This paper summarises our research into the world of low risk pension scheme management. In recent years, many people have talked about pension schemes becoming self-sufficient but we have found this phrase to be undefined and covering a wide range of potential risk scenarios. We look instead at a future world of ‘Pensions Stability’ – a world in which risk will usually be significantly lower than today for both trustees (in terms of paying benefits to members) and for sponsors (in terms of not having to pay further or unexpected contributions).

A purist interpretation of self-sufficiency would look at a pension system which is well financed and invested in a low risk fashion with minimal reliance placed on the sponsoring employer to pay further contributions. In order to protect against the downside risk of falling into deficit and requiring additional contributions from the sponsor, we need to hold a funding buffer in the scheme. However, this quickly becomes inefficient and, by holding this additional buffer, the scheme veers to surplus in many potential future outcomes, which may then be difficult to recover from the scheme. The amount needed to cover the downside risk can also bring the total funding target up towards the cost of buy-out itself, making this an unattractive target for sponsors.

In addition, our research shows that, even for schemes which are run in this way, a stable funding position is a difficult state of affairs to maintain over time – small variations can magnify themselves over a 20 year time frame, even for a scheme which is 100% funded and invested wholly in government bonds. Our analysis shows that in only a few cases does a self-sufficient system actually remain stable – instead, it either becomes very underfunded or very overfunded.

Moving away from the purist interpretation of self-sufficiency, we examine solutions that may represent a more realistic balance between the needs of sponsors, trustees and members – solutions which can be grouped under the ‘Pensions Stability’ heading. For example, they could involve accepting a higher likelihood of further contributions being required from the sponsoring employer.

When looking at Pensions Stability solutions, we also consider a further variation – rather than holding all of the assets in the scheme (which sponsors may find unattractive because they cannot participate in any upside), an alternative would be to hold the basic funding target in the scheme and the additional buffer outside the scheme in a format such as an escrow account, where the sponsoring employer can receive reward in favourable outcomes. For schemes with DC sections in the same trust, a related approach would involve using scheme surplus to meet sponsoring employer DC contributions.

Many schemes will also have a longer term objective of reaching the position where they can buy out their benefits with an insurance company and so they will want to factor into their thinking the likelihood of being able to meet this objective.

Our analysis focuses on identifying financing strategies – assets held in the scheme itself and also as separate buffers or policies outside the scheme – that offer a cost significantly less than buy-out and which adequately balance the needs of trustees and sponsors. Such strategies may involve running a higher level of investment risk in the scheme than for a self-sufficiency strategy but can represent a pragmatic outcome for trustees and sponsors. Similar conclusions can also be reached for schemes operating in the public sector and we have included examples of how these principles can be applied to the Local Government Pension Scheme (LGPS).

The issues are complex and some outcomes are counter-intuitive at first sight. But balancing the competing demands of the parties can lead schemes to identify a ‘sweet spot’ which sensibly addresses risk and consequences of bad scenarios, does not excessively tie up corporate assets for pension funding and gives a reasonable chance of getting to a buy-out target in the long term. For example, our modelling for a typical scheme has found a sweet spot centred on overall funding (scheme plus buffer) of the order of 105% to 108% of a ‘gilts + 0.5% p.a.’ funding target, with a corresponding investment policy. Financially, this could be the definition of Pensions Stability that will suit trustees and sponsors alike.
Introduction

The world of defined benefit (DB) pension schemes continues to change. The liabilities of most private sector schemes are now dominated by deferred and current pensioners and have few, if any, active members remaining. Even public sector schemes are starting to show signs of increasing maturity. Over the next few years, an increasing number of private sector schemes will reach the point where they mainly consist of current pensioners.

For many sponsoring employers, their DB scheme is now a ‘legacy’ issue which has become solely the responsibility of the finance department – at best, a distraction and, at worst, a major barrier to the sponsoring employer getting on with its core business;

For many trustees, this leaves an uncertain outlook – even if they currently have a strong sponsoring employer and a good relationship with them, what will this be like in 10, 20 or even 30 years’ time?

And members have an even longer term outlook – most schemes will continue to have beneficiaries for over 70 years and some for much longer than this. Famously, the last widow receiving an American Civil War pension died in 2004, almost 140 years after the war ended and several children who qualified for dependants’ pensions were receiving them even more recently.

In this context, many trustees are beginning to think about their legacy – where is their scheme heading and how is it going to get there? This makes just as much sense from a sponsor perspective – a well-managed scheme with a coherent strategy should result in better decisions being made and fewer surprises arising along the route.

The challenge is that the longer term remains full of uncertainty and many people’s initial reaction is to conclude that it sounds too complicated, as well as being a long way off, and thinking about it will be wasteful or expensive. The purpose of this paper is to present Aon Hewitt’s latest thinking about what the longer term may look like.

It also involves schemes being aware of the nature and size of the risks which they are continuing to run.

We believe that for many schemes, this could affect their more immediate, shorter term decisions – for example, whether contributions should be paid directly to the scheme or whether it would be more sensible to hold some of them in some sort of contingent vehicle outside of the scheme.

In this paper:

» We discuss the range of schemes’ long-term objectives, including reviewing recent survey data;
» We examine the concept of self-sufficiency;
» We explore what the Pensions Stability world may look like;
» We consider how this may affect the decisions which schemes make now.

We hope that you find this paper interesting and informative. If you have any questions or would like to explore any of the issues raised in further detail, then please contact the Aon Hewitt Pensions Stability team (at enquiries@aonhewitt.com or 0800 279 5588) or your usual Aon Hewitt consultant. We would also like to give recognition and special thanks to the authors of this paper:

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For many private sector schemes, our view is that it will involve reaching a low risk ‘Pensions Stability’ environment, often, but not always, as a precursor to full buy-out. We believe that this low risk world of Pensions Stability can be made to work but this requires planning in terms of getting to both the right funding structure and the most suitable investment strategy.
A vision of the long term

Some schemes have the objective of getting as quickly as possible to the position where they can buy out their benefits with an insurance company. They are looking to keep their foot firmly on the gas as long as possible in terms of expected returns from their investment strategy and the associated risks being run. In particular, they will be prepared to run the risk of further large deficits emerging right up to the point when they are able to buy out.

For these schemes, their long-term strategy is straightforward – carry on as they are and hope that things work out satisfactorily. This strategy works best when the scheme is backed by a strong sponsoring employer who is able to bear the associated risks.

For many schemes though, the long-term is more complex than this:

- They would like to get to buy-out eventually;
- But they would also like to significantly reduce the risks they run on the journey.

Terms such as self-sufficiency are often used in this context. In practice, self-sufficiency is a bit of a catch-all phrase and it encapsulates a variety of different approaches. But the common underlying theme is that it means a scheme being in the position where it has a much reduced, and possibly virtually zero, ongoing reliance on its sponsoring employer.

It is not surprising that this is a potentially attractive concept when you consider:

- All the deficit contributions which have been paid to schemes in the past 10 years and the associated strains on company-trustee-member relationships that these have caused;
- That many sponsors are likely to be reluctant to pay more contributions than are absolutely necessary to schemes which mostly consist of members no longer working for them. In other words, funding discussions may well become more difficult in the future rather than less difficult;
- Since its introduction in 2005, over 650 schemes have transferred to the Pension Protection Fund (PPF), affecting around 200,000 members (and there are about a further 200 schemes currently undergoing PPF assessment). Although it has provided a safety net, the vast majority of members in the PPF have had their benefits or their pension increases or both scaled back with some, mostly larger pensions, being reduced dramatically.

So, many schemes are aiming for a balance between trying to reach a safer position while still being in a position to generate some investment returns to close the remaining gap to buy-out.

For a minority of schemes, aiming to reach a long-term position of relative stability may be the endgame in itself – for example, because:

- The trustees are willing to continue to rely on their sponsoring employer’s covenant over the longer term rather than transfer the scheme to an insurer;
- The scheme does not wish to pay for the insurance company’s profit margins;
- There may be some other reason such as the scheme having an open defined contribution (DC) section which can be used to ‘soak up’ surplus from the DB section. We expand on this idea on page 17.

For all schemes (other than those where the aim is simply to get to buy-out as quickly as possible no matter what the risks) it will become increasingly important to understand what this environment – the world of Pensions Stability – will entail.
As part of the Aon Hewitt 2013 Global Risk Survey (which had responses from 222 predominantly private sector UK pension schemes with around £300 billion of assets) we asked how schemes would describe their main long-term objective. Self-sufficiency was the most popular response with 45% of responses favouring this, compared to 20% for buy-out and 19% for a low-risk target.

As Chart 1 shows, the responses varied by size of scheme, with the largest schemes being more likely to suggest self-sufficiency or a low risk target as their long term objective, while buy-out was a more popular response for the smallest schemes (although even for these schemes, it was still not quite as popular as self-sufficiency). But what these responses do not tell us is what people mean by self-sufficiency, and how they would distinguish this from a more general low risk target.

A recent internal Aon Hewitt survey of about 100 schemes found a wide range of self-sufficiency funding targets with relatively limited overall consensus. Most of the funding targets fell within a range of about 15% of assets required (ranging from a discount rate of about 0.25% p.a. below gilt yields to a discount rate of about 0.5% p.a. above gilt yields). However, across all of the schemes surveyed, there was a significantly larger difference between the highest and lowest funding targets – but all described this as self-sufficiency.

Chart 1: Long term objective

<table>
<thead>
<tr>
<th>Category</th>
<th>Buy-out</th>
<th>Self sufficiency</th>
<th>Low risk target</th>
<th>Other</th>
<th>No objective (yet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over £1bn</td>
<td>7%</td>
<td>53%</td>
<td>24%</td>
<td>8%</td>
<td>8%</td>
</tr>
<tr>
<td>£100m - £1bn</td>
<td>17%</td>
<td>47%</td>
<td>18%</td>
<td>6%</td>
<td>12%</td>
</tr>
<tr>
<td>Under £100m</td>
<td>33%</td>
<td>37%</td>
<td>17%</td>
<td>9%</td>
<td>4%</td>
</tr>
</tbody>
</table>
The first question we asked was about how confident trustees wanted to be that their scheme members will receive their benefits in full (and without the scheme dropping into the PPF). Not surprisingly, the responses showed that paying the benefits in full is very much the ultimate measure of success for most trustees with almost three-quarters of respondents wanting there to be at least a 95% chance of the benefits being paid in full. Nearly half of respondents wanted there to be at least a 99% chance of the benefits being paid in full – a target that members would presumably want too.

If trustees are to be successful in this objective then they face a choice:

- Either to continue to rely on their sponsoring employer’s covenant (at least to an extent);
- Or to reach the position where they are confident that the benefits can be paid without needing to rely on the sponsoring employer.

As we show later in this report, being confident that a scheme no longer needs to rely on its sponsoring employer can only be achieved by funding it to a very high level in the first place – in practice a funding level approaching buy-out. So the reality for most trustees is that if they want to be highly confident that members will receive their benefits, they will need to continue to work with their sponsoring employer and within the constraints of their sponsoring employer’s covenant for quite a significant number of years to come.

The second question we asked was what level of probability would sponsors be prepared to accept of needing to pay substantial additional contributions to their scheme even after it has become ‘fully funded’. The results here were a bit more mixed with there being a very rough consensus that the likelihood should be around 10%. In other words, sponsors would like ‘full funding’ to mean the end of their requirement to contribute but they are realistic enough to accept that there could be certain more extreme circumstances where further contributions will be needed (or perhaps they want to continue to run sufficient risk to enable the scheme to close the gap to buy-out).

Putting the responses to these two questions together paints an interesting picture:

- Trustees want to pay the benefits with a high degree of certainty which, in practice, means continuing to work with and rely on their sponsoring employer;
- Sponsors do not want to pay further contributions once they reach full funding apart from in the more extreme situations.

The responses to both questions point towards the attractions of low risk ‘Pensions Stability’ solutions.

To test people’s attitudes in more detail in this area, we asked a series of questions during the course of this year’s Aon Hewitt Pension Conferences.

On page 11, we examine Pensions Stability solutions in further detail. But first we consider the concept of self-sufficiency and explore why trying to eliminate virtually all risk is unlikely to be the answer for most schemes.
What sort of level of funding does a scheme need in order to have confidence that it can pay members’ benefits when they fall due without needing to rely on further support from the sponsoring employer?

For many people, this question summarises how they would intuitively describe their scheme as being self-sufficient. Certainly, it is consistent with the definitions of self-sufficiency that can be found in the dictionary – these include ‘needing no outside help in satisfying one’s basic needs’ and being ‘able to live or function without help or support from others’. Clearly, the uncertainty of the real world means that it is impossible for a scheme to protect against all extreme scenarios and so some pragmatism is required.

To explore this further, we have modelled what self-sufficiency might look like for a closed private sector scheme with fairly typical characteristics – for example, having a roughly even split between pensioner and non-pensioner liabilities and with the majority of its benefits being linked to inflation. Many public sector schemes will also be reasonably similar to this. Appendix A gives more details how we have carried out our modelling and about the scheme involved.

We have defined a scheme as being self-sufficient if the probability of it having a funding deficit at the end of any of the next 20 years is less than 1%. We have focused on the position at the end of each year because we suspect that schemes in these situations may view three years as being too long a gap between formal funding assessments. Instead, carrying out assessments on an annual basis could represent a pragmatic balance between schemes recognising their latest funding position and not over-reacting to short term market fluctuations.

As a result, under our definition of self-sufficiency, the likelihood of the sponsoring employer being required to pay further contributions in the next 20 years is less than 1%. While this does not represent absolute certainty that members’ benefits will be paid, it does provide a very high likelihood that they will (or in the context of the Local Government Pension Scheme (LGPS), that there will not be a deficiency on exit within 20 years which might fall to be met by the other employers in the LGPS). It is undoubtedly a tough measure – for example, we believe that it is stronger than insurers’ reserving requirements (which essentially are to be able to withstand a 1 in 200 event over the course of the next year only).

Using the results of our modelling, we have made some key observations in relation to self-sufficiency:

**Observation 1 – An investment strategy consisting entirely of gilts (or swaps with cash) is not risk free.**

We started by modelling an investment strategy consisting entirely of gilts. Many people would instinctively view this as an appropriate investment strategy for self-sufficiency in combination with:

- A funding target set to be in line with gilt yields;
- A funding level of 100% on this basis.

However, the results of our modelling suggest that this strategy does not produce stable funding outcomes, particularly over longer periods, for a number of reasons:

- Unless mortality risk has been hedged, this would result in considerable potential variability in the funding position;
- Certain features of the liabilities are very difficult or impossible to hedge in practice – for example, all of the different types of pension increase in payment and deferment, any benefits linked to CPI (where perfect hedging instruments do not yet exist) or even attempting to replicate monthly pension payments exactly. And non-pensioner members have a variety of options, such as when they will retire, how much pension to convert to tax free cash or whether to take a transfer value;
- Investment management fees (such as those needed to maintain the accuracy of the liability hedging) mean that a funding level of 100% on a gilts basis is unlikely to be sufficient to provide the benefits;
- There will always be legislative uncertainty and other potential changes which are outside a scheme’s control. For example, just over the last 10 years, we have seen the switch from RPI to CPI for statutory pension increases, the introduction of age discrimination legislation, civil partnerships and same sex marriages and the radical changes proposed in the 2014 Budget. Over the coming years, there remains considerable uncertainty about what will be the impact of sex discrimination legislation and GMP equalisation, not to mention the other ‘unknown unknowns’.
And, of course, if a scheme’s investment strategy only consists of gilts, then if things do fall behind, the investment strategy is unlikely to be able to generate sufficient returns to catch up again.

The range of funding outcomes will depend on the exact make up of the scheme’s liabilities (e.g. its pension increases) and the extent to which it is possible to hedge these risks. However, over a 20 year period starting from a funding position of 100% on a gilts basis, our modelling shows that over half of outcomes end up with a funding level either less than 95% or more than 105%, even if mortality is hedged, although it is the case that the scheme is likely to be significantly smaller in 20 years’ time than today.

It is also important to note that the analysis above has been carried out assuming that the sponsoring employer continues to meet all expenses apart from investment management expenses. To be truly self-sufficient, a scheme would need to hold a reserve for the expected level of these other expenses over the future lifetime of the scheme as well – the reserve would typically range from perhaps 1% of liabilities for a larger scheme, to over 5% of liabilities for some smaller schemes. And this will introduce further uncertainty around how the funding level will develop.

An alternative strategy to investing in gilts would be to invest in a combination of swaps (to hedge the liabilities) and cash (to generate LIBOR returns to fund the swaps). This could reduce some of the risks being run – for example, by purchasing swaps, albeit at a cost, which match the scheme’s pension increases exactly (including any caps and floors). But it does not eliminate all the risks and it introduces fresh challenges such as needing the cash to generate LIBOR returns.

As well as an investment strategy consisting entirely of gilts, we have modelled other strategies starting with one targeting a return of 0.5% p.a. in excess of gilt yields. Targeting these higher investment returns introduces investment risks as it is no longer possible for the investment strategy to generate the targeted returns with certainty. In our modelling, we have assumed that:

- The targeted investment return of 0.5% p.a. in excess of gilt yields is net of investment manager fees. In other words, the target before investment manager fees will be higher than this;
- Interest rate, inflation and mortality risks have been fully hedged, using derivatives where needed. In particular, there will be a cost involved in hedging mortality risk but the results of our modelling would be significantly more uncertain without this hedging;
- The funding target is also set to be 0.5% p.a. in excess of gilt yields with the funding level being assumed to be 100% at 31 December 2013. To ease comparison with different results shown later in this report, the assets and liabilities have both been set to be £100m at 31 December 2013.

Chart 2 shows the uncertainty of the development of the scheme’s funding position (i.e. its surplus or deficit) over the next 20 years based on this investment strategy. Our modelling involves a large number of projections of the future under varying economic and market conditions:

- The line at the top of the blue area is the 95th percentile outcome (i.e. only 5% of outcomes would be expected to be better than this);
- The line at the bottom of the red area is the 5th percentile (i.e. only 5% of outcomes would be expected to be worse than this);
- The chart also has lines marking the 25th, 50th (i.e. median) and 75th percentiles;
- The red line at the bottom is the first percentile.

Observation 2 – From a funding perspective, self-sufficiency would involve covering both of the following:

- A best estimate of the funds that are expected to be needed to pay the scheme’s benefits (the ‘basic funding target’) – this is likely to be higher than the current level of technical provisions for most schemes;
- An additional buffer to protect against adverse future experience.
Chart 2 shows a very large range of funding outcomes over a 20 year period from what would commonly be regarded as being a reasonably low-risk investment portfolio (especially when you consider that the scheme is not running interest rate, inflation or mortality risks) – there is a 90% likelihood that the funding position will be between a deficit of £12m and a surplus of £45m after 20 years.

Therefore, if we want the funding position to have a 99% chance of not having a deficit over the 20 year period, then the scheme will need to hold a substantial buffer to protect against adverse future experience.

Observation 3 – Incorporating a funding buffer to protect against adverse future experience means that self-sufficiency will often be seen as an excessively high funding target.

The funding buffer can be significant – our modelling shows that a buffer of £10m would be needed if we are to be 99% certain that no further contributions will be required from the sponsoring employer over the next 20 years (in addition to the basic funding target of £100m on a gilts + 0.5% p.a. basis). As noted previously, if future expenses are met by the scheme rather than the sponsoring employer, then the scheme would also need to hold a reserve to cover these, which would push up the self-sufficiency funding target further.

For comparison, based on market conditions applying in spring 2014, total funding of about £122m would be needed to be able to buy out the scheme’s liabilities with an insurance company (i.e. £12m more than the additional funding buffer).

Chart 3 shows the projected development of the scheme’s funding position over the next 20 years starting with the initial funding buffer of £10m. Again, the red line at the bottom represents the first percentile with only 1% of outcomes being expected to be worse than this. The key point to note in Chart 3 is that the red line stays in surplus throughout the next 20 years, so a funding buffer of £10m would meet our definition of self-sufficiency.

Chart 3 is based on an investment strategy targeting gilts + 0.5% p.a. What would be the position if a different investment return was targeted? In order to quantify this, Table 1 compares the funding targets (including the additional funding buffers) that would be needed for self-sufficiency for five different investment strategies (ranging from a pure gilts target to one based on gilts + 1% p.a.) together with what we have called the Buy-Out Shortfall - where there is a 1% likelihood of the buy-out deficit being larger than this figure in 20 years’ time.

Although the exact results will vary by scheme, the modelling shows that the total funds required to be self-sufficient with the different investment strategies are very similar, with the total funds required being slightly higher for the strategy targeting gilts + 0% p.a. than the ones targeting higher returns.

As shown in the right hand column of Table 1, the flip side is that if things go wrong, then the consequences are likely to be more severe with the strategies targeting higher returns since they are running higher levels of investment risk. In other words, if a deficit emerges, then it is more likely to be a larger deficit. Having said this, the differences in the Buy-Out Shortfalls shown in Table 1 are relatively limited.
Observation 4 – Self-sufficiency does not eliminate variability.

It is very difficult to construct investment portfolios which consistently and steadily deliver low risk returns over long periods in all circumstances. This was illustrated in the variability of the funding outcomes shown in Chart 3 (which is based on a gilts + 0.5% p.a. investment strategy) although even for a scheme with a pure gilts strategy, there is still significant variability for the reasons outlined previously. At very low risk levels, the funding position becomes increasingly sensitive to small variations in experience such as the accuracy of the interest rate and inflation hedging. Once these variations occur, it can be difficult to get back on track.

Of course, a scheme having a strong governance framework (either directly or via a fiduciary mandate) and thereby taking an active approach to asset allocation should reduce funding level variability – for example, taking profits when an asset class has performed strongly and taking action to provide protection against particular adverse scenarios. But a significant amount of variability will still remain. This means that an important part of self-sufficiency (and low risk solutions more generally) is about managing the upside and this is a concept which we will return to later in this paper.

Pulling all of the observations in this section together, self-sufficiency (as we have defined it) results in a funding target which is very high – for many schemes it may be beginning to approach the full buy-out target. In addition, the funding position remains inherently unstable when considered over long periods. In practice, it is difficult to see this definition of self-sufficiency appealing to many schemes as a destination in its own right – rather than buy-out, for example.

Therefore, for most schemes, the long-term will continue to involve managing some risk, at least until they are in a position to be able to buy-out with an insurance company. This is the Pensions Stability environment and the questions are then about how much risk should be taken and what can be done to manage it?

<table>
<thead>
<tr>
<th>Expected return of investment strategy</th>
<th>Basic funding target</th>
<th>Additional funding buffer</th>
<th>Total funds required</th>
<th>Buy-Out Shortfall*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gilts + 0% p.a.</td>
<td>£109m</td>
<td>£3m</td>
<td>£112m</td>
<td>£4.7m</td>
</tr>
<tr>
<td>Gilts + 0.25% p.a.</td>
<td>£104m</td>
<td>£6m</td>
<td>£110m</td>
<td>£5.2m</td>
</tr>
<tr>
<td>Gilts + 0.5% p.a.</td>
<td>£100m</td>
<td>£10m</td>
<td>£110m</td>
<td>£6.1m</td>
</tr>
<tr>
<td>Gilts + 0.75% p.a.</td>
<td>£96m</td>
<td>£14m</td>
<td>£110m</td>
<td>£6.7m</td>
</tr>
<tr>
<td>Gilts + 1.0% p.a.</td>
<td>£92m</td>
<td>£19m</td>
<td>£111m</td>
<td>£7.0m</td>
</tr>
<tr>
<td>Approximate buy-out liabilities (for comparison)</td>
<td>£122m (today)</td>
<td></td>
<td></td>
<td>£76m** (median in 20 years' time)</td>
</tr>
</tbody>
</table>

* This represents the first percentile buy-out deficit in 20 years’ time.

** The main reason that the buy-out liabilities are expected to be lower in 20 years’ time is because the scheme will have paid out a significant proportion of its liabilities by then.
Focus on the public sector

Scheme managers of the Local Government Pension Scheme (LGPS) have traditionally taken the approach of continuing to hold growth-biased investment strategies with the expectation that things work out satisfactorily over the longer term. This is on the basis that the strength of the tax-raising employers is considered to be beyond question and the concept of ‘endgame’ has, to date, only been considered relevant to a few small employers. However, we believe that public sector schemes are beginning to acknowledge that risk analysis has an increasingly important part to play in setting long-term strategy.

In the LGPS, there is no power to buy-out the pension liabilities of former employers (such as the liabilities arising from historic contractors). An orphan funding target will tend to be a destination in its own right, although a less sophisticated approach is usually taken in light of the relatively small size of the liabilities under consideration from these employers. Affordability constraints apply equally here, with few employers fully funded on an orphan funding target.

However, once an employer has left the LGPS and the funding position has been restored to 100% on an orphan basis (if a deficit exists on exit), the concept of self-sufficiency often fades away – to date the size of the liabilities involved relative to the LGPS as a whole has meant that there has been little incentive to pursue a low risk investment strategy in relation to the orphan liabilities. We expect that position to change as the LGPS matures and the size of the orphan liabilities increases (in relative and absolute terms).

The concept of self-sufficiency also resonates in the LGPS, particularly in cases where there are employers who may only be participating in the LGPS for a fixed term (for example, local government outsourcing contractors). In these cases, the remaining employers want a low likelihood of being asked to make further contributions for the pension benefits accrued by members of former LGPS employers. One approach to this is to adopt an ‘orphan’ funding target whereby the short-term employer reaches a self-sufficiency type funding target by the time that all of their employees have left service.
So, if self-sufficiency has its limitations, what do we mean in practice by Pensions Stability?

We believe that this will depend on the priorities of each scheme and its sponsor and so the same solution will not be appropriate for everyone. For many schemes and their sponsors, their Pensions Stability objectives will be a combination of the following:

- Keeping the risk of further contributions being required from the sponsoring employer appropriately low. In some cases (such as the Local Government Pension Scheme) it may be the variability of the size of the contributions which is the key issue;
- Keeping the buy-out deficit from exceeding a certain level – i.e. with the aim of controlling the ultimate covenant risk and so the degree to which the security of members’ benefits is potentially at risk;
- Keeping the sponsoring employer’s accounting position (e.g. under IAS19, FRS17/102 or US GAAP) stable;
- Maintaining sufficient liquidity to meet benefit payments and any other cashflow requirements;
- Wanting to reach full buy-out within a certain timescale.

These objectives will lead to different and sometimes conflicting responses. For example, considering the potential implications for investment strategies:

- Aiming to control contribution risk would suggest a low risk investment strategy;
- Aiming to keep the sponsoring employer’s accounting position stable would suggest holding significant corporate bond investments;
- Aiming to buy out within a certain timescale would suggest having a certain proportion of growth assets to generate the expected returns required to do this.

In practice, most schemes will want to take account of more than one of these different objectives and so the resulting funding targets and investment strategies will represent a balance between them. In addition, schemes will need to consider the operational aspects of Pensions Stability such as having the right governance structures. These operational aspects are not discussed in this paper but we have produced separate material which examines them in more detail.

To date, LGPS funds have tended to have the best of both worlds:

- Contribution risk is controlled directly through the regulatory requirement for the actuary to have regard to the stability of employer contributions, supported by the statutory Funding Strategy Statements of administering authorities; and
- Credit is taken for the growth-biased investment strategy in setting employer contributions.

Whether or not such an approach is sustainable in the face of increasing maturity is not clear and it is worth noting that scrutiny of LGPS funding plans, particularly deficit recovery plans, is increasing.
In modelling self-sufficiency, we investigated the situation where there was a 1% chance of a deficit at the end of any of the next 20 years – and which would result in the sponsoring employer being required to pay further contributions to the scheme.

One of the obvious comparable objectives in a Pensions Stability environment would be to replace the 1% chance of a deficit with a higher – but still fairly low – chance of a deficit arising, say 5%, 10% or 25%. The results of our modelling of the total funds required are shown in Table 2 – with all of the investment strategies once again having an expected return of gilts + 0.5% p.a. and 100% of a gilts + 0.5% p.a. funding target being set equal to £100m.

Table 2 shows that the additional buffer required reduces significantly if the scheme is prepared to accept a higher likelihood of the sponsoring employer being required to pay further contributions. As the likelihood of the sponsoring employer being required to pay further contributions increases, the difference between the funding target and the full buy-out level (which, as noted previously, would be about £122m based on market conditions applying in spring 2014) also grows. Pensions Stability starts to look more affordable to a sponsor.

Table 2 also shows that it becomes increasingly expensive to remove the final elements of risk from a scheme.

To reduce the risk of the sponsoring employer needing to pay contributions in the next 20 years from 25% to 10% requires an additional buffer of £2m, whereas to reduce the risk from 5% to 1% requires a 50% larger increase in the buffer of £3m.

A further development of the approach in Table 2 would be where a scheme is prepared to have relatively small deficits emerge (on the basis that it is confident that its sponsoring employer can cope with these, even in the longer term) but does not want large ones. There are clearly many ways in which schemes could develop these objectives to form an approach which is appropriate for the specific circumstances of their sponsor and trustees – and this could also be attractive for some employers in the Local Government Pension Scheme.

One example would be to aim to limit the chance of the funding level falling below 95% at the end of any of the next 20 years. We have modelled the total funds which would be required in this situation and the results are shown in Table 3. As for Table 2, the investment strategies have an expected return of gilts + 0.5% p.a. with 100% of a gilts + 0.5% p.a. funding target being set equal to £100m. Table 3 shows that the total funds required are typically about £2m lower than those shown in Table 2 where the objective was for the funding position not to fall below 100% at the end of any of the next 20 years.

### Table 2: Funds required and likelihood of further contributions

<table>
<thead>
<tr>
<th>Likelihood of sponsoring employer being required to pay further contributions in the next 20 years</th>
<th>Basic funding target</th>
<th>Additional funding buffer</th>
<th>Total funds required</th>
</tr>
</thead>
<tbody>
<tr>
<td>1%</td>
<td>£100m</td>
<td>£10m</td>
<td>£110m</td>
</tr>
<tr>
<td>5%</td>
<td>£100m</td>
<td>£7m</td>
<td>£107m</td>
</tr>
<tr>
<td>10%</td>
<td>£100m</td>
<td>£6m</td>
<td>£106m</td>
</tr>
<tr>
<td>25%</td>
<td>£100m</td>
<td>£4m</td>
<td>£104m</td>
</tr>
</tbody>
</table>

### Table 3: Funds required and lower funding targets

<table>
<thead>
<tr>
<th>Likelihood of funding level falling below 95% at end of any of the next 20 years</th>
<th>Basic funding target</th>
<th>Additional funding buffer</th>
<th>Total funds required</th>
</tr>
</thead>
<tbody>
<tr>
<td>1%</td>
<td>£100m</td>
<td>£8m</td>
<td>£108m</td>
</tr>
<tr>
<td>5%</td>
<td>£100m</td>
<td>£5m</td>
<td>£105m</td>
</tr>
<tr>
<td>10%</td>
<td>£100m</td>
<td>£4m</td>
<td>£104m</td>
</tr>
<tr>
<td>25%</td>
<td>£100m</td>
<td>£1m</td>
<td>£101m</td>
</tr>
</tbody>
</table>
We have also investigated what happens if we vary the funding level which the scheme does not want to fall below. Table 4 shows the results of our modelling of the total funds required assuming a 1% likelihood of falling below the specified funding level at the end of any of the next 20 years. Again, all of the results have been calculated using an investment strategy with an expected return of gilts + 0.5% p.a.

Table 4 shows only a gradual reduction in the total funds that the scheme would need to hold with a significant funding buffer still being required even if the objective is based on keeping above a funding level as low as 90%.

The analysis underlying Tables 2, 3 and 4 has been carried out using an investment strategy targeting returns of gilts + 0.5% p.a. What would be the equivalent funding targets and associated Buy-Out Shortfalls based on different investment strategies? We have investigated these for the same range of investment strategies as in Table 1. Table 5 shows the results of our modelling for the scenario where there is a 10% likelihood of the sponsoring employer being required to pay further contributions (of whatever size) in the next 20 years.

Table 5 shows that if there is a 10% likelihood of further contributions being required from the sponsoring employer, then (unlike for pure self-sufficiency) the investment strategy has a significant effect on the total funds required with significantly lower total initial funds being required for higher return strategies. Sponsors in particular may be attracted by these lower total funding targets.

However, continuing to run higher return strategies also involves higher levels of risk and so it would also be important to assess what happens if experience is unfavourable. There is a wide range of Buy-Out Shortfalls shown in Table 5 with those linked to higher target return strategies becoming increasingly significant. For example, the Buy-Out Shortfall of £22m (under a gilts + 1% p.a. investment strategy) would represent a large reduction in members’ benefits.

In the Pensions Stability world, schemes will need to strike the right balance between the desire to have a realistic funding target and the risks being run. Further factors to consider may well include linking the funding and investment strategies with an objective to be able to buy out the scheme’s benefits in due course and, more generally, dealing with surpluses which arise. These are discussed in the next sections.

### Table 4: Funds required and variable funding targets

<table>
<thead>
<tr>
<th>Investment strategy with expected return of gilts + 0.5% p.a.</th>
<th>1% likelihood of falling below the funding level shown at the end of any of the next 20 years</th>
<th>Basic funding target</th>
<th>Additional funding buffer</th>
<th>Total funds required</th>
</tr>
</thead>
<tbody>
<tr>
<td>100%</td>
<td>£100m</td>
<td>£10m</td>
<td>£110m</td>
<td></td>
</tr>
<tr>
<td>98%</td>
<td>£100m</td>
<td>£9m</td>
<td>£109m</td>
<td></td>
</tr>
<tr>
<td>95%</td>
<td>£100m</td>
<td>£8m</td>
<td>£108m</td>
<td></td>
</tr>
<tr>
<td>90%</td>
<td>£100m</td>
<td>£6m</td>
<td>£106m</td>
<td></td>
</tr>
</tbody>
</table>

### Table 5: Funds required with higher likelihood of further contributions

<table>
<thead>
<tr>
<th>Expected return of further sponsor contributions being required in the next 20 years</th>
<th>Basic funding target</th>
<th>Additional funding buffer</th>
<th>Total funds required</th>
<th>Buy-Out Shortfall*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gifts + 0% p.a.</td>
<td>£109m</td>
<td>£2m</td>
<td>£111m</td>
<td>£7m</td>
</tr>
<tr>
<td>Gifts + 0.25% p.a.</td>
<td>£104m</td>
<td>£4m</td>
<td>£108m</td>
<td>£10m</td>
</tr>
<tr>
<td>Gifts + 0.5% p.a.</td>
<td>£100m</td>
<td>£6m</td>
<td>£106m</td>
<td>£13m</td>
</tr>
<tr>
<td>Gifts + 0.75% p.a.</td>
<td>£96m</td>
<td>£8m</td>
<td>£104m</td>
<td>£18m</td>
</tr>
<tr>
<td>Gifts + 1.0% p.a.</td>
<td>£92m</td>
<td>£10m</td>
<td>£102m</td>
<td>£22m</td>
</tr>
<tr>
<td>Approximate buy-out liabilities (for comparison)</td>
<td>£122m (today)</td>
<td></td>
<td>£76m (median in 20 years time)</td>
<td></td>
</tr>
</tbody>
</table>

* As explained on page 8, the Buy-Out Shortfall represents the first percentile buy-out deficit in 20 years’ time.
So far, we have mainly considered Pensions Stability from the perspective of the likelihood of the sponsoring employer being required to pay further contributions.

Of course, on the other side of this coin are scenarios where experience is favourable. Assuming that there is some degree of prudence in the actuarial valuation assumptions, there is at least a 50% chance of this happening. In this case, the scheme may reach a position where it is able to buy out its benefits or the sponsor can afford to write a cheque to make good the difference.

We have modelled this for a gilts + 0.5% p.a. investment strategy starting from the various funding positions shown in Table 2. In each case, we have assessed what proportion of scenarios will reach an approximate buy-out funding level at some point in the next 10 or 20 years. In doing this, we have made allowance for the relationship between the buy-out funding level and the gilts + 0.5% p.a. funding target to change over time:

- Based on market conditions applying in spring 2014, a funding level of about 122% (on a gilts + 0.5% p.a. basis) would be needed to be able to buy out the scheme’s liabilities with an insurer;
- In 20 years’ time, as a result of the scheme maturing and a much larger proportion of the membership being pensioners, the corresponding funding level might be about 112% (on a gilts + 0.5% p.a. basis).

The results of our modelling are shown in Table 6 (and, as noted above, all of the results in Table 6 are based on an investment strategy targeting gilts + 0.5% p.a.).

Table 6 shows that the likelihood of reaching the full buy-out position within 20 years is greater than 50% in all the cases. Not surprisingly, it also shows that the higher the initial funding level, the more likely it is that buy-out will be reached in either the next 10 or 20 years. The chances of reaching the buy-out funding position within 10 years are much lower than within 20 years, reflecting the shorter timeframe for asset outperformance and the higher cost of buy-out in the early years (as the scheme is less mature). In particular, if the scheme starts at the higher initial funding positions shown in Table 6, very little (if any) asset outperformance will be required to reach the full buy-out position within the next 20 years – instead, the increasing maturity of the scheme by itself is likely to be sufficient for the scheme to achieve this. This explains the very high likelihood of the scheme reaching full buy-out within the next 20 years starting from these higher funding levels.

We have also considered how the likelihood of reaching buy-out depends on the investment strategy. Table 7 shows the results of our modelling for the same investment strategies shown in Table 5 and again assuming that there is a 10% likelihood of the sponsoring employer being required to pay further contributions in the next 20 years.

Table 6: Probabilities of reaching buy-out

<table>
<thead>
<tr>
<th>Investment strategy with expected return of gilts + 0.5% p.a.</th>
<th>Total assets held today (including funding buffer)*</th>
<th>Likelihood of funding reaching buy-out position in the next 10 years</th>
<th>Likelihood of funding reaching buy-out position in the next 20 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Likelihood of sponsoring employer being required to pay further contributions in the next 20 years</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1%</td>
<td>£110m</td>
<td>35%</td>
<td>95%</td>
</tr>
<tr>
<td>5%</td>
<td>£107m</td>
<td>16%</td>
<td>82%</td>
</tr>
<tr>
<td>10%</td>
<td>£106m</td>
<td>12%</td>
<td>71%</td>
</tr>
<tr>
<td>25%</td>
<td>£104m</td>
<td>8%</td>
<td>51%</td>
</tr>
</tbody>
</table>

* Where £100m is 100% of a gilts + 0.5% p.a. funding target.
Table 7 shows that all the strategies have a reasonably high chance of reaching buy-out in the next 20 years. With a higher return strategy, this is as a result of investment returns closing the gap, whereas the lower return strategies start with more assets. Importantly, Table 7 shows that, in general, the strategies targeting higher returns are more likely to reach full buy-out in the next 20 years. This illustrates the drawbacks of de-risking too much too soon and that if a scheme wants to push on towards buy-out, then it is important to continue to hold sufficient growth assets to achieve this.

However, it is also important to view these results alongside the Buy-Out Shortfall figures (i.e. the first percentile buy-out deficits in 20 years’ time) that were shown in Table 5, and that there is a much larger potential for significant deficits to emerge with strategies targeting higher returns. Putting this together with the analysis from the previous section, we can see that a Pensions Stability strategy will involve schemes reaching a balance between:

- A realistic funding target;
- Keeping the level of risk being run at an appropriate level;
- Their ability to reach the buy-out funding position.

Table 7: Probabilities of reaching buy-out and investment policy

<table>
<thead>
<tr>
<th>Expected return of investment strategy</th>
<th>Total assets held today (including funding buffer)*</th>
<th>Likelihood of funding reaching buy-out position in the next 10 years</th>
<th>Likelihood of funding reaching buy-out position in the next 20 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gilts + 0% p.a.</td>
<td>£111m</td>
<td>14%</td>
<td>66%</td>
</tr>
<tr>
<td>Gilts + 0.25% p.a.</td>
<td>£108m</td>
<td>11%</td>
<td>59%</td>
</tr>
<tr>
<td>Gilts + 0.5% p.a.</td>
<td>£106m</td>
<td>12%</td>
<td>71%</td>
</tr>
<tr>
<td>Gilts + 0.75% p.a.</td>
<td>£104m</td>
<td>22%</td>
<td>80%</td>
</tr>
<tr>
<td>Gilts + 1.0% p.a.</td>
<td>£102m</td>
<td>30%</td>
<td>83%</td>
</tr>
</tbody>
</table>

* Where £100m is 100% of a gilts + 0.5% p.a. funding target.

In Appendix C we have examined how taking advantage of favourable market conditions to purchase ‘buy-in’ bulk annuity policies can increase the likelihood of the scheme reaching the buy-out funding position.
The modelling above has been carried out on the basis that favourable experience is used to increase the scheme’s funding buffer with no changes to the scheme’s investment strategy. A variation on this would be for the scheme to use the favourable experience to justify de-risking its investment strategy further.

But should this be true in all cases? We think that there is a risk of a herd mentality developing in the DB world, in taking the view that DB pensions are ultimately best provided through bulk annuities in the insurance sector. This is somewhat ironic because the herd mentality in the DC world, especially following the 2014 Budget announcements, is in the opposite direction away from annuities. It is more ironic when you consider that it is companies (who in many cases have the experience and expertise to manage and bear risk) who are very keen to access the annuity market, whereas individuals (who in many cases are able to manage and bear very little risk) seem equally desperate to avoid it.

The insurance markets may be the best ultimate destination for many, if not most, UK DB pension schemes. However, we do question whether sponsors should want to delay locking into annuity rates until:

- Their scheme’s membership is older and so will be viewed as less risky by the insurers, and / or;
- Their scheme is smaller and so any funding strain should also be smaller, and / or;
- Market conditions are truly compelling.

Trustees may be happy to continue to rely on their sponsoring employer’s covenant, at least over the medium term, as long as they are actively monitoring it, the reliance on covenant is modest relative to scheme liabilities and, ideally, the trustees have contingency plans in place in case it deteriorates.

We think that a significant number of schemes would agree with this assessment. However, what has traditionally been seen as a barrier, is that once money is in a pension scheme it cannot easily be refunded - at least until the scheme has been bought out. We suggest that this restriction is the equivalent of forcing people to purchase annuities in the DC world and that it has partly driven the thinking that buy-out is the only answer.

But, there are alternatives to consider here (just as even before the Budget, annuities were technically not compulsory in the DC world) – although not the same flexibility as the DC world is about to experience. In particular, holding funding buffers outside of and separate from the scheme (for example, as escrow accounts or some other form of contingent asset) can have an important role to play and we have produced separate research on these.

We believe that an attractive long-term strategy for a significant proportion of schemes can be where most of the assets are held within the DB scheme but some are held as a buffer separately from the scheme. In particular, we see the key attractions of this strategy as being:

- **Flexibility** – The funds held outside the scheme can be used to top up a funding shortfall within the scheme if needed. Or, if there are good returns, they can be paid back to the sponsoring employer. Clearly, if payments are able to be made back to the sponsoring employer, then the chances are increased that further contributions from the sponsoring employer will be needed in future years. However, the concept of the sponsor being able to receive as well as make payments could be attractive for both sponsors and trustees to consider, especially as schemes become close to or in excess of 100% funded on their technical provisions assumptions;

- Depending on the sponsoring employer’s corporation tax rate, paying money into a funding buffer held outside of the scheme may sometimes be financially attractive to a sponsor, compared to putting money into a scheme – or at least broadly cost neutral. This will particularly be the case for sponsoring employers with very low rates of corporation tax.
These points apply equally in the Local Government arena where many short-term employers are becoming increasingly concerned about 'trapped surpluses' emerging.

For DB schemes with open DC sections and appropriate rules, surplus in the DB section could be used to pay DC contributions. Charts 4 and 5 below are for a scheme which starts off as being just below 120% funded (on a standard technical provisions basis):

- Chart 4 shows how the funding level is currently expected to develop over future years. In most scenarios, the funding position is expected to improve and there is also a very wide range of funding outcomes;

- Chart 5 shows how the funding level is expected to develop if DB surpluses are used to pay DC contributions when the DB funding level is above 125%.

Chart 5 shows a narrower range of funding outcomes than Chart 4:

- The really good outcomes produce more surplus than can be used to pay DC contributions and so the funding position continues to improve in these situations;

- Many of the really bad outcomes are unaffected by the mechanism because they never reach a funding level of 125% (although there are some which do which is why the first and fifth percentiles are lower in Chart 5 than in Chart 4);

- The most interesting effect is on the middle range of outcomes (i.e. those lying between the 25th and 75th percentiles). The range of these funding outcomes in 20 years' time is reduced from 51% (as would be shown on an extrapolated version of Chart 4) to just 12% (as shown in Chart 5).

This shows that using DB surplus to pay DC contributions as a mechanism for managing surpluses could potentially be very attractive for schemes where this is possible.

It also highlights the more general principle that stability can be achieved much more effectively when there is a mechanism to manage surpluses. Current UK legislation in relation to refunding surpluses from schemes does not make this easy (and we would urge the Government to look at ways in which it is possible to increase flexibility in this area, since we believe that overall it would lead to better funded pension schemes).

However, as discussed in this section, there are a variety of ways in which schemes can work within the current system to reach better outcomes.
Bringing all of the areas covered in this paper together, there are clearly many different factors for a scheme to consider in determining how to approach Pensions Stability. Each scheme will look for its own solution to take account of its priorities.

Having said this, there are some general conclusions which we can draw:

- First, true self-sufficiency represents a very high target which can be close to buy-out funding levels. In practice, a lower target is likely to be more achievable and, arguably, more useful for many schemes;
- Schemes which have planned their long-term strategy and have a common vision between trustees and sponsors are likely to make better decisions and be more successful in achieving their desired outcomes. For example, this will affect how they approach risk management opportunities such as longevity hedging and pensioner buy-ins. Accessing these when market conditions are attractive can have a significant impact on the timescales for reaching a scheme’s long-term target;
- Release mechanisms have an important role to play. These could be a DC section where contributions can be paid from DB surplus, or they could be external funding buffers such as escrow accounts. If a scheme plans to use one of these, it will need to start funding this well in advance – i.e. it may well already be the time to do this.

But what long-term funding target and investment policy should schemes be aiming for? Again, this will vary between schemes but, based on the results in this paper, we observe that for schemes looking to:

- Have a sensible balance between the needs and priorities of trustees and sponsors;
- Reach a buy-out funding position in the longer term;
- Take account of the risks and consequences of bad scenarios happening;

then it might be sensible to define Pensions Stability as being in the region of 105% of a gilts + 0.5% p.a. funding target. We have reached this conclusion by noting how many of the funding targets shown in this report are in this region, and how it offers a solution that meets the conflicting needs of all parties.

Actually, the analysis in this paper suggests that a typical Pensions Stability funding target is likely to be slightly higher than this, perhaps between 105% and 108% of a gilts + 0.5% p.a. funding target. This is because the modelling underlying this paper assumes that mortality has been hedged, whereas in practice the scheme will either need to meet the cost of this or it will need to hold a higher reserve to run the same level of overall risk.

For most schemes, this level of funding target will be:

- Some way below the full buy-out funding target. So, it may well be attractive to both trustees and sponsors as an interim step on the longer term journey to full buy-out;
- Similar to 100% of a gilts + 0% p.a. funding target. However, we prefer to express it relative to a gilts + 0.5% p.a. target since this is likely to be more consistent with the investment strategy and it highlights the split between the basic funding target and the additional funding buffer (which may be held externally).

For some schemes, this level of funding is already on the horizon and they can develop more detailed plans on how to get there and what to do when they reach it. For many other schemes, it is currently more distant but they may well already be in a position where it can and should influence their shorter term strategy and decisions.

For all schemes, Pensions Stability is likely to become an increasingly familiar concept over the coming years and we hope that the analysis shown in this paper forms a valuable first step in understanding what it will look and feel like.
Appendix A – More details of modelling

For our modelling, we have used a scheme with the following characteristics:

- **Current split of liabilities:** 50% pensioners, 50% non-pensioners;
- **The scheme has been closed to future accrual;**
- **The duration of the scheme is currently 17 years. This reduces to around 12 years by 2033;**
- **Pension increases in payment are a mix of typical DB scheme increases with the majority of pensions linked to RPI with a cap on annual increases of 5%;**
- **Deferred pension increases are linked to CPI.**

In order to carry out our modelling, we defined self-sufficiency to mean that the likelihood of the scheme having a funding deficit at the end of any of the next 20 years should be less than 1%:

- **We have focused on a 20 year timeframe (and we have assumed that actuarial valuations are carried out annually during this period). Although a scheme’s run-off period will typically be around 70 years, it is likely to be at its largest during the next 20 years;**
- **We have based our analysis on market conditions at 31 December 2013.**

In this paper we have referred to investment strategies that target a median return of ‘gilts + X% p.a.’ There are many ways to construct asset portfolios, however the broad characteristics of our portfolios are:

- **A diversified portfolio of growth assets is used to generate the outperformance over gilts. The outperformance determines the amount to be held in growth assets;**
- **Interest rate and inflation exposure is hedged using gilt and swap market instruments. Typically, a small amount of leverage is required to cover the liability exposures.**

We use stochastic modelling to generate a distribution of possible outcomes:

- **The model projects assets and liabilities forward over time and enables us to examine the funding level (assets divided by liabilities). A sample single projection is shown below;**

![Graph showing funding level over time]

- **We run 5,000 simulations taken from the Aon Hewitt Asset Model to build up a picture of the future financial behaviour of the scheme. These simulations have been plotted on the chart below;**

![Graph showing distribution of outcomes]

- **To make sense of the above outcomes, we sort the simulations from good to bad and plot the percentiles on a graph.**
The bottom red line shows the 1st percentile in each year and the black line at the bottom of the shaded area is the 5th percentile;

Our definition of self-sufficiency is that a simulation has failed if it falls below 100% in any of the next 20 years;

From this we can work out the required initial funding level which is consistent with this definition.

In the above chart, the scheme funding level is set to 110% at the start. Over the course of the next 20 years, 1% of outcomes will at some time dip below 100% funding.
The Aon Hewitt Asset Model has been designed so that the following desirable technical features are exhibited:

- It is complete and consistent. All the major markets and asset classes are modelled within a consistent framework allowing for the interactions between them to be properly taken into account;
- It models the full yield curve as this allows for an accurate treatment of the liabilities and realistic modelling of the future distribution of interest rates and inflation. It also allows us to accurately assess the sensitivities of the assets and liabilities to changes in interest and inflation rates;
- It is arbitrage free;
- It captures the fact that extreme market events occur more frequently than would be predicted by simpler statistical models;
- It does not overestimate the upside potential of different investment strategies or understate the risk;
- Where appropriate it allows for expected manager outperformance of a market due to active management skill;
- It is a very powerful model in that it allows for the modelling of derivative strategies including Liability Driven Investment solutions involving swaps;
- Investments are assumed to be rebalanced annually and cashflows are taken proportionally from all assets.

We have been using our current model, with developments, since 2005. The economic scenario generator that we use in our asset liability modelling is provided by a third party supplier, Barrie & Hibbert. They provide a suite of models from which we select those that we believe are the most appropriate. The models are then calibrated to our proprietary assumptions.

Aon Hewitt’s ‘Capital Market Assumptions’ are used as the basis for our stochastic asset-liability modelling and contain our asset class return, volatility and correlation assumptions. The return assumptions are ‘best estimates’ of annualised returns, by which we mean annualised median returns. That is, there is a 50/50 chance that actual returns will be above or below the assumptions. The assumptions are long-term assumptions, based on a 10 year projection period. They are updated on a quarterly basis but may also be updated on an interim basis in extreme circumstances.

Our asset class assumptions are assumptions for market returns. The exceptions to this are the private equity and hedge fund assumptions where, due to the nature of the asset classes, potential manager outperformance needs to be incorporated. However, when we undertake the stochastic modelling we are able to incorporate an allowance for manager outperformance on any asset class if required.

Assumptions are produced for bonds, equities, property and alternative asset classes. The assumptions are formed at a regional level for the UK, US, Europe, Japan, Canada and Switzerland. We also produce equity market assumptions for Emerging Markets.

We use data from a wide range of sources when formulating the Capital Market Assumptions including the Bank of England, the Federal Reserve Bank of Philadelphia’s Survey of Professional Forecasters, Consensus Economics, the Institutional Brokers’ Estimate System (I/B/E/S), Investment Property Databank (IPD) and research produced by a range of investment banks and research institutes. Note that this list is not exhaustive and is subject to change.

We produce quarterly reports which set out our Capital Market Assumptions and the rationale behind them in more detail. Please contact one of the authors on page 2 if you would like to receive a copy.
Appendix B – Other points to consider about Pensions Stability

As part of our research into, and the modelling of, self-sufficiency and Pensions Stability strategies, we have identified a number of other conclusions in relation to these low risk strategies:

1. Investment matters.

If a scheme is targeting a return of gilts + 0.5% p.a., then it could be that less than 15% of its assets are in return seeking investments. There are likely to be a number of different diversified investment strategies which could potentially form the basis for a Pensions Stability portfolio in these circumstances.

Having said this, when measured relative to the target return above gilt yields, investment strategy decisions remain important. For a scheme with 15% of its assets in return seeking investments, annual outperformance of 1% on these assets will contribute 0.15% to the scheme’s overall return – i.e. almost one-third of its overall annual target return of 0.5% p.a. above gilts. And, as hinted at above, the benefits of diversification remain important, with a well diversified strategy enabling schemes to target the same level of return for a lower level of risk.

2. Mortality risk cannot be ignored.

Either mortality risk will need to be hedged (which has a cost attached) or it will form a material part of a scheme’s risks in a low risk environment (which will increase the additional funding buffer which needs to be held).

3. Assumptions can drive reality.

It matters which way the actuarial basis (i.e. the assumptions used to calculate the liabilities) is set. Most actuarial bases are set relative to gilt or swap yields. Because our modelling assumes that we have fully hedged interest rate and inflation risks, the results tend to favour investment strategies which are reasonably well correlated with cash.

However, insurers tend to hold longer dated credit (e.g. corporate bonds). When we carried out further modelling using an actuarial basis that includes an allowance for corporate spreads, the results begin to favour investment strategies which also contain corporate bonds and other types of credit assets.

This is an area for actuaries – and others, including the Pensions Regulator – to consider further.

4. Cash counts.

Managing liquidity and cashflow requirements becomes ever more critical for mature schemes. As a scheme matures, a larger and larger proportion of its assets will be paid out each year as benefits – for more mature schemes, paying out 5% of assets each year would not be unusual. In the absence of contributions from the sponsoring employer, investment income is increasingly unlikely to meet these cashflow requirements by itself. The particular risk is that schemes need to sell assets at low points in market cycles and once those assets have been sold, they will not be able to benefit from any subsequent market recovery.
Appendix C – Pensions Stability, the buy-in market and taking advantage of market opportunities

In practice, many schemes will not be looking to wait until they reach the full buy-out funding position to access the insurance market. Instead, there has been a rapid growth in recent years of schemes purchasing buy-in policies, particularly for some or all of their pensions in payment. These bulk annuity policies are held as an asset of the scheme with the intention that they can be transferred to members as and when the scheme finally buys out.

We believe that holding these policies makes sense (at the right price) for schemes which passively hold gilts and do not expect to use them as collateral for a hedging programme. However, for schemes which are looking to manage their bonds more dynamically or may potentially need them for collateral, these policies may tie schemes’ hands and result in sub-optimal outcomes.

One of the attractions of purchasing buy-in policies is that it allows schemes to purchase them at times when market conditions are favourable. In the past six years, pensioner bulk annuity prices (when measured relative to gilt yields) have varied by over 10%.

For a gilts + 0.5% p.a. investment strategy, we have examined what happens if the scheme is able to secure its annuity policies at times when annuity prices are 5% cheaper than current market prices (when measured relative to gilt yields). The results are shown in Table 8.

Table 8: Probabilities of reaching buy-out

<table>
<thead>
<tr>
<th>Initial funding position</th>
<th>Likelihood of funding reaching buy-out position in the next 10 years</th>
<th>Likelihood of funding reaching buy-out position in the next 10 years if annuities are secured at 5% cheaper prices</th>
</tr>
</thead>
<tbody>
<tr>
<td>£110m</td>
<td>35%</td>
<td>80%</td>
</tr>
<tr>
<td>£107m</td>
<td>16%</td>
<td>49%</td>
</tr>
<tr>
<td>£106m</td>
<td>12%</td>
<td>34%</td>
</tr>
<tr>
<td>£104m</td>
<td>8%</td>
<td>19%</td>
</tr>
</tbody>
</table>

* Where £100m is 100% of a gilts + 0.5% p.a. funding target

The conclusions that we would draw from Table 8 are that:

- Being able to access the buy-in market when market conditions are favourable can make a significant difference to the likelihood of reaching buy-out (or, alternatively, the contributions required to reach buy-out);
- The challenge for schemes is therefore to be able to access this market at times when market conditions are favourable. In practice, our experience is that this is most likely to happen when:
  - The trustees and sponsor have agreed how this fits into their overall strategy and what counts as favourable market conditions;
  - The scheme is ready to act including ensuring that the data has been cleaned – for example, with up-to-date information on spouses.