.³ The actual claims which occurred over that period were just below this 10 per cent level when discounted to 1998 terms. In the paper, the PBGC estimated its net financial position in 2008 would be a surplus of around \$8.8bn (or roughly 10 times expected claims), with a 10 per cent chance of a deficit of more than \$6.3bn in 1998 terms and \$9.9bn in 2007 terms. In fact, at the end of 2007, the PBGC deficit stood at a little over \$13bn, which had a likelihood of between 5 per cent and 10 per cent.

This experience demonstrates that extreme events can and do happen, and the importance of having modelling capabilities which demonstrate the potential range of financial outcomes in future. The PPF's recognises this possibility and that our financial modelling and planning has been developed accordingly.

¹ Figures on the PBGC are taken from <http://www.pbgc.gov/docs/2005databook.pdf> and relate to the Single Employer Program.

² US equity market change based on S&P500 1 January 1995 to 31 December 1999, Bloomberg.

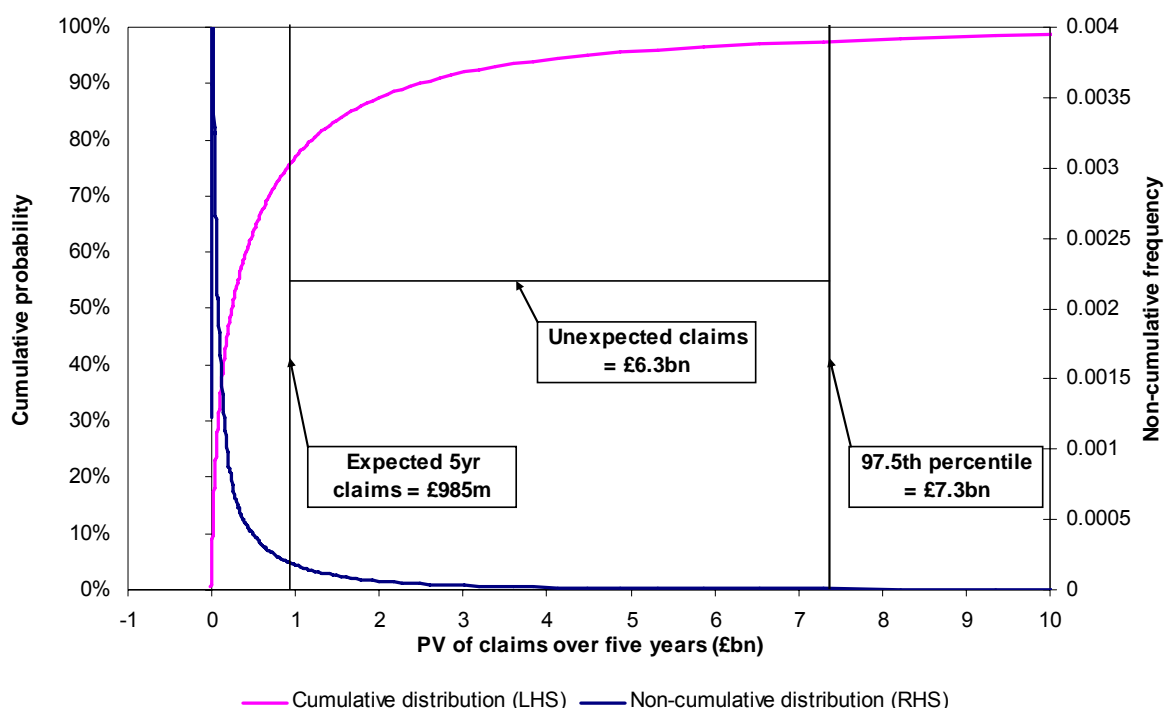
³ See <http://www.pbgc.gov/docs/1998databook.pdf>

3.3. Measurement of the risks using the long-term risk model

- 3.3.1. With such an uncertain environment, the Board required an analysis that could illustrate the full range of risk the PPF faces and indicate how likely adverse outcomes are. To achieve this it has developed a stochastic model, the long-term risk model (LTRM), combining in-house resources and expertise from leading external providers. An information paper on the LTRM was published in August 2007, titled: *Modelling Uncertainty - An Introduction to the PPF long-term risk model*.¹⁶
- 3.3.2. The Board uses the model to help understand and quantify the risks facing the PPF in the future and thereby to help assess the level of resources that are required to meet future potential liabilities. The Board focuses on risks over a five year time horizon. Accordingly, the outputs of the LTRM are presented as a probability distribution showing the likelihood of the various outcomes over five years.
- 3.3.3. What is striking about the results is that the average outcome of a relatively limited claim is accompanied by less likely but far more adverse scenarios. Examples of these for the year 2006/07 were included in the information paper. The following graph shows results for runs based on data available to the PPF in March 2008, with expected claims of £985 million over five years, and a potential unexpected claim of an additional £6.3 billion (so total claims are £7.3 billion). These represent an increase in the level of risk, which is consistent with what we'd expect to see following changes in the economic environment.

¹⁶ [http://www.pensionprotectionfund.org.uk/long-term risk model paper aug 2007.pdf](http://www.pensionprotectionfund.org.uk/long-term%20risk%20model%20paper%20aug%202007.pdf)

Chart 3: Five year claim distribution – showing expected and unexpected risk



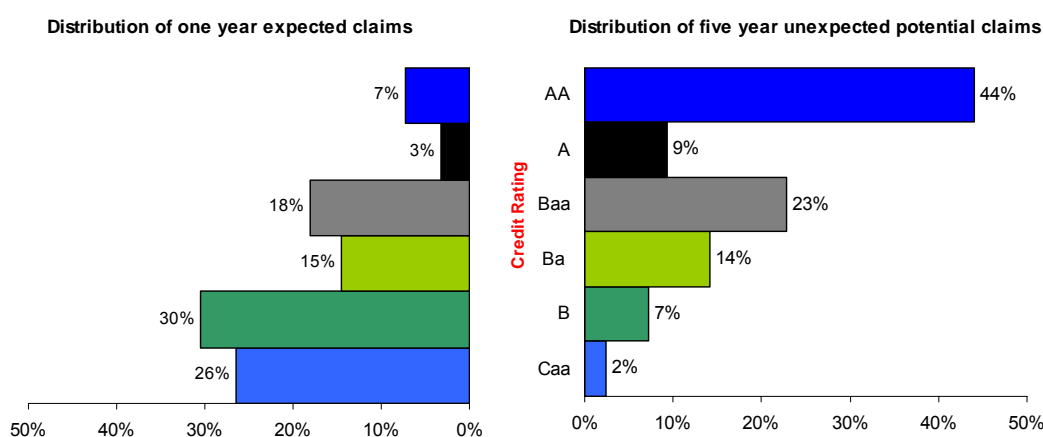
- 3.3.4. It is possible to attribute this potential extreme claim to the main risk components, to see the relative scale of different risks to the PPF and the impact of diversification (because risks are not fully correlated, the PPF's total risk is lower than the sum of its parts).
- 3.3.5. Another key conclusion, from comparing the composition of claims at the average level and in more adverse scenarios, is that the contribution an individual scheme makes to average and potential unexpected claims¹⁷ may be very different. In other words, adverse claims experience isn't just a result of the same schemes entering the PPF with worse funding, but also reflects that schemes that did not contribute significantly to claims in more benign conditions make up a disproportionate part of claims in adverse economic conditions.
- 3.3.6. This conclusion fits with the experience of the PBGC in the US, where in 2000/01 and 2001/02 claims in respect of a handful of large schemes that may previously have been regarded as low risk made up a significant proportion of its growing deficit.
- 3.3.7. We can see these results in the following charts. Sponsoring employers rated Aa & A (by Moody's Investor Service)¹⁸ together represent only seven per cent of one year expected claims but 44 per cent of five year unexpected

¹⁷ An unexpected claim is a low likelihood, high-impact claim on the PPF, as shown on the "tail" of the probability curve. The PPF uses an average drawn from the 94th to 99th percentile of the distribution to measure tail scenarios

¹⁸ The credit rating Aa is equivalent to a D&B failure score range of 96-100. For a full table comparing credit ratings with D&B failure score ranges, please see Table 2 of Annex A.

claims, the Board’s preferred measure of long-term risk. By comparison, schemes with Caa rated employers represent 25 per cent of one year expected claims, but only two per cent of unexpected claims. This does not mean that poorly rated employers fail less often in adverse economic circumstances (like all schemes their insolvency probability will rise in adverse conditions), simply that they make up a smaller proportion of the failures because previously stable employers also fail in significant numbers.

Chart 4: Comparison of expected and unexpected claims by credit rating¹⁹



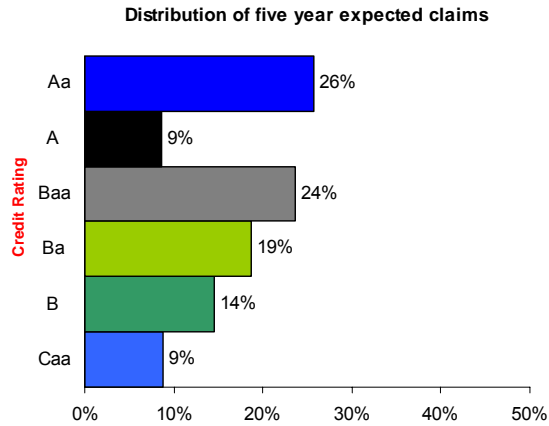
3.3.8. The difference in distribution between one-year expected claims and five-year unexpected claims is the consequence of two distinct changes. The first is the move from the one year to the five-year risk horizon, the second considering schemes’ contributions to adverse claims rather than average claims.

3.3.9. As Chart 5 shows below, moving to a five-year period has the effect of increasing the relative contribution from the schemes rated Ba and above, while reducing the relative contribution to claims from lower rated schemes. Under normal economic circumstances, there is a relatively low probability of an Aa or A rated scheme sponsor experiencing insolvency. Over the five-year horizon, this probability rises as a result of credit migration,²⁰ and it is conceivable that a larger number of schemes with Aa or A rated sponsors will seek PPF assistance. These schemes would tend to be large. Hence the risk from Aa and A rated schemes is much greater over the five than the one-year horizon.

¹⁹ The PPF uses credit ratings in addition to D&B scores for the analysis in this document and its Annexes. This is because there is more historical data available on failure scores. A comparison of failure scores and credit ratings has been included at Table 2 of Annex A.

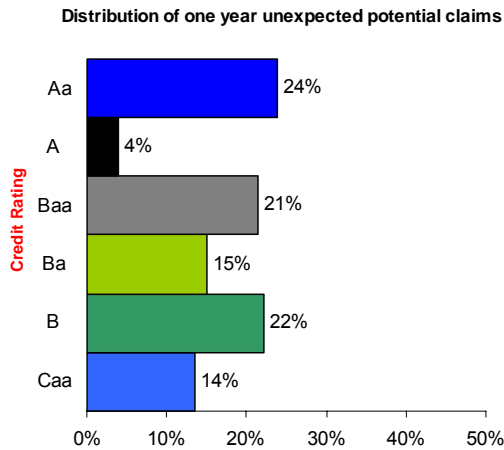
²⁰ The average insolvency probability of the best rated schemes – in a closed group - worsens over time because no scheme can improve its rating and some schemes ratings will deteriorate. Conversely the poorest rated schemes tend to either fail or recover over a period - so that the average credit quality of the survivors improves.

Chart 5: Distribution of five year expected claims



3.3.10. The second aspect is the move from expected to unexpected risk. Chart 6 below illustrates the distribution of one year unexpected claims. The effect is similar to the move from the one to five year horizon, but with a less pronounced effect on all schemes except those rated Aa. The justification for the increase in unexpected claims from stronger credits is that one would generally only expect these schemes to require PPF assistance in an adverse economic environment. Such environments are modelled in the tail of the LTRM output distribution, and hence claims from strong credits are much greater in these scenarios.

Chart 6: Distribution of one year unexpected potential claims²¹



²¹ Note: this graph shows unexpected claims at the 97.5th percentile for consistency with five year case above. In practice, if one focussed on one year unexpected risk it might be more appropriate to use the 99.5th percentile of the risk distribution (equivalent to the FSA measure for financial institutions). In that case the distribution of claims by credit rating would more closely resemble the five-year graph above. The distribution would, however, be more volatile.

3.4. Developing a risk measure from long-term risk model data

- 3.4.1. The previous paragraphs show the difference in contribution of schemes to claims when claims are high compared to when claims are at average levels. A levy formula that took account only of the average scenario may not distribute the levy fairly – if ignoring what happens when claims are high makes a significant difference.
- 3.4.2. To test this possibility, the Board has developed a combined risk measure or economic levy. This combines the cost of expected claims (average claims) with an allowance for the cost of adverse or unexpected events, an approach widely used by financial institutions. Annex D contains further detail on how we calculate the combined risk measure using the long-term risk model.
- 3.4.3. The Board recognises that there are a range of risks, such as miscalculation, in developing a model, which can limit the degree of confidence with which conclusions may be drawn, and that it is appropriate to take steps to minimise such risks. Annex D contains a summary of work undertaken to quality assure the PPF's long-term risk model.

3.5. Implications for developing the levy distribution formula

- 3.5.1. The 2007 levy consultation set out the Board's emerging concerns about the potential mismatch between a levy amount set addressing the risks that the PPF is exposed to over a five year period and a levy distribution formula focused entirely on short-term risk. In particular, it showed that short-term risk and long-term risk – particularly those risks connected with adverse outcomes – were not distributed in the same way. As the levy scaling factor used to scale up the short-term risk measure ($U \times P$) to collect a levy consistent with long-term risk increases, the distortion worsens.
- 3.5.2. As an interim measure to counteract this problem, the Board adjusted the calculation of underfunding by increasing the start of the levy taper (the funding level above which the assumed level of underfunding becomes a fixed percentage of liabilities). While this resulted in a fairer levy, it was only a partial solution, because it could only shift the distribution by reference to one of the two risk factors – underfunding – and it still focussed exclusively on expected claims on insolvency risk.
- 3.5.3. The current levy formula scales up short-term risk to allow for long-term risk. The Board considers it preferable to have a levy formula with two separate components for expected short-term risk and for unexpected risk over a five year period. Changes in individual levy bills could then correspond more closely with movements in individual scheme risk.
- 3.5.4. In response to the 2007 consultation, there was majority support for the proposal to evolve the levy formula to take account of long-term risk, with 58 per cent of respondents favouring the proposal (and 39 per cent opposed),

though it was difficult for some stakeholders to offer a firm opinion without a specific proposal, such as that being offered in Chapter 4 of this consultation. One of the key reasons for opposing the move among levy payers commenting was a feeling that the proposals would result in a shift of the levy toward larger schemes. As will be seen in Chapter 6, our impact analysis suggests that the proposed changes will, in fact, be broadly neutral between schemes of different sizes.

- 3.5.5. In addition to the possible unfairness of a short-term approach to raising the levy, there is also a practical disadvantage: increasing the levy on a scheme sharply at the point sponsor solvency weakens means that the highest levies are borne by those least likely to receive the employer contributions to pay them, so scheme assets must be used to meet the levy. A bill paid with the assets of a scheme that subsequently requires compensation is of no benefit to the PPF.
- 3.5.6. Experience suggests that this is a real issue: in a number of assessment period cases, the final levy before insolvency was met from scheme assets even where there was a commitment from the employer to cover the cost. In a situation where claims experience was adverse, this could mean that the existing modelling understates the level of risk the PPF is exposed to, therefore overstating our capacity to recover from a deficit. A levy formula that identifies risk and charges for it a number of years before an employer fails would reduce the impact of this problem.

Chapter 4: Our proposals for developing the levy formula

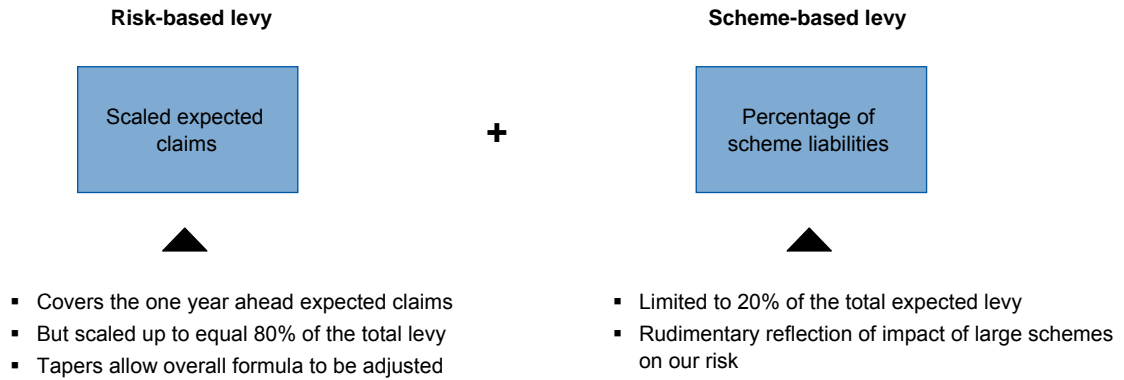
4.1. Introduction

- 4.1.1. In Chapter 3 we showed that the contribution of individual schemes to short-term risk and long-term risk could differ substantially. This leads to the conclusion that the fairness of the levy could be improved by taking account of both short-term risk and long-term risk when charging a levy.
- 4.1.2. This Chapter considers how the risk-based levy could be developed to better reflect the PPF's risks and to create a better fit between the risks each scheme poses and its levy. The approach proposed builds on the existing structure and is evolutionary rather than revolutionary in nature.
- 4.1.3. The Board's proposed approach to improve the fairness of the levy distribution is set out below.

4.2. The new formula for the risk-based levy

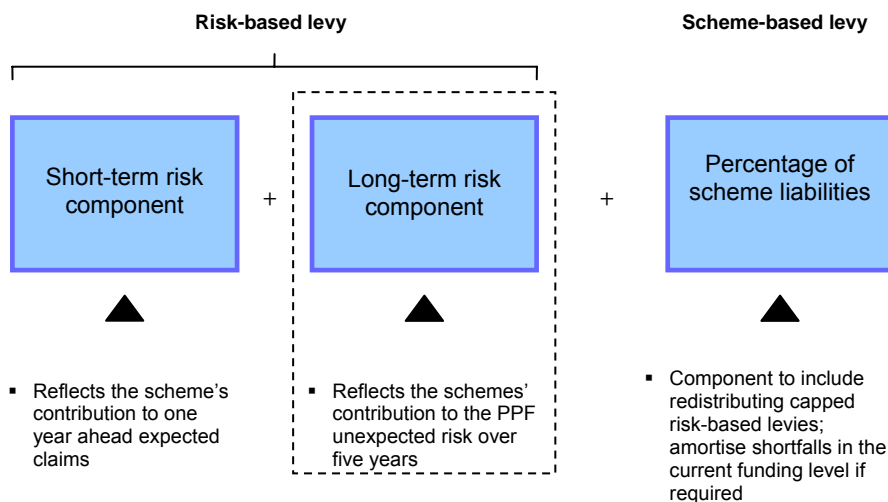
- 4.2.1. The current levy formula (as depicted in Figure C) consists of two components. The first component is a risk-based levy that incorporates a short-term (one year) insolvency probability (P) multiplied by a measure of short-term scheme underfunding risk (U), and then scaled up or down using the levy scaling factor (LSF) to the levy amount set by the Board.
- 4.2.2. The risk-based levy is subject to two separate caps, restricting the highest insolvency probability to 15 per cent and the maximum risk-based levy to one per cent of liabilities. Capped risk-based levy is redistributed to uncapped schemes through adjustment of the LSF . For schemes funded between 121 per cent and 140 per cent, the measure of underfunding is replaced by one of a set of fixed percentages of liabilities (the levy taper).
- 4.2.3. The second component is a scheme-based levy which is a fixed percentage of the scheme liabilities.

Figure C: Current levy formula



4.2.4. The proposed formula for the risk-based levy has two elements: the first is based on the short-term risk (reflecting contributions to one year expected claims); the second on long-term risk (reflecting contributions towards the potential cost of unexpected claims). The latter is similar to the approach used by an insurer applying a unit cost of capital to an economic capital figure, though the PPF will adjust the weighting to achieve a more stable levy quantum.

Figure D: Proposed levy formula with second risk-based component



4.2.5. The first element of the risk-based levy will be similar in approach to the current RBL in that it is the product of a one-year insolvency probability and a one-year expected deficit. The Board does, however, propose a change in the way that underfunding is calculated, taking account of the short-term volatility in deficits through a discount on asset values instead of the current inflation of liabilities (by 21 per cent).

4.2.6. The long-term risk element will use insolvency and underfunding figures that have been adjusted to approximate the impact a scheme is expected to have on the PPF in the event of extreme claims over the following five years. This amount will be scaled down by a weighting factor, reflecting that the PPF is

not aiming to collect all the funds to meet a potential future extreme claim but rather to charge a small proportion of it, building up over a number of years part of the funds needed to meet such a claim.

4.2.7. As will be explained below, the building blocks for this additional component can be based upon the existing data provided by schemes, so there will be no additional information burden.

4.2.8. The proposed risk-based levy can be expressed by the following formula:

$$RBL = c \times U \times P + w \times Q \times V$$

Where:

- *P* is the scheme's one-year insolvency probability;
- *Q* is the scheme's conditional five-year cumulative insolvency probability; it measures the chance of insolvency within five years if economic conditions lead to an "unexpected claim" (the conversion from *P* to *Q* has been developed by the PPF, see 4.2.10 onward);
- *U* is the one year measure of underfunding;
- *V*, is a conditional measure of underfunding: on average to what level would the scheme be funded if it is part of an "unexpected claim" over five years (the conversion from s179 information, developed by the PPF is set out at 4.2.14 onward);
- *c* is the rate for short-term risk; and,
- *w* is the rate for long-term risk.

4.2.9. The one-year insolvency probability *P* will, as now, be derived from the failure scores provided by the Board's insolvency risk score provider, currently Dun & Bradstreet. Where a scheme has more than one employer, the approach for calculating the scheme's *P* from the participating employers' *p* scores will remain as now.

4.2.10. This information also provides the basis for calculating the scheme's conditional five year insolvency probability *Q*, which indicates the insolvency risk posed by a scheme's employers in the event that unexpected risk does crystallise. The *q* for a UK employer can be found in the table in Annex B, which provides a conversion of each UK *p* probability to a *q* probability. All single-employer schemes with the same *P* have the same *Q*.²² The translation from *p* to *q* will be the same for overseas employers. So schemes with overseas employers can estimate the *q* that would apply to them using the nearest equivalent *p* score.

4.2.11. For multi-employer schemes the calculation of the overall scheme *Q* from participating employers' *q* figures is covered below at 4.2.31.

²² It is not the case that all multi-employer schemes with the same *P* will have the same *Q*. The section below on multi-employer schemes explains that *p* scores will be converted to *q* scores for each employer in the scheme and then a weighted average *Q* produced from the *q* scores obtained. This means two multi-employer schemes with the same *P* score could have different *Q* scores.

- 4.2.12. The conversion table has been developed using the outputs of the long-term risk model to see how likely employers with a given short-term risk of insolvency are to fail over a five year period assuming that claims are high overall. Annex B details the approach used. The table in Annex B sets out examples of Q values for a sample of one-year probability values. The actual table for the 2011/12 levy will be published in the draft 2011/12 levy determination, at which point it will be possible to comment on the methodology used. It may be necessary to review the transformation for successive levy years, though it is not expected to be a frequent occurrence.
- 4.2.13. It can be seen that employers with a low short-term insolvency risk see a greater increase in their five year stressed risk than those with higher one year risk. This is consistent with the finding, in paragraph 3.3.7, that schemes with a good credit rating contribute proportionately much more to the PPF's potential unexpected claims than they do to expected claims.
- 4.2.14. The underfunding measures, U and V, are estimated by the difference between the value of the liabilities on an s179 basis and the market value of the assets, reduced by factors to account for the effect of financial market volatility on deficits (i.e. impacts on both assets and liabilities are considered).
- 4.2.15. The Board proposes that this adjustment should be a scheme-specific adjustment to the value of scheme assets based on an investment risk factor. The risk factor calculated from the scheme returns is a measure of the volatility in the scheme funding ratio as a result of changes in the value of scheme assets and liabilities, calculated at the measurement date.
- 4.2.16. The discount applied to the asset value is greater in the formula for V than for U because investment risk is greater over five years than over one year and because V is an estimate of the funding position under adverse market conditions (in which asset values are likely to be depressed and bond yields low – increasing liabilities). The calculations for U and V are:

$$U = L - (1 - 0.9 \times \sigma) \times A \text{ (or zero if the calculated U is negative)}$$

$$V = L - (1 - 3.4 \times \sigma) \times A \text{ (or zero if the calculated V is negative)}$$

Where:

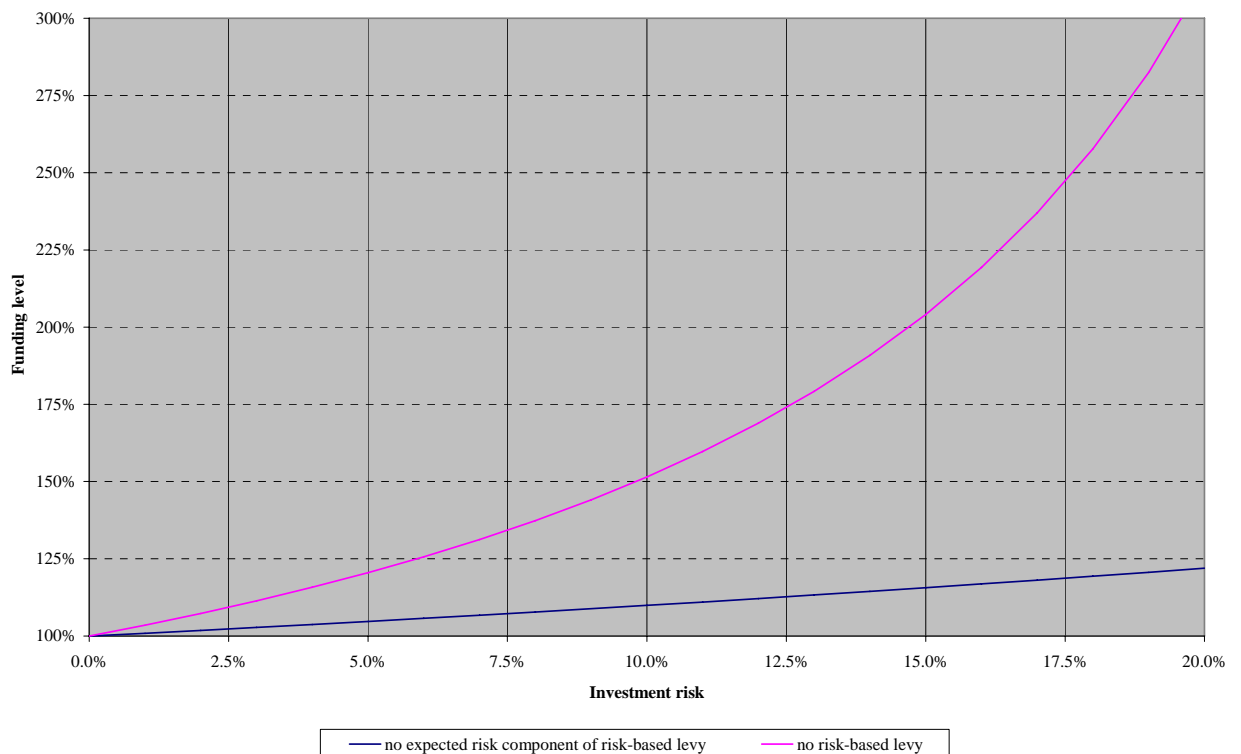
- L represents section 179 liabilities;
- A represents scheme assets; and
- σ represents scheme investment risk.

- 4.2.17. Scheme investment risk provides a measure of the volatility of scheme deficits by measuring the correlation between different assets and liabilities of the scheme. To use it to produce an appropriate underfunding figure it needs to be scaled either for one year or for five years.
- 4.2.18. Scheme investment risk (σ) could be calculated by the PPF based on information already supplied by schemes, or in the longer term calculated by schemes to better recognise their particular position. Where schemes have

σ calculated for them, based on scheme return data, the method for converting the data into σ will be published in the determination for that levy year. It may be necessary to review the transformation from time to time, though it is not expected to be necessary to do so annually.

- 4.2.19. The following Chapter weighs up the pros and cons of different approaches to determining schemes' investment risk. Further details on the calculation of the investment risk factor are included in Annex C.
- 4.2.20. The range for scheme investment risk has been estimated to be between two per cent (an asset allocation of 100 per cent bonds) and 17 per cent (an asset allocation of 100 per cent equities), for schemes with an average liability profile. For an average scheme, investment risk is 10.5 per cent, implying roughly 10 per cent and 40 per cent discounts for the average asset allocation for U and V respectively. By contrast, for a scheme with no investment risk, the level of underfunding would be the liabilities minus the assets.
- 4.2.21. Moving to taking account of scheme-specific investment risk means there will no longer be a single point at which schemes will cease to pay a risk-based levy. Instead, it will depend upon a scheme's investment risk. The following chart shows the minimum funding level to pay no risk-based levy for different levels of investment risk.

Chart 7: The funding level at which schemes pay no risk-based levy



Scaling factors

- 4.2.22. The rate for short-term risk (c) for the first component (the U x P) of the risk-based levy allows this element of the levy to be adjusted. Doing so determines the split between the two parts of the risk-based levy – how much is charged for short-term risk and how much is to constitute the contribution toward long-term risk.
- 4.2.23. The rate for long-term risk (w) applied to the second component (the unexpected risk) will be determined by the Board in order to achieve the levy quantum it wants. For our impact analysis we used a rate of 8.60 per cent.
- 4.2.24. The Board considers it necessary to have the capacity to adjust the rate for short-term risk (c) and the rate for long-term risk (w) annually, to achieve a stable and suitable overall levy and ensure that the expected and unexpected claim terms are at appropriate levels. They will be updated in the relevant year's levy determination.
- 4.2.25. The Board is likely to wish to set a rate for short-term risk (c) that takes account of its view of short-term risk, as measured by the long-term risk model, so the scaling factor will not necessarily be 1. For our impact analysis we used a scaling factor of 1.16 (compared to the 3.77 levy scaling factor produced for the same data using the existing formula).²³
- 4.2.26. There are a number of reasons why the PPF's expected claims are different from the simple product U x P. These were explored in last year's long-term risk model paper and are principally that:
- U and P are not independent, the long-term risk model can take account of their co-variance, whereas the simple formula does not;
 - The PPF expects to make recoveries in relation to debts owed by sponsors to their schemes (s75 debts), which it is reasonable to reflect at an aggregate level but would be impossible to model at scheme level;
 - The LTRM takes account of insolvency information from a range of sources and this may lead to a different assessment of insolvency risk.
- 4.2.27. In addition to their assessment of short-term risk, the Board may also have regard to other considerations such as the impact on fairness, levy stability and affordability of potential combinations of rate for short-term risk (c) and rate for long-term risk (w).²⁴ For example, when short-term risk is rising, it is likely that long-term risk is also rising (albeit that it may be doing so at a slower rate) but if the PPF maintained a fixed overall levy quantum, scaling

²³ Given the sharp rise in short-term risk between 2008/09 and 2009/10, resulting in a lower LSF of 2.22 for 2009/10, achieving a stable split between expected and unexpected risk would imply a scaling factor close to 1.

²⁴ Since these considerations are essentially judgemental, it has not been possible to reflect them in setting c and w figures for the impact analysis, and this has been based directly on LTRM expected claims.

U x P to charge the expected claim could mean the contribution for long-term risk (the levy's second component) falling dramatically. For this reason it may be appropriate to dampen the effects of changes in short-term risk.

- 4.2.28. The example in Box 1 shows how the risk-based levy is calculated for a scheme, based on the scaling factors used in the impact analysis.

Box 1: Calculation of the risk-based levy under the new formula

Scheme N is 90% funded, with £10m liabilities and £9m assets. Assets are split with 60% invested in equities and 40% in bonds. Liabilities are allocated 70% to active/deferred members and 30% to current pensioners. The scheme has a single employer with insolvency risk, p , of 1.02%.

The asset allocation and active/deferred/pensioner split result in an investment risk (σ) of 11.5% (see Annex C for calculation method).

$$U = 10,000,000 - (1 - 0.9 \times 0.115) \times 9,000,000 = 1,931,500$$

$$V = 10,000,000 - (1 - 3.4 \times 0.115) \times 9,000,000 = 4,519,000$$

According to the full p to q conversion matrix (see Table 8 in Annex B), p of 1.02% equates to q of 9.5%. As the scheme has a single employer, the scheme's P and Q figures are 1.02% and 9.5%. (Box 2 shows a multi-employer example).

Taking $w = 0.086$ and $c = 1.16$, as in our impact analysis, Scheme N's RBL is:

$$\text{RBL} = 1.16 \times 0.0102 \times 1,931,500 + 0.086 \times 0.095 \times 4,519,800 = \text{£}59,780$$

Capping the levy

- 4.2.29. In the past there have been caps both on the insolvency risk and on the total risk-based levy. The Board's proposals assume that the caps will continue, but that they will be subject to review as now. In the impact analysis it has been assumed that the existing caps remain unaltered.
- 4.2.30. One of the effects of introducing the new formula is to reduce the need for capping. It is proposed therefore not to redistribute capped levy by increasing the risk-based levy for uncapped schemes. In future the Board will aim to rely on the scheme-based levy to cover the contributions foregone.

Q 1: Do you agree that the PPF should keep the two caps on the risk-based levy under review to seek to maintain the affordability of the levy?

Multi-employer schemes

- 4.2.31. For schemes with more than one associated employer, the insolvency risk in the first element of the risk-based levy will be calculated as now, with a weighted average of insolvency probabilities used to create P. For the second element, individual employer's insolvency probabilities will be translated into a q figure, before then being combined in a weighted average Q.²⁵ Box 2 shows how this will work

Box 2: Calculation of multi-employer long-term insolvency risk, Q			
Scheme R has three employers A, B, and C with the following key details			
Company	No. of members	Employer p probability	
Company A	1,000	1.02%	
Company B	41	2.69%	
Company C	275	0.30%	
The weighted average insolvency probability, P is:			
$P = (1.02\% \times 1,000 + 2.69\% \times 41 + 0.30\% \times 275) / (1000 + 41 + 275) = 0.92\%$			
To calculate Q for the scheme, first take q scores (from Annex B table 8) then combine:			
Company	Members	Employer p score	q score
Company A	1,000	1.02%	9.5%
Company B	41	2.69%	16.7%
Company C	275	0.30%	4.7%
$Q = (9.5\% \times 1,000 + 16.7\% \times 41 + 4.7\% \times 275) / (1000 + 41 + 275) = 8.7\%$			

The scheme-based levy

- 4.2.32. The scheme-based levy has in the past provided a cross-subsidy that partially compensated for the lack of an element in the levy reflecting long-term risk. With the introduction of an additional factor there may in the future be a case for re-considering the level of the scheme-based levy. At a minimum, the scheme-based levy would need to cover the redistribution of risk-based levy from capped schemes, and potentially contribute towards deficit reduction. One possible trigger for a reduction in the scheme-based proportion could be the PPF's recovery of its deficit.
- 4.2.33. The Board will continue to keep the balance between risk-based and scheme-based levies under review and to set appropriate parameters in the

²⁵ Note: this provides a different, and lower, Q score than would be obtained by translating the P score into a Q score directly.

levy determination. To provide an indication of the potential impact of the switch from using scheme-based levy to contribute to covering long-term risk to using an additional component of the risk-based levy, in the impact analysis in Chapter 6, a scheme-based levy of 10 per cent has been assumed to provide an indication of the potential impact of the change.

Q 2: Do you consider that the scheme-based levy should be reduced when the PPF is no longer in deficit, or alternatively at some other point?

4.3. The handling of contingent assets & deficit reduction contributions

- 4.3.1. The Board wishes to encourage schemes and their sponsoring employers to take steps to reduce their risk and has therefore recognised a range of contingent assets. These assets will continue to be recognised following the proposed changes to the levy formula, though the precise way in which allowance is made for their effect may alter in accordance with the different treatment of asset and liability figures in calculating scheme funding. The aim, as far as practicable, is to simulate the underlying economic reality of the protection offered: though it is recognised that there are limits to what can be achieved while maintaining a relatively simple approach.
- 4.3.2. In the current formula, liability figures are adjusted to reflect the volatility of scheme funding, whereas in the future the adjustment will be made to asset values.
- 4.3.3. The Board's intention is to base the choice about whether a contingent asset is added to scheme assets before or after the investment risk is calculated and scheme assets are discounted on whether the market value of the contingent asset itself may fluctuate. So a type B contingent asset, which represents a charge over property or equities that can fluctuate in value, would be added to the assets of the scheme before they are discounted for investment risk.²⁶ A type C contingent asset, such as a letter of credit, is not subject to fluctuation in value and so would be added once the asset figure had been adjusted for investment risk.
- 4.3.4. Adding a contingent asset to a scheme's assets before the scheme's investment risk is calculated means that the asset itself affects the level of investment risk.²⁷ Box 3 below shows how this would work.

²⁶ In a situation where an asset is used which exceeds the maximum value of the contingent claim, the lower of the maximum claim and the discounted market value of the whole asset will be used.

²⁷ To assess the impact on investment risk of adding an asset to the scheme it is necessary to calculate the investment risk before and after the inclusion of the asset. One cannot simply consider the volatility of the asset in isolation. For example, it is not necessarily the case that adding a new asset will increase investment risk if the asset is more volatile than the existing assets – since it may improve the diversification of the portfolio.

- 4.3.5. The treatment of a type A contingent asset will remain broadly the same as in 2008/09, so that the insolvency risk of the guarantor will be substituted for that of the sponsor, where this results in a lower insolvency probability. Limited type A guarantees will result in partial credit, as now, though the condition could be relaxed slightly, so that a contingent asset guaranteeing 100 per cent funding rather than one guaranteeing 105 per cent funding would suffice for full recognition.

Deficit reduction contributions

- 4.3.6. The treatment of deficit reduction contributions certified to the PPF is expected to be similar to that at present. It is proposed that the amount certified will be added to the scheme asset total after scheme assets have been rolled forward to the measurement date. It will be assumed that the DRC has been invested in line with the asset split for existing assets (rolled forward to the measurement date), and the total assets (including DRC) discounted to allow calculation of U and V.

General questions on our proposals:

- 4.4.1 In addition to comments on specific aspects of the consultation, we would be grateful for views on the overall proposition:

Q 3: Should the PPF now move to include unexpected risk in the risk-based levy on the basis proposed?

Q 4: If so, on what timescale should it be introduced – in 2011/12 as suggested, or in an alternative levy year?

Box 3: Calculation of the risk-based levy, including contingent assets

Developing the example in box 1, Scheme N is 90% funded with £10m liabilities and £9m assets. Assets are divided into 60% equities and 40% bonds. Liabilities are allocated 70% to active/deferred members and 30% to current pensioners. The scheme has an insolvency risk (P) of 1.02%.

The above characteristics combine to produce an investment risk of 11.5%.

Consider the effect on Scheme N of implementing the following contingent assets:

- (i) A type A contingent asset, a guarantee from parent company M, with an insolvency risk of 0.03% for either the whole of s75 debt or at least 105% of s179 liabilities.

Impact: This substitutes the insolvency probability of the guarantor for that of the scheme sponsor in both the calculation of P and Q. Considering P, for example, 0.03% is much lower than 1.02% and hence the scheme should see a significant reduction in its risk-based levy.

- (ii) A type B contingent asset representing security over a freehold building worth £1m.

Impact: This type B contingent asset is itself subject to fluctuations in value. For that reason the contingent asset should be included in the calculation of investment risk and then discounted with the other assets. So assets are effectively now 54% equities, 36% bonds, 10% property. The total assets of the scheme including the contingent asset (£10million) are then discounted using the new investment risk coefficient (10.7%) in the calculation of U and V.

$$\begin{aligned}U &= 10,000,000 - (1 - 0.9 \times 0.107) \times 10,000,000 \\ &= 963,000\end{aligned}$$

This is a reduction of £968,500 on the U calculated in box 1. V would also reduce. As a result the levy is reduced.

- (iii) A type C contingent asset - a letter of credit for £1million.

Impact: Type C contingent assets are not generally subject to variations in value. So the contingent asset is excluded from the calculation of investment risk and is not discounted. It is then included in U and V, so £9m of scheme assets is discounted according to the investment risk coefficient (which remains 11.5%), while £1m would enter the equation without discount. Take the equation for U as an example:

$$\begin{aligned}U &= 10,000,000 - [(1 - 0.9 \times 0.115) \times 9,000,000 + 1,000,000] \\ &= 931,500\end{aligned}$$

This is a reduction of £1m on the U calculated in box 1. V would also reduce by £1m. As a result the levy is reduced.

Chapter 5: Measuring scheme-specific investment risk

5.1. Introduction

- 5.1.1. The Pensions Act 2004 made specific allowance for inclusion in the levy of a factor relating to investment risk.²⁸ The Board consulted on whether to introduce such a factor in 2006. Following that consultation, the Board concluded that it was not appropriate to introduce an investment risk factor at that time.
- 5.1.2. In the context of a review of other aspects of the levy formula it seems appropriate to look again at investment risk. A key reason for revisiting this issue is that changes in the approach to charging for the levy may render investment risk more significant in assessing a scheme's risk. More generally, the external environment is constantly developing.
- 5.1.3. This chapter proposes a relatively simple approach, built on existing data, for including investment risk in the levy formula, while indicating the possibility of a more complex approach (at least for some schemes) following further development and consultation. Both of these could have a significant impact on the accuracy and fairness of levy bills.

5.2. The 2006 consultation on investment risk

- 5.2.1. The 2006 consultation on investment risk concluded that, while including investment risk made sense in principle, the relatively slight impact (as things stood then) on the distribution of the levy was insufficient to outweigh the practical difficulties of implementation. However, the consultation exercise also made clear that the balance of the argument could well alter over time.
- 5.2.2. The consultation document looked at evidence available from eligible schemes about their investment strategy. It was striking that most schemes had broadly similar asset allocations.
- 5.2.3. Trends over time showed a strong movement from UK equities to a more international portfolio and a shift in proportion from equities overall to bonds, but a significant proportion of this appeared to be a valuation effect rather than evidence of an active shift in investment strategy. At the same time, there was evidence that some schemes were looking at strategies such as liability driven investment and diversification.
- 5.2.4. To support the consultation the Board asked KPMG to model the impact of introducing an investment risk factor. Based on the information then available, this suggested that only around 3 per cent of the risk-based levy would be likely to be redistributed. The analysis showed that there might be a limited number of schemes for which it would make a sizeable difference,

²⁸ Described as “the risk associated with the nature of a scheme’s investments when compared to the make up of its liabilities” (s.175(3)(a) of the Pensions Act 2004).

at least in percentage terms, but that for many schemes any reduction in levy would be more than cancelled out by the costs of implementation since:

- relatively few schemes had investment strategies that diverged significantly from the ‘average’
- the adjustment to the levy is relatively small for schemes that are underfunded, or schemes that have strong sponsoring employers; and
- where the adjustment is a significant proportion of the levy, such as for schemes close to 100 per cent funded, the levy itself is relatively small.

5.2.5. Additional concerns to the relatively small impact that the inclusion of an investment risk factor would have were:

- the contrast between a potentially complex approach to investment risk and an intentionally simple approach to the main risk factors looked a poor fit with the previous levy formula; and
- the difficulty of reconciling simplicity with accuracy (the most accurate measures are complex), both for reasons of fairness and to avoid the creation of incentives for perverse behaviour.

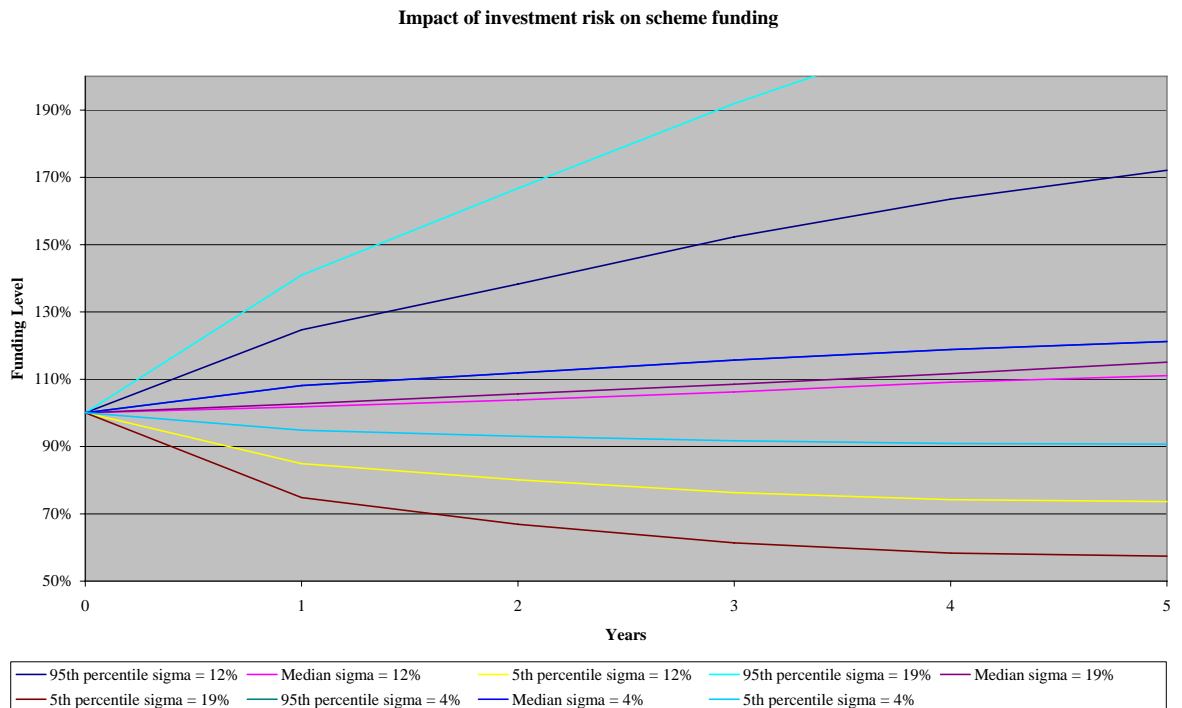
5.3. What has changed?

5.3.1. Investment risk has a significantly greater impact over a longer period and under conditions where claims on the PPF are high. The new long-term risk component to the risk-based levy looks precisely at these scenarios, when deficits are likely to be at their greatest. It is therefore an appropriate time to revisit the question of the inclusion of investment risk in the levy formula.

5.3.2. Based on the latest available data, we estimate that just over 10 per cent of the levy would be redistributed by the new formula. This is just over three times the influence KPMG found for the old formula. The real significance of investment risk will depend on the balance of the expected risk and unexpected risk terms in the levy formula at a given point in time. Improvements to the data collected in the scheme return will also play a part.

5.3.3. Chart 8 illustrates how the impact of investment risk on scheme funding becomes more significant over a period – showing for a scheme that is initially 100 per cent funded the range of levels of funding over a one year to five year period for different levels of investment risk. All portfolios show more volatility over five years than one year, with the highest risk portfolio showing the greatest volatility, as would be expected.

Chart 8: Impact of investment risk on scheme funding over five years



5.3.4. As well as the increasing prominence of investment risk in the formula, there have been changes in the external environment:

- Scheme funding has been volatile; initially rising, before declining to below the levels on which the 2006 study was based;
- PPF and other surveys suggest that the trend to diversification of assets and the development of liability driven investment has continued, but with schemes pursuing these approaches at different rates;
- There is increasing evidence of an appetite in the industry for account to be taken of investment risk in setting the levy; while there was strong support for not including investment risk when we consulted two years ago, a recent panel survey for Professional Pensions showed a majority of respondents were in favour of taking account of hedging in calculating the levy.²⁹

5.3.5. In addition, the Board now has better information on the dispersion of risk between schemes. This suggests that there is a group of schemes that have investment risk that is markedly below that of the average scheme, for example due to the use of insurance assets for pensioner members and other low risk assets in respect of members yet to retire. Recognising this in the levy formula would result in a more accurate risk-based levy for these schemes.

²⁹ Professional Pensions 24 April 2008. When asked “should the PPF take hedging strategies into account in risk-based levy calculations” 56 per cent said yes, 27 per cent no and 17 per cent did not know.

5.4. Market impact of including investment risk

- 5.4.1. The Board proposes to introduce an investment risk factor into the levy formula in order to better reflect the risks that it faces in relation to scheme's future funding. In doing so, the intention is not to offer an opinion on what is the most appropriate investment strategy for a scheme to pursue, which in the Board's view is a matter for the trustees of each scheme.
- 5.4.2. The Board has given consideration to the potential impact on markets of introducing investment risk to the levy formula, recognising that there is already a gradual movement from return-seeking to matched assets. A fuller analysis is included in Annex E but in summary the Board considers that the incremental increase in levy for schemes with return-seeking assets is very small in relation to the additional return expected from those assets.
- 5.4.3. Our impact analysis shows that the impact of including investment risk is likely to be insufficient to change behaviour, which will represent a more holistic view of the returns of different asset classes, the maturity of the scheme and sponsor covenant. For that reason the Board considers that introducing an investment risk factor is unlikely to significantly affect behaviour. It will, however, mean a fairer levy distribution.

Q 5: Do you agree that taking account of investment risk in the levy is unlikely in itself to alter the behaviour of schemes or impact markets?

5.5. How to take account of scheme-specific investment risk?

5.5.1. The Board has considered a range of approaches to include scheme investment risk in the new levy formula.

Option 1: No differentiation by scheme

5.5.2. It would be possible to use information on aggregate asset allocation as a basis for common discount factors on scheme assets to account for short and long-term uncertainty in the size of scheme deficits. In this case the discounts for short term underfunding (U) would be 10 per cent, and for long-term underfunding (V) would be 40 per cent.

5.5.3. As with the current formula this approach does not take into account any scheme specific information and does not reflect schemes' de-risking, which would only be recognised if it was carried out by the majority of large schemes, leading to a change in the parameters for the common scaling factor.

5.5.4. The approach would also require adjustment because the aggregate asset allocation would change over time as schemes mature, effect buy outs, change investment strategies, etc.

Option 2: Certification of low risk investments

5.5.5. A potential refinement on the use of an aggregate scaling factor for assets is to allow schemes that have lower exposure to investment risk to submit a voluntary certificate demonstrating that they met one of a set of criteria that qualified them as "low risk". Schemes that submit an accepted certificate would have a reduced discount factor applied to the value of their assets) than schemes that do not submit a certificate. Schemes that do not submit a certificate would be classified as "standard" investment risk. There may be one or more low risk categories of schemes.

5.5.6. This is a relatively simple system that would allow some level of differentiation between schemes' investment risk and allow schemes which have significantly lower risk to have a reduction in their levy accordingly. Possible risk mitigating actions by schemes would also be taken into account.

5.5.7. There are a number of potential definitions of low investment risk which include:

- Schemes that have a significant portion (greater than 90 per cent) of their liabilities backed by trustee-owned annuities;
- Schemes that have a significant portion of non growth assets (greater than 90 per cent where growth assets include equities and property).

5.5.8. While this approach has the advantage of being simple and allows schemes to demonstrate they have reduced investment risk even with limited resources, the Board has recognised that it has a number of disadvantages:

- It significantly reduces the extent to which the formula takes account of scheme investment risk;
- It creates “cliff edges” where a slight increase in investment risk could lead to a significant increase in levy;
- Selection bias means that the average discount for standard risk schemes would need to be increased (i.e. the discount would need to exceed the 10 per cent and 40 per cent levels identified above);
- It is unfair to schemes that are low risk but unable to certify that they are owing to other considerations (for example those that use derivatives to reduce risk or intend to change their asset allocation); and
- Some schemes may find it difficult to provide the additional information necessary for classification even though they are low risk.

5.5.9. For these reasons the Board considers this approach unlikely to be the best that can be achieved even in the short-term.

Option 3: Use scheme returns for all schemes

5.5.10. Information about the proportion of assets held in different asset classes is already gathered from schemes through Exchange. This information is already used in calculating a scheme’s levy, as it forms part of the methodology used to roll asset values forwards or backwards to the date used in the levy calculation, 31 March 2010 for 2011/12. Together with the liability data such as the proportions of active, deferred and pensioner members collected through Exchange, this information can be used to estimate the volatility of a scheme’s funding ratio and allow for scheme-specific investment risk.

5.5.11. Option 3 has the benefit of using information available as a result of data already collected through Exchange. It potentially avoids selection bias as it would be applicable to all schemes and it improves the fairness of the levy.

5.5.12. However, there are a number of challenges with using this method to assess scheme investment risk:

- It does not capture more sophisticated risk reduction techniques employed by schemes. For example, schemes’ derivative hedging of equities and interest rates is not captured, and their dynamic asset allocation strategies are not reflected;
- The treatment of asset and liability matching is relatively unsophisticated as the full interest rate duration effects between assets and liabilities on a scheme-specific basis are not captured (the PPF can estimate liabilities

on a scheme-specific basis – and proposes to use the categories of member to do this. In principle we could go further and use the average age information supplied through Exchange, but this would not significantly improve results since there is no information given on asset durations);

- In theory it is possible to “game” the levy calculation through the use of “bed and breakfasting” where the scheme changes the asset allocation on the date that the data is due (or calculated). Initial feedback, however, suggests that such activity is unlikely given the wider responsibilities of pension scheme trustees;
 - It is difficult to determine the appropriate investment risk level for some asset classes. Work to clarify what data is required in Exchange should help relieve this problem, helping schemes to better complete their returns according to the underlying investments;
 - There is a range of investment risk levels within each of the asset categories. For example, corporate fixed interest range from investment grade to high yield with significant differences in their levels of risk.
- 5.5.13. A number of the challenges could be addressed by extending the data requirements under the scheme return, for example by requiring schemes to provide information on the duration of their assets and liabilities. However, extending the scheme return will make it more difficult to complete and the additional complexity of recognising the differences in the formula may not provide sufficient justification for changing. The Board considers the best solution may be offered by moving in time to Option 5 below, which allows for schemes to measure their investment risk.
- 5.5.14. While a measure based on information contained in the scheme return will necessarily be less than perfect, being able to take some account of the investment risk on a scheme level will increase the fairness of the formula.
- 5.5.15. The Board prefers this approach for including investment risk in the levy formula, although a more sophisticated approach for some schemes may be implemented in the future.

Option 4: Voluntary certificate using simple stress tests

- 5.5.16. This option would involve allowing schemes to submit a voluntary certificate signed off by the scheme actuary with results from stress tests on their assets and liabilities. The results of these stress tests would be used in the calculation of the scheme-specific investment risk factor for those assets when using the method discussed in Option 3. In other words, a scheme-specific equity volatility would be substituted for the standard equity volatility when calculating the scheme-specific investment risk. Schemes that do not submit information on their stress test results would have their investment risk factor calculated as per Option 3 for all of their asset classes.

- 5.5.17. The stress tests could involve, for example, submitting results for a 10 per cent increase and decrease in the scheme's equity and property assets. This would allow schemes with high equity/property components to demonstrate a lower level of investment risk than simply using their asset mix.
- 5.5.18. For example, if a scheme has financial derivatives in place that limit the loss on their equity portfolio, then the stress test would provide a lower variance for their equity component which would reduce their investment risk factor.
- 5.5.19. While this would allow for schemes to demonstrate a lower level of investment risk, there are a number of considerations:
1. Does a simple stress test on equity/property assets sufficiently recognise different levels of investment risk between schemes? Schemes use a variety of risk reduction techniques and the simple stress test would only recognise a portion of these. For example, interest rate hedges and dynamic asset allocation would not be recognised.
 2. How should the simple stress tests be calibrated? The stress tests should allow the results to be comparable with those of the standard calculation for the results to be used as part of the investment risk calculation. However, they should allow the scheme to demonstrate a lower level of investment risk.
 3. How should selection bias be allowed for? As the submission would be voluntary, schemes would only provide results if it reduced their levy.
 4. What guidance would be required for the stress tests? For example, there would need to be guidance on how the financial derivatives would be valued.
- 5.5.20. This is a possible short-term solution as it allows some risk reduction to be recognised. However the simplicity of the stress tests may not be sufficient to allow schemes to demonstrate the full range of risk reduction techniques that are used. And it would require a judgement on the extent to which selection bias might lead to under-collection.

Option 5: Internal models approach

- 5.5.21. Under Option 5, schemes could be allowed (or required) to submit the results of work done by schemes or their investment advisers to model the sensitivity of their investment portfolios to changes in risk factors. These could take into account scheme hedging strategies, derivative positions or other actions that mitigate risk to the PPF.
- 5.5.22. These results could be submitted in the form of a certificate which would require sign-off, or through the use of the scheme return. As an initial working assumption, it is suggested that the scheme actuaries are the most

appropriate to sign off the certification taking advice from the scheme's consultants and/or investment managers into account.

- 5.5.23. This is the most complex and time consuming to implement for both schemes and the PPF, as it requires schemes to develop models, and additional guidance to be provided by PPF on the calculations. We would want to work with schemes to understand the implications in more detail.
- 5.5.24. It would not be feasible to make the internal models results compulsory for all schemes due to the potential costs involved with developing the models. Schemes that do not submit results would have their scheme-specific investment risk calculated according to Option 3.
- 5.5.25. When moving to an internal models approach, there are a number of considerations that need to be addressed. These include:
1. Whether the submission of results on an internal models basis should be compulsory for the largest schemes? If it is voluntary, then the PPF would be subject to selection by the schemes, with schemes only submitting results that give them a lower levy. If it is compulsory, then schemes would potentially have costs associated with implementing an internal models approach (or higher fees being paid to their investment advisers). Preliminary feedback has indicated that most large schemes, which contribute significantly to the PPF overall investment risk, are already considering these types of results as part of their investment strategy discussions.
 2. If an internal models approach is compulsory for the largest schemes, should it be available on a voluntary basis for smaller schemes and, if so, what threshold should be applied?
 3. How should the size of economic stresses be determined? Should the shocks be prescribed by the PPF (for example one per cent upwards and downwards shift in interest rates or a one in 40 year change in the yield curve) or should the shocks be left to the scheme to determine?
 4. What risk types should be included? There are a wide variety of asset risks that could be taken into account when looking at investment risk. In particular, changes in equity and property markets and changes in the nominal and real interest rates have significant effects on the level of scheme underfunding. These could be captured in any internal models. However, there are other risks that could have a significant impact, including changes in credit risk, which is particularly important if schemes invest in corporate bonds, and currency risk if schemes invest a portion of their assets in overseas markets.
 5. What guidance is needed for asset/liability valuation? In order for the internal model results between schemes, and between schemes that submit results and those that use the standard calculation, to be consistent, some level of standardisation would be necessary.

6. There is likely to be a range of other questions to answer, though the Board's initial view is that none are likely to be insurmountable.

5.5.26. The Board considers this approach to be a possible solution, particularly in the longer-term. However, the issues set out above would need to be considered before an internal models approach can be adopted. Chapter 6 sets out a potential timeline for resolving these.

The Board's proposed approach

5.5.27. In introducing an investment risk element into the levy formula, the Board's intention is not to direct or influence scheme investment strategies, but simply to reflect the effect that different investment strategies have on potential scheme funding levels and therefore on the level of risk schemes represent to the PPF. Of the possible approaches identified above, Option 3, using scheme returns, makes the best use of information currently provided to calculate a measure of investment risk specific to each scheme, avoiding many of the issues of selection bias. The Board therefore favours this option in the short term.

5.5.28. In the future the more complex approach of Option 5, the use of internal models, may be suitable, particularly for the largest schemes with the most sophisticated investment strategies. As these schemes appear to be considering the results of internal models in their investment decisions, it might be desirable to make this approach compulsory for them so that the PPF can calculate their levies fairly and accurately. However, the costs involved mean that it might not be a feasible option for smaller schemes. The Board therefore sees this option as a potentially attractive solution in the longer term, particularly for large schemes, subject to sufficient interest from stakeholders.

Q 6: Do you agree with Option 3, the proposal to use asset and liability information currently obtained through the Exchange scheme return to calculate a scheme- specific volatility measure that would be incorporated in the new risk-based levy formula?

Q 7: Do you think that, if Option 3 is implemented, behaviour that seeks to reduce the levy charged, rather than genuinely reducing risk, would have a material impact on levy collections? (For example by altering investment strategy immediately after a reporting date or using derivatives to increase risk.)

Q 8: Do you agree that, in the longer term, Option 5, the approach which is based on schemes modelling their own investment risk, should be introduced, at least for larger schemes?

Q 9: If so, should this be compulsory for the largest schemes?

Q 10: If so, what threshold should apply?

Q 11: Should an internal models approach be offered to smaller schemes if they wish to use it?

Q 12: What questions about the approach do you consider would need to be resolved before Option 5 could be introduced?

Chapter 6: The impact on fairness, stability and distribution

6.1. Assessing the fairness of a levy formula

- 6.1.1. The Board considers that a fair levy is one where the levy charged to each scheme is proportional to the level of risk that the scheme poses to the PPF. As explained in Chapter 3, the PPF uses a combined risk measure, reflecting expected and unexpected risk. Fairness can therefore be measured by comparing the share of the levy a scheme pays to the proportion of our combined risk measure it represents.
- 6.1.2. For any scheme, its contribution to our risk is measured by the sum of its expected claims and its contribution to unexpected claims multiplied by the weighting for unexpected risk. These are estimated using the long-term risk model (see Annex B for detail). These estimates are then used to design a formula balancing simplicity and fairness.
- 6.1.3. The degree of fairness provided by a levy formula can be assessed by plotting its Lorenz curve and measuring how close it is to the perfectly fair position with the Gini coefficient (see Box 4 below for background on these).

Box 4: Measuring equality of distribution: The Lorenz curve and the Gini coefficient

Lorenz curves, and their related Gini coefficients, were developed to measure inequalities in income or wealth distribution – though they have additional uses in financial services. The following explanation of their functioning is taken from ONS:

Based on a ranking of households in order of ascending income, the Lorenz curve is a plot of the cumulative share of household income against the cumulative share of households. The curve will lie somewhere between two extremes. Complete equality, where income is shared equally among all households, results in a Lorenz curve represented by a straight line (Diagram B). The opposite extreme, complete inequality, where only one household has all the income and the rest have none, is represented by a Lorenz curve which comprises the horizontal axis and the right-hand vertical axis.

The Gini coefficient is the area between the Lorenz curve of the income distribution and the diagonal line of complete equality (the shaded area in Diagram A), expressed as a proportion of the triangular area between the curves of complete equality and inequality. It can be seen that complete equality would result in a Gini coefficient of zero, and complete inequality, a Gini coefficient of 100.¹

Diagram A

Lorenz curve for a typical income distribution

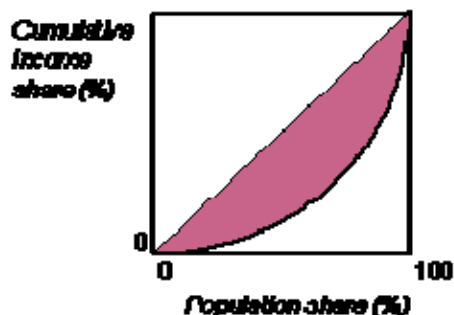
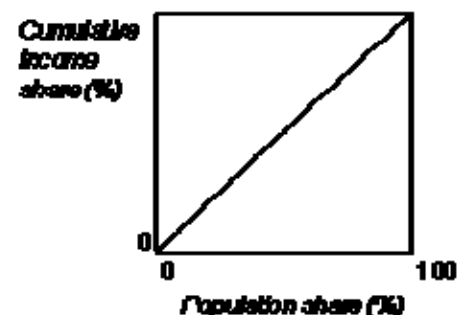


Diagram B

Complete income equality



In recent years, Gini coefficients have also been used in financial services – e.g. to assess the effectiveness of models predicting company insolvency or to measure concentration of risk exposures.

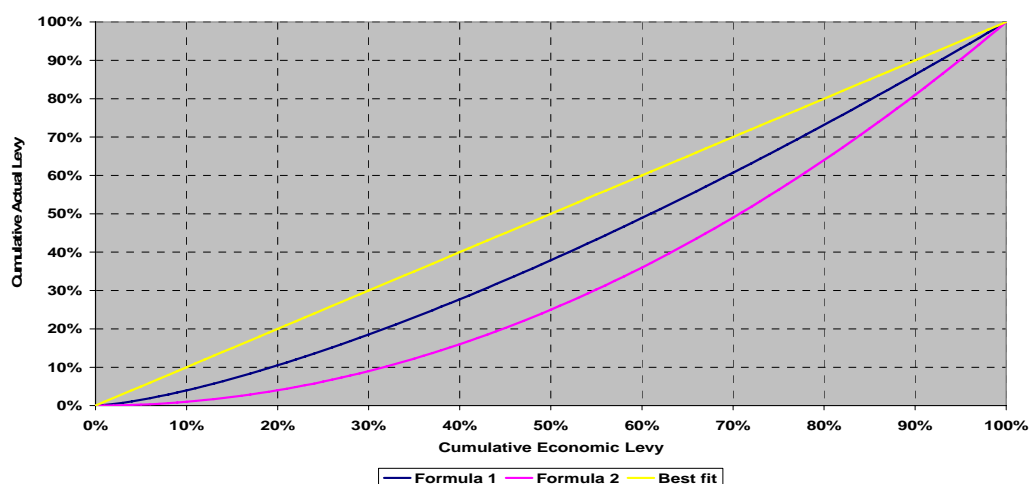
¹ http://www.statistics.gov.uk/about/methodology_by_theme/gini/default.asp

- 6.1.4. The graph below shows Lorenz curves for two (purely illustrative) levy formulae. The horizontal axis measures the cumulative proportion of risk (as measured by the combined risk) and the vertical axis measures the corresponding cumulative levy that is actually paid. For example, these curves show that although some schemes pose 20 per cent of the combined

risk to the PPF, they only pay 10.5 per cent of the levy under formula 1 and 4 per cent under formula 2.

- 6.1.5. Ideally all schemes should pay in exact proportion to their contribution to the combined risk; the yellow line shows this perfectly fair allocation. The degree of fairness of a formula can be measured by the Gini coefficient and measures the proportion of levy that is reallocated. In this example, the Gini coefficient for formula 1 is 17 per cent and for formula 2, 33 per cent. We can conclude that formula 1 leads to a much fairer distribution of the levy than formula 2.

Chart 9: Examples of Lorenz curves of varying goodness of fit



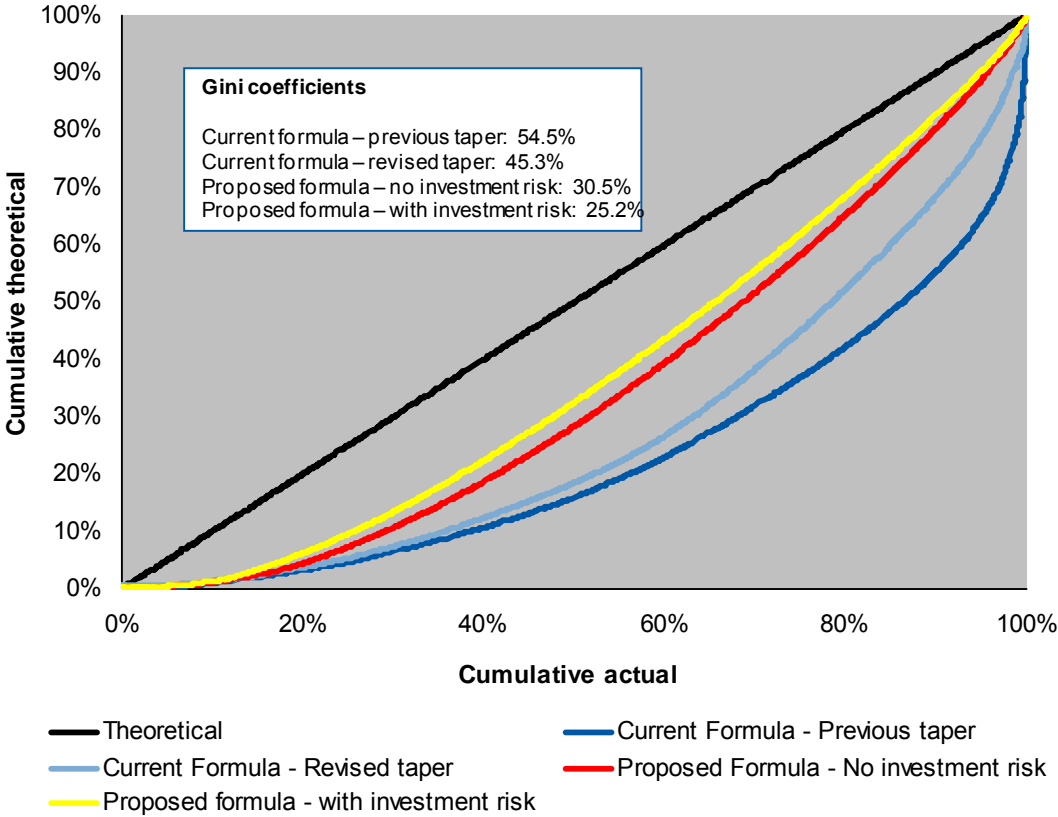
- 6.1.6. It is not possible to achieve a distribution of the levy that perfectly matches the PPF’s assessment of schemes’ risk unless the economic levy is used directly for charging. No simple formula could match the exact distribution that the long-term risk model predicts for the distribution of risks, since it uses complex modelling to generate an interaction between risks. Using more complex approaches than are proposed later in this chapter, such as the use of non-linear functions, or the addition of extra factors such as the size of the pension scheme, would provide a closer fit, but at considerable cost in terms of intelligibility of the levy, running counter to the principle of simplicity.

Q 13: Do you agree with the PPF’s preferred approach to measuring the fairness of the levy?

- 6.1.7. In Chart 10, we show the theoretical fairness of the current levy formula and of the proposed new formula. The closer the corresponding curve is to the straight line, the more accurately the levy allocation approximates the ‘fair allocation’. As Chart 10 shows, the changes to the taper in the 2007/08 levy improved fairness, and the proposed new levy improves it further, particularly when investment risk is taken into account.

6.1.8. It is worth noting that, while the inclusion of investment risk appears to make a relatively small incremental improvement in fairness, this is likely to reflect the current limitations in the data we currently receive through scheme returns. As more accurate information becomes available, the impact of taking account of that information will increase. For example, the scheme return information that the PPF will use for the 2010/11 levy year will be submitted to the Regulator between November 2008 and 31 March 2009 and will provide significantly better data, so increasing the impact of taking account of investment risk. The potential reflection of internal models in our analysis would further increase the impact of investment risk

Chart 10: Lorenz curve showing risk-based components of proposed and current formulae



6.1.9. The Gini coefficients can be interpreted as how far away the distribution is from one which perfectly matches the PPF’s risk. For a £675 million levy, a Gini coefficient of 54.5 per cent implies £368 million is imperfectly allocated. Table 2 shows how far the various formulae are in cash terms from the perfect distribution.

Table 1: Gini coefficients and cash distances from perfect distribution

Formula	Gini coefficient	Distance from perfect levy
Current formula 2007/08 taper	54.5%	£ 368m
Current formula 2008/09 taper	45.3%	£ 306m
New formula – no investment risk	30.5%	£ 206m
New formula – with investment risk	25.2%	£ 170m

6.1.10. The chart shows the fairness of the distribution has improved further. In comparison to the existing formula, the proposed formula including investment risk would mean that the distribution of the levy was £135 million closer to complete fairness.³⁰

6.2. Improving levy stability

6.2.1 Stakeholders have indicated that they would like to see a reduction in the yearly variations in individual bills that make long-term planning difficult. Two factors have led to this variability:

- Changes in the risk posed by individual schemes and the sensitivity of bills to small changes in risk in some cases;
- Changes in aggregate risk across schemes. Given the need to raise a stable levy, changes in overall risk have caused the levy scaling factor to vary between different years. The result is that if a scheme experiences no change in its risk, but other schemes do, it can still see a change in its levy.

6.2.2 In assessing the new levy formula we have tested whether it has the potential to contribute to reducing the volatility of scaling factors and the impact of individual changes in scheme risk over time. The new distribution formula is expected to be less sensitive to changes in insolvency risk than the current formula, as the long-term insolvency risk factor has a narrower range of values than the short-term one. It is also generally less sensitive to changes in funding than the current formula except where schemes are very well funded.

6.2.3 This can best be seen by considering how much the levy quantum would vary were the PPF to fix the parameters of the levy in a situation where aggregate scheme funding or insolvency probability shifts. For 2009/10, for example, the fall in aggregate funding between October 2007 and March 2008 meant that the PPF could expect to collect the same levy (plus indexation) with a scaling factor of 2.22 as previously had been collected

³⁰ As explained above, no formula can generate a distribution of charges that perfectly matches the economic levy. However, a Gini coefficient of 45 per cent implies £305m of £675m is imperfectly allocated, whereas a coefficient of 25 per cent implies only £170m is imperfectly allocated.

with a levy scaling factor of 3.77.³¹ Continuing to use the previous year's scaling factor would have raised over £1 billion, inconsistent with the objective of a stable levy and indeed the legal framework.

- 6.2.4 Table 2 considers, for the existing and new formulae, how much the levy collected would change if the parameters were fixed and there was a 10 per cent decrease in insolvency scores or a 10 per cent increase in aggregate scheme assets. It can readily be seen that less adjustment would be needed to the levy parameters c and w than to the existing levy scaling factor. Individual bills should thus vary less year-to-year.

³¹ See the 2009/10 Levy Consultation published on 23 September 2008.

Table 2: Stability of the quantum under the current and new levy formulae

Year	Change	£m Levy collection under current levy formula	Current formula %Change	£m Levy collection under new levy formula	New formula % Change
2008/09	Original case	675		675	
2008/09	10% decrease in P	629	-7%	646	-4%
2008/09	10% increase in assets	489	-28%	567	-16%

6.2.5 Note that the fact that the new formula is less sensitive to changes in funding and insolvency risk cannot of itself guarantee that an individual scheme's levy will be more stable in the future than it has been to date. Periods of significant volatility in scheme funding levels are bound to result in levies that are volatile. However, the new formula should help relative to the degree of volatility that would have been experienced with the old formula, at least for the majority of schemes.

6.2.6 From the point of view of an individual scheme, it is also useful to understand how changes in its risk will alter the levy bill (assuming stable overall scaling factors). Table 3 shows how an increase in insolvency risk affects a typical individual levy.³² A similar effect is seen in Table 4, which shows the proportional change in a scheme's levy resulting from a change to its funding ratio. The movement in a scheme's levy depends on its credit risk and hence comparison is made across examples from three credit rating bands.

Table 3: Changes in levy for typical scheme arising from p score change

Change in P-score	Current Formula	New Formula
0.0001 to 0.0003	200%	106%
0.0015 to 0.0017	13%	8%
0.0037 to 0.0039	5%	4%
0.0098 to 0.0102	4.1%	3.5%

³² Figures calculated on the basis of the parameters used in Annex B and represent a movement upwards of 1 D&B score for D&B scores 100, 90, 75, 50. They assume the scheme is not subject to a cap or the taper and has average investment risk.

Table 4: Decreases in levy arising from funding improvements under levy formulae

Funding Change	Per cent decrease in levy (proportion of original levy)			
	Aa		Baa	
	Current	New	Current	New
70%-75%	-8%	-6%	-10%	-8%
85%-90%	-11%	-8%	-13%	-10%
100%-105%	-16%	-10%	-22%	-14%
115%-120%	-29%	-9%	-66%	-10%
135%-140%	-2%	-14%	-14%	-18%

Charts showing the response of the current and new formulae across a wide range of funding ratios are presented in Annex A.

- 6.2.7 The new levy formula is less sensitive to funding movements for the Aa and Baa ratings. Percentage changes in levy under the new formula are greater only when moving between very high funding ratios (e.g. 135 per cent -140 per cent). It is possible, however, to attribute this to the extreme insensitivity of the current formula at funding levels above 120 per cent. Overall, the new levy formula exhibits a more gradual and consistent response to funding level changes for less risky schemes.
- 6.2.8 In the case of a Caa rating, the levy is capped at one per cent of liabilities for funding below 110 per cent. The new formula remains less sensitive to funding movements at funding ratios above 110 per cent.
- 6.2.9 To date, the PPF has set a levy amount which is fixed, with the result that changes in insolvency and underfunding risks have been compensated for by adjusting the scaling factor. If scheme funding improves or insolvency risk falls, then the scaling factor is adjusted up to achieve the required levy (£675 million in 2008/09).
- 6.2.10 The introduction of a new formula which takes account of long-term risk and is less sensitive to changes in funding levels and insolvency scores, in principle offers the opportunity to look at further measures that could address levy stability. Recognising the interest of stakeholders in this area, the Board may return to it when market conditions make that more appropriate.

6.3 Impact assessment

6.3.1 We have carried out an impact assessment as if the proposed approach had been implemented for 2008/09 – so that the current and proposed formulae can be compared. The main findings are summarised below. A full analysis of the potential impact of the proposed changes is included in Annex A.

6.3.2 To produce this impact assessment we have had to make a range of assumptions about conditions at the time of introduction, the overall levy the PPF would be seeking to collect, and the parameters that would be used.

Key assumptions used include:

- A levy quantum (targeted total collection) of £675 million (as used in 2008/09);
- Scheme-based levy set at 10 per cent of the quantum;
- Scheme information (including DRCs, contingent assets, p scores, investment allocations and membership size, but excluding assets and liabilities,) taken as at March 2008;
- Funding information taken as at October 2007; and
- The rate for short-term risk set at the level of expected claims in the LTRM run at March 2008 of £135 million. Note that, as set out in 4.2.27, the Board will not necessarily always choose to recover expected claims each year, as these are volatile.

6.3.3 Any analysis is subject to limitations. In particular, for this analysis, we have been unable to identify annuities held by schemes (particularly prevalent amongst small schemes) in calculating investment risk. Data submitted from this year on will distinguish annuities from insurance assets (such as pooled funds). Lacking that information we have not been able to reflect the extent to which these assets – matching the liabilities as they do – will reduce scheme investment risk. Whilst overall this has limited impact, it will mean that we may be overestimating the investment risk of a significant number of smaller schemes, and therefore their levies. This could mean our estimate that 50.5 per cent of schemes would gain under the new formula may understate the true position.

6.3.4 It is important to be aware that the parameters used to generate the impact analysis below (and in Annex A) will be subject to change before the proposed introduction of the new formula in 2011/12. By the same token, if the existing formula were still in use in 2011/12, that would operate using a levy scaling factor the value of which is highly uncertain, so that the distribution of the levy using the existing formula cannot be estimated. The final parameters for 2011/12 will be published in the levy determination for 2011/12.

- 6.3.5 The distributional effects of the envisaged changes to our levy are complex as the impact on any scheme is a combination of a number of elements. Other things being equal:
- Schemes with low short-term risk tend to pay more than they used to. Their levy remains lower than for schemes with high short-term risk – but the disparity is reduced, more accurately reflecting the difference in risk posed;
 - Schemes with low investment risk pay less;
 - In the modelling we have done, all schemes are charged a reduced scheme-based levy (the element of the levy not based on risk) – which shifts burdens away from large schemes.

In practice each scheme is affected by all three of these influences, so that the interplay of all three determines whether the levy is higher or lower.

- 6.3.6 To illustrate this, Box 5 shows a number of examples demonstrating characteristics of schemes that gain or lose from the new formula – and shows the impact of a formula that uses a non-scheme-specific approach to taking account of investment risk (i.e. which discounts all schemes as if they had average investment risk). Each scheme's levy has been split into the three levy components, showing the relative contribution of each to the overall change in their levy.
- 6.3.7 Half of schemes have a lower levy if the new formula is used, with a further 17 per cent paying a bill up to 25 per cent higher. Thirty-three per cent of schemes face more significant increases, with a small number (eleven per cent) seeing a levy that more than doubles: the impact analysis suggests that in general these are schemes that will still pay a low levy compared to the size of scheme (i.e. as a proportion of liabilities.).
- 6.3.8 Indeed one of the key characteristics of the new formula is that fewer schemes pay either very small or very large levies – seventy per cent of schemes will pay between 0.04 per cent and 0.5 per cent of liabilities, compared with 50 per cent for the existing formula. This makes the levy more affordable for schemes, reducing by more than a third the number of schemes who pay a levy greater than 0.5% of their liabilities.
- 6.3.9 It is striking that, for those that have higher bills under the new formula, the increase in levies is relatively slight as a proportion of scheme liabilities. By comparison, for those benefiting from a lower levy the reduction is dramatic as a proportion of liabilities.

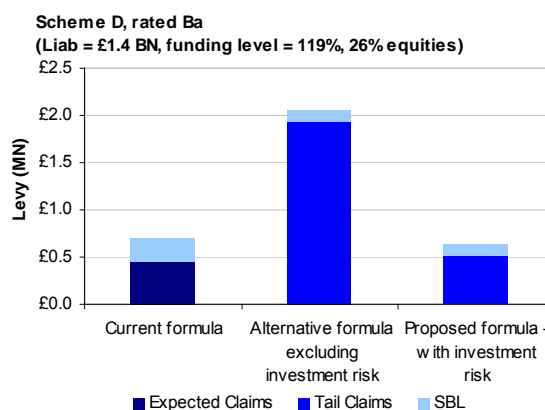
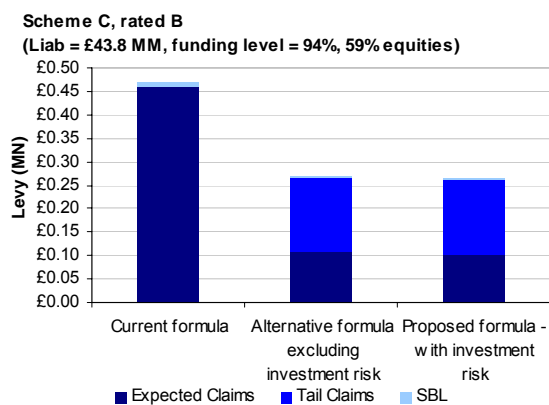
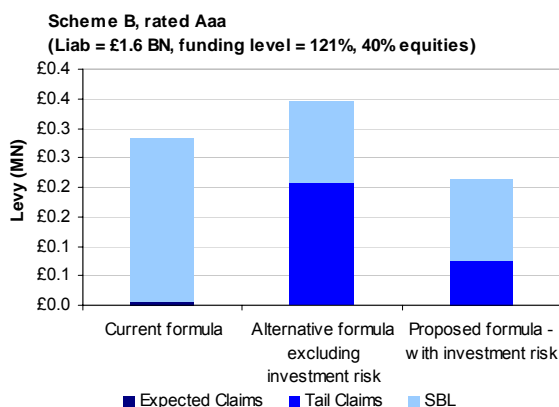
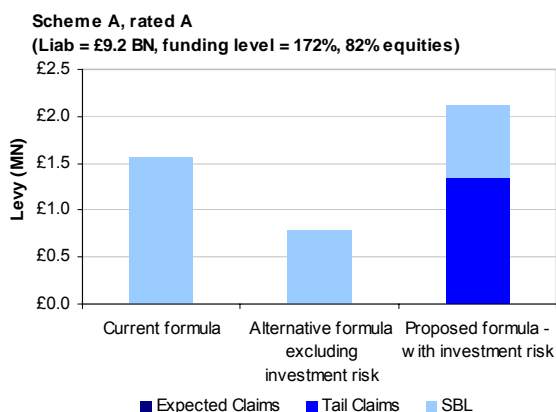
Box 5: Components of total levy for example schemes: current and new formula

Scheme A is an extremely well funded scheme. This scheme only pays a scheme-based levy and it benefits because that is reduced under the proposed formula. In fact, it is noteworthy that its levy would be likely to significantly *decrease* under the new formula excluding investment risk, despite the potentially high risk posed to the PPF in a downturn by its high proportion of equities. However, it faces a higher, and fairer, levy if account is taken of investment risk.

Scheme B will pay a higher levy because, although it currently has a strong sponsor, it makes up a large portion of the PPF unexpected claim. But with a low proportion of equities it will see a lower levy if account is taken of investment risk.

The levy for Scheme C reduces significantly: this scheme has a high one-year default probability and suffered from the application of the scaling factor to short-term risk. But it makes only a limited contribution to long-term risk and so benefits from including the second risk-based component. With average investment risk, it makes no difference whether the formula takes account of scheme-specific investment risk.

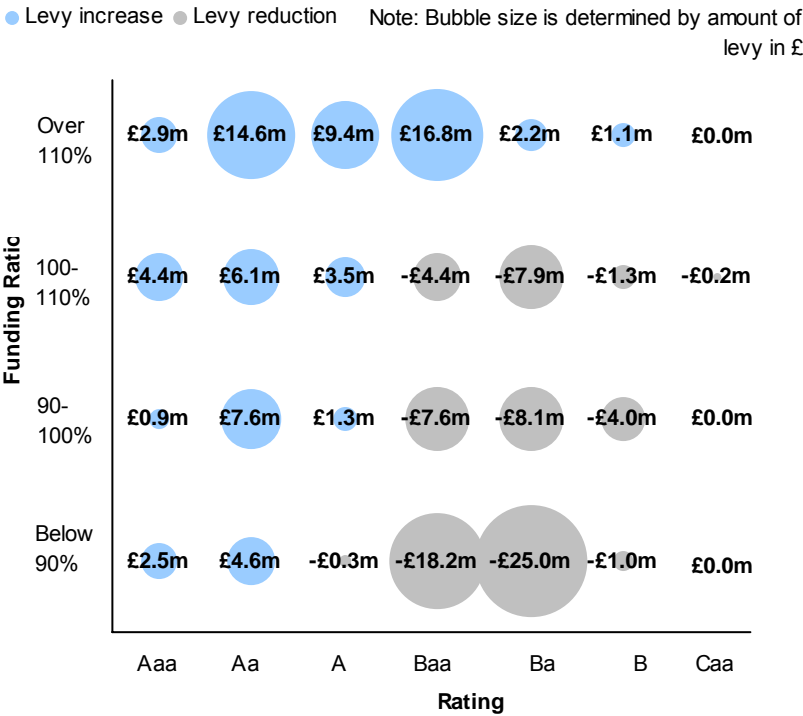
Scheme D has a weak sponsor but is well funded enough to pose little short-term risk to the PPF. The unexpected risk element significantly increases its levy, but a low risk investment strategy means it is unlikely to represent a claim on the PPF. So including investment risk reduces its levy to a level below the current levy. Again, note the high impact of including investment risk in the new levy formula for this scheme.



6.3.10 The distribution of levy by scheme size remains very similar under the proposed formula – once the change to the scheme-based levy is included. By comparison, as would be expected, it will increase the levy to schemes with sponsors that have the best credit ratings, because it takes account of their contribution to unexpected claims.

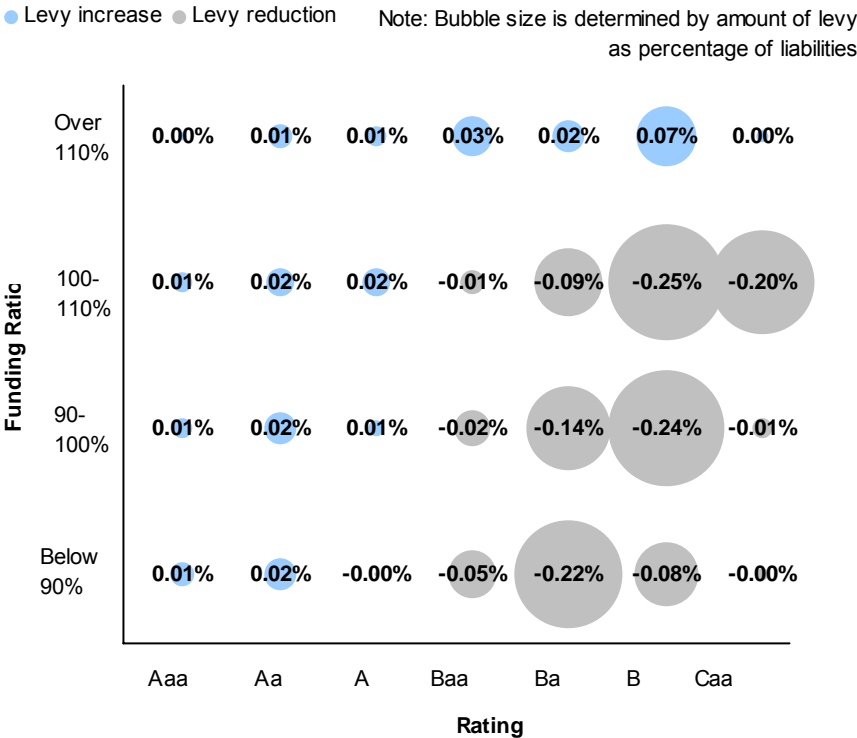
6.3.11 In considering the impacts of the Board’s proposal to move from the current formula to the new formula and take account of investment risk (using Option 3), the following chart shows that schemes with high short-term risk, i.e. those that have lower funding or inferior insolvency scores, tend to benefit from a reduction in their levy. This recognises that, by scaling up their high short-term risk, the current formula has overstated their contribution to unexpected claims. Their levy remains higher than for schemes with low short-term risk – it is just that the disparity is reduced, more accurately reflecting the difference in risk posed.

Figure E: Increase/Decrease in levies by funding ratio and credit rating



6.3.12 Looking at change in levy relative to the liabilities of the scheme (as a measure of size of scheme), it is noticeable that changes are generally small in relation to the scale of the scheme (measured by liabilities) for those schemes that have an increased levy, but the improvement is significant for those schemes that gain. Underfunded schemes with weak employers are likely to be constrained in their ability to make deficit reduction contributions, so a lower levy, as well as being fairer, may help improve funding.

Figure F: Increase/Decrease in levies by funding ratio and credit rating



6.3.13 Another group of schemes that tend to gain are those that have a relatively low investment risk. The following charts, which show changes in the levy for schemes with different investment risk and funding ratios, reveals that schemes with higher investment risk generally pay more. Again it is noticeable that those paying more with the new formula because of high investment risk are typically facing a small increase as a proportion of liabilities (see Figure G below) – which chimes with the conclusion of our analysis of market impacts.

Figure G: Increase/Decrease in levies by funding ratio volatility and credit rating

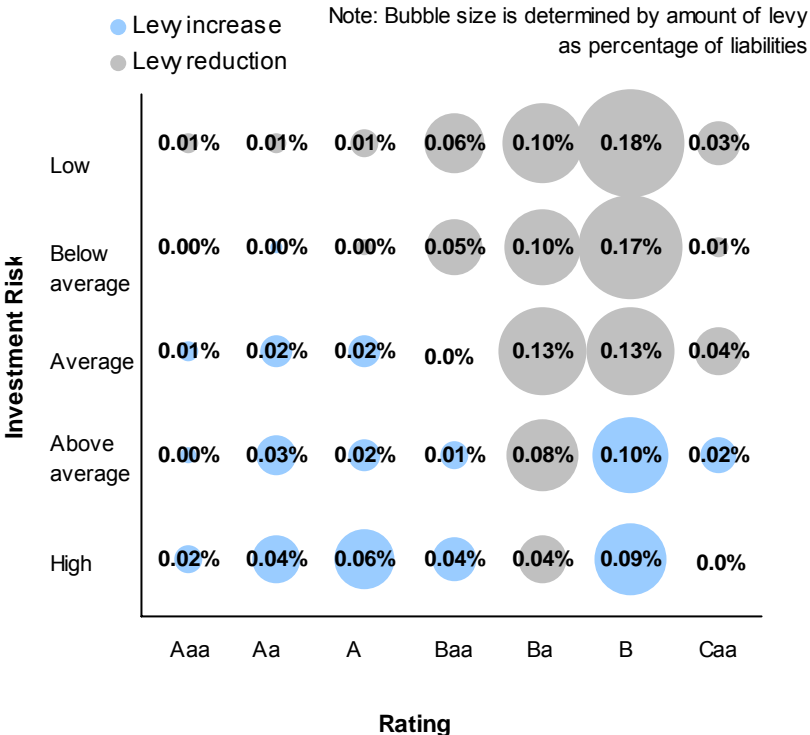
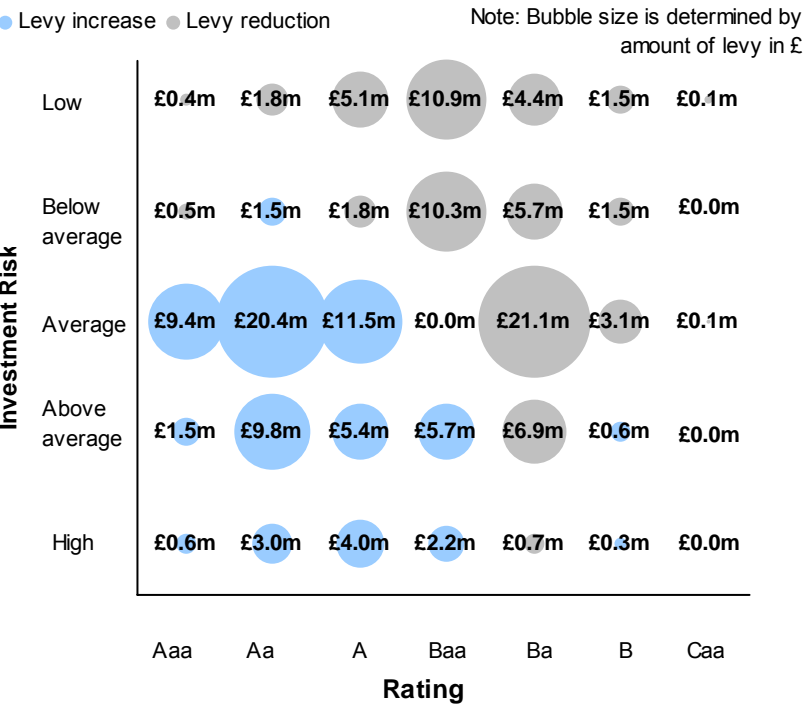


Figure H: Increase/Decrease in levies by funding ratio volatility and credit rating



Chapter 7: Implementation

7.1. Implementing the Board's proposed approach in 2011/12

- 7.1.1. The proposed initial approach can be implemented without requiring further information from schemes, though the significance for schemes of supplying accurate information on asset allocation through Exchange will increase.
- 7.1.2. Schemes may wish to take account of the proposed changes when considering new contingent assets. A decision on proceeding with the Board's proposed approach in late spring next year would mean schemes have a significant amount of time to put in place new contingent assets for 2011/12.
- 7.1.3. The Board's indicative timescale for implementation is:

Consultation open for comments from stakeholders	November 2008 – February 2009
Programme of regional stakeholder meetings	January 2009
PPF policy paper published – sets out Board conclusions following consultation	Late Spring 2009
Scheme data deadline for 2011/12	End March 2010
Consultation on draft levy determination published, including final parameters for 2011/12 levy Development of recommendations for formula parameters and caps, with impact analysis.	Autumn 2010
Final determination for 2011/12 published	Winter 2010
PPF systems updated for new calculation	Autumn – Winter 2010
Invoicing begins	Summer 2011

7.2. Developing a more sophisticated approach to investment risk

7.2.1. Developing a more sophisticated approach to investment risk would require new information to be collected from at least some schemes. This implies time both to determine in detail what the measure will be, and time to develop Exchange to capture the new information required from those schemes. Implementation would therefore be in a later year.

7.2.2. If there is support for development of an internal models approach the Board would adopt an approach similar to that used in developing the new levy formula, with a further consultation in 2009/10, and would wish to involve stakeholders in that process, both informally to help develop a workable approach and formally, through a consultation exercise in 2009.

7.2.3. A potential implementation path would be:

Develop proposition in discussion with industry experts and test proposition with sample of schemes	Summer 2009
Consult on proposed approach	Winter 2009/10
Develop Exchange data capture to allow new information to be collected	Late 2009/ Early 2010
Issue scheme return	Nov 2010
Obtain data from Exchange	March 2011
Charge levy based on internal models data	2012/13 levy year

7.2.4. Implementation earlier would make it hard for schemes to alter investment strategy before being charged a levy on the new basis – since data supplied to Exchange needs to be based on audited annual accounts. This means that data captured in March 2011 is likely to relate to scheme accounting year ends of March/April 2010. Implementing in 2011/12 would imply data relating to accounting year ends of March/April 2009 was used, unless additional accounts were prepared to another date.

Chapter 8: The consultation process

8.1 Responding to the consultation

- 8.1.1 The Board of the Pension Protection Fund welcomes your views on the proposals included in this consultation document.

8.2 Arrangements for written submissions

- 8.2.1 The consultation period begins on 18 November 2008 and will end on 13 February 2009. Please ensure that your response reaches us by that date. If you would like further copies of this document it can be found at the Pension Protection Levy section of the Pension Protection Fund website at www.pensionprotectionfund.org.uk.

- 8.2.2 Please address all hardcopy responses to:

Chris Collins
Head of Levy Policy
Pension Protection Fund
Floor Knollys House
17 Addiscombe Road
Croydon
CR0 6SR

Please e-mail all electronic responses to consultation@ppf.gsi.gov.uk.

- 8.2.3 Please state whether you are responding as an individual or representing the views of an organisation. If you are responding on behalf of an organisation please make it clear who the organisation represents and, where applicable, how the views of members were assembled.
- 8.2.4 The requirements of the Freedom of Information Act (2000) state that all information contained in the response, including personal information, may be subject to publication or disclosure. By providing personal information for the purpose of the public consultation exercise, it is understood that a respondent consents to its disclosure and publication. If this is not the case, the respondent should limit any personal information which is provided, or remove it completely. If a respondent requests that the information given in response to the consultation be kept confidential, this will only be possible if it is consistent with the Freedom of Information Act (2000) obligations and general law on this issue. Queries should be sent to Paul Reynolds. Further information about the Freedom of Information Act 2000 can be found on the website of the Ministry of Justice at: <http://www.justice.gov.uk/guidance/guidancefoi.htm>.

8.3 Publishing a summary of responses

- 8.3.1 The Board will publish a summary of responses, and a statement of the final policy, on the PPF website at www.pensionprotectionfund.org.uk during late spring 2009.
- 8.3.2 This consultation is being conducted in line with the Code of Practice on Consultation. The code can be accessed via the website of the Department for Business, Enterprise & Regulatory Reform (BERR) at: <http://www.berr.gov.uk/files/file44364.pdf>
- 8.3.3 The Board would value any feedback on the effectiveness of this consultation process. If you have any comments then please contact:

Paul Reynolds
Director of Corporate Affairs
Pension Protection Fund
9th Floor Knollys House
17 Addiscombe Road
Croydon
CR0 6SR
Tel: 020 8633 4968

Glossary

c	c is the <i>rate for short-term risk</i> in the levy formula
Combined risk measure	<p>A measure combining the expected and unexpected risk that faces the PPF over a five year period. It therefore provides a single indicator of PPF risk.</p> <p>Also called the economic or theoretical levy in earlier publications (in August 2007 consultation document).</p>
Determination or levy determination	<p>The legal document that contains the rules for calculating the levy in a particular levy year (made under section 175(5) of the Pensions Act 2004).</p> <p>N.b. As rules may differ between years it is important to be precise about which year's determination is referred to.</p>
Economic levy	See <i>Combined risk measure</i> .
Expected claims or expected risk	<p>Our best estimate of future claims, measured with the mean value of claims projected by the long-term risk model.</p> <p>The risk to the PPF, when the number of claims for compensation are at an average level over one year.</p>
Extreme claims	The PPF models extreme claims using the 97.5 th percentile of five-year claims. This means a claim that may be expected to occur once in 40 five-year periods.
Gini coefficient	<p>A test of fairness of distribution.</p> <p>In this document, it measures twice the area between a "perfect" distribution of the levy (defined as one in which every scheme's share of the levy is the same as its share of the combined risk) and the actual distribution as shown on a <i>Lorenz curve</i>. (See below and page 47).</p> <p>The co-efficient can be thought of as the proportion of the levy that would need to be re-allocated for a perfectly fair distribution (e.g. a Gini co-efficient of 0.25 means 25% of the levy would need to be re-allocated for the levies to be exactly</p>

	in proportion to combined risk).
Insolvency risk	The risk that a scheme's sponsoring employer(s) will become insolvent, causing a claim on the PPF for compensation. This is measured as a probability of insolvency. (See <i>p</i> , <i>P</i> , <i>q</i> and <i>Q</i> .)
Investment risk	The risk to the PPF caused by a scheme's investment strategy, which affects its funding level as markets and interest rates move, measured by the standard deviation of the funding ratio.
Levy cap	The percentage of scheme liabilities used as a maximum level of risk-based levy. In 2008/09 & 2009/10 this is one per cent, so no scheme can pay a risk-based levy bill that would be bigger than one per cent of its liabilities.
Levy scaling factor	A factor in the levy formula to 2010/11 which scales up an individual scheme's <i>short-term risk</i> in order to ensure that the PPF collects an amount as close as possible to the <i>levy quantum</i> , which is calculated based on <i>long-term risk</i> .
Lorenz curve	Used in economics as a way of representing equality of distribution graphically, based on the cumulative probability of a certain value. The straight line on the graph shows what equal distribution would look like and the curve on the graph represents the real distribution. The closer the curve runs to the (45 degree) straight line, the fairer the distribution.
LSF	<i>Levy scaling factor</i>
Long-term risk	The potential unexpected claims on the PPF, measured over five years.
Long-term risk component (of the levy)	The component of the risk-based levy that reflects a scheme's contribution to PPF long-term risk (potential unexpected claims on the PPF, measured over five years).
<i>p</i>	Short-term employer probability of insolvency.
<i>P</i>	Short-term scheme <i>insolvency risk</i> , measured as a probability of insolvency Note that, for single employer schemes, <i>p</i> and <i>P</i> are the same. For multi-employer schemes <i>P</i> is a

	weighted average of the short-term probability of insolvency (p) of all employers. (see 4.2.31)
q	Long-term employer probability of insolvency. Calculated by translating short-term employer probability of insolvency (p) – using table in Annex B (table 8)
Q	Long-term insolvency risk, measured as a probability of insolvency. For a single employer scheme Q is imply the same as q. For a multi-employer scheme Q is a weighted average of the long-term probability of insolvency (q) of all employers. (see 4.2.31)
Rate for short-term risk (c)	A scaling factor applied to the short-term risk component of the levy to ensure that it collects an appropriate level of levy.
Rate for long-term risk (w)	A scaling factor that scales down the long-term risk component of the levy to ensure that it collects an appropriate level of levy.
Short-term risk	Expected claims on the PPF over one year.
Short-term risk component (of the levy)	The component of the risk-based levy that reflects a scheme's contribution to PPF short-term risk (expected claims on the PPF, measured over one year)
σ (sigma)	The <i>investment risk</i> measure (i.e the standard deviation) used in the funding ratio. This is used in calculating a scheme's underfunding risk.
Taper or levy taper	The stepped series of funding levels at which a scheme's <i>underfunding risk</i> is calculated as a fixed percentage of liabilities in its levy invoice calculation.
U	Short-term <i>underfunding risk</i> in the levy formula
Underfunding risk	The risk that a scheme will require compensation if it makes a claim on the PPF and how much this will be. This is measured using scheme section 179 valuations, which are broadly based on the cost of buying out benefits at PPF levels of compensation.

Unexpected claims	An above-average level of claims for compensation from the PPF. It's the difference between the worst case scenario and the expected one.
Unexpected risk	The risk to the PPF during adverse economic scenarios.

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