



Constructing buyout-ready portfolios for the endgame

As defined benefit (DB) schemes adopt a holding pattern ahead of a potential buyout, our Solutions team – making use of their modelling frameworks – share their insights into how they believe schemes can best invest to meet their objectives.

DB pensions: Approaching an inflection point

With dramatically improved funding levels, thanks in large part to the significant rise in gilt yields over the past 18 months alongside a partial recovery in risk-asset prices, the DB market is approaching an inflection point. The demand from schemes that are already – or soon will be – in surplus on a buyout basis is a multiple of the annual capacity of the pension risk transfer (PRT) market.

To put this in context, The Pensions Regulator estimates that over a quarter of all DB schemes could now be more than fully funded on a buyout basis¹, which could amount to £350bn of demand versus an estimated annual pension risk transfer market capacity of around £60bn, according to estimates by LCP². Indeed, the volume of insurance policies that insurers may be able to write each year feels like a rounding error when it comes to the c.£1.4 trillion of DB pension scheme assets³, given that over 75% of schemes have now recognised buyout as their likely ultimate end state⁴.

In addition to the capacity constraints, there are two further reasons why schemes may be unable to buy out in the near term:

- Data issues need to be sorted – records must be complete and accurate
- Illiquid assets in the scheme that insurers won't accept as payment, or will only accept with a hefty haircut, need to be run off or sold

While many pension schemes therefore are, or soon could be, fully funded on a buyout basis, they may not be able to transact immediately. As a result, we're likely to see schemes adopting a holding pattern as they prepare for a potential buyout. The fundamental question is therefore: How should schemes invest as they approach their buyout endgame?

In this paper, we discuss some of the options available to schemes, and present a quantitative modelling framework that can help inform schemes as they consider their DB endgame strategy. We find that buyout-ready strategies are scheme- and belief-specific but normally might opt to have high interest rate and inflation hedge ratios, a sizeable allocation to investment-grade public credit and, in many cases, other diversifying sources of excess return potential.

1. Source: [TPR Annual Funding Statement 2023](#)

2. Source for figures: [Insurance enters a new phase – a skyrocketing market](#) | Lane Clark & Peacock LLP ([lcp.com](#))

3. Source: [PPF 7800 index as at 31 July 2023](#)

4. Source: [Hymans Robertson Risk Transfer Report 2023](#)

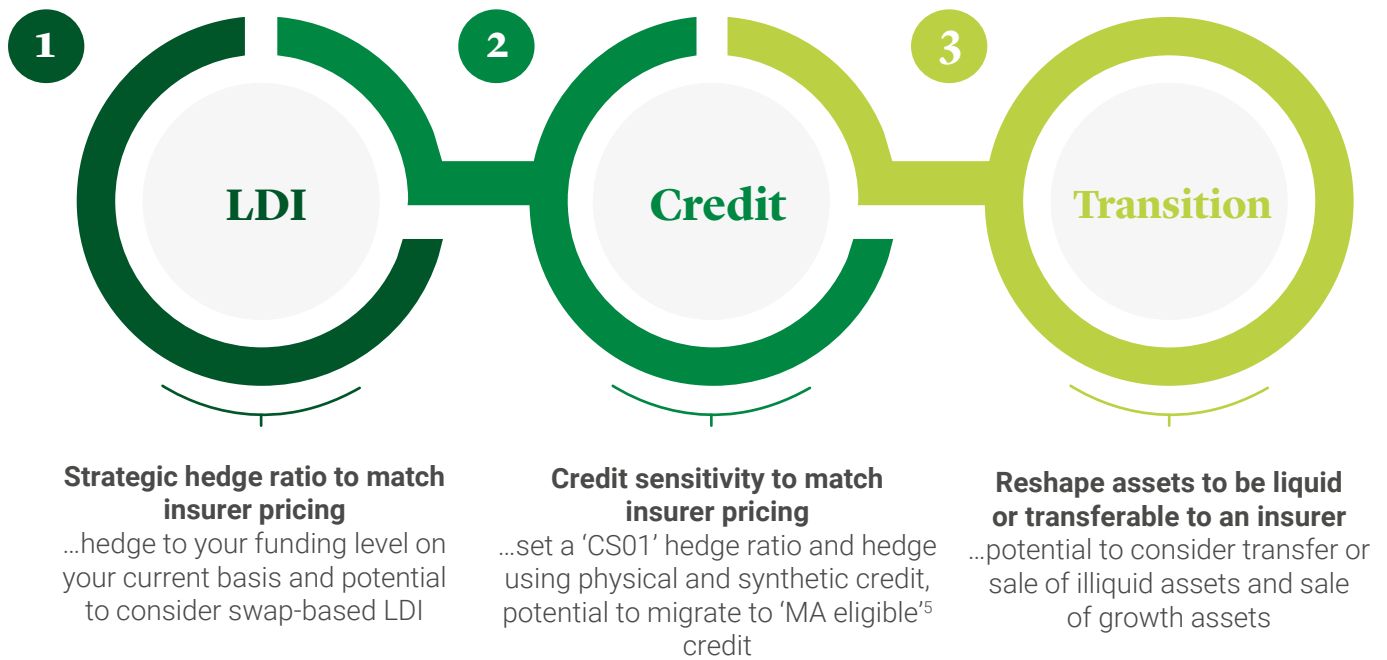
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Buyout aware?

The natural response to this situation may be a ‘buyout-aware’ (BOA) strategy, which can be defined as a hedging strategy that seeks to minimise short-term volatility relative to insurer pricing. This involves a mix of public investment-grade credit and liability-driven investment (LDI), with the ideal mix potentially varying with the duration of the scheme (see Appendix A for details). Under a BOA approach the key components are hedging rates and inflation risks, seeking to hedge credit sensitivity of the liabilities and reshaping assets to be liquid and transferable to an insurer:



Buyout aware: Invest 'like an insurer'



Investment themes for illustration purposes only, actual buyout investment strategy will be bespoke for each scheme.

In practice, matching the credit sensitivity can be challenging for longer-duration schemes but the idea is to reduce risk relative to buyout pricing drivers as much as possible.

We believe that such a hedging strategy could be a good starting point for schemes in their holding pattern. However, in general the aim of schemes is not ‘funding level volatility minimisation’ but paying pensions. As a result, a pure BOA approach isn’t always the best one in our view.

In contrast to BOA, a ‘buyout-ready’ strategy could be defined as one designed to optimise overall outcomes, as opposed to simply minimising short-term funding level risk. Finding an ideal buyout-ready strategy is no easy matter. As we shall see, the answer depends on a scheme’s circumstances, beliefs, and constraints.

No buyout-aware strategy eliminates risk

Achieving zero risk before buyout is impossible. Reasons for this include longevity uncertainty, unhedgeable moves in buyout pricing and the credit risk on corporate bonds (they can default but liabilities won’t). Another complication is that many schemes don’t know their buyout position. The scheme actuary can make a rough estimate, or the trustees can request indicative quotes from insurers, but obtaining accurate pricing is a significant exercise and can be challenging unless the insurer is confident the transaction will progress.

5. Matching adjustment (MA) allows insurers to take upfront credit for investment returns that will take decades to be realised. Its impact can be vast when applied to long-dated obligations such as pensions.

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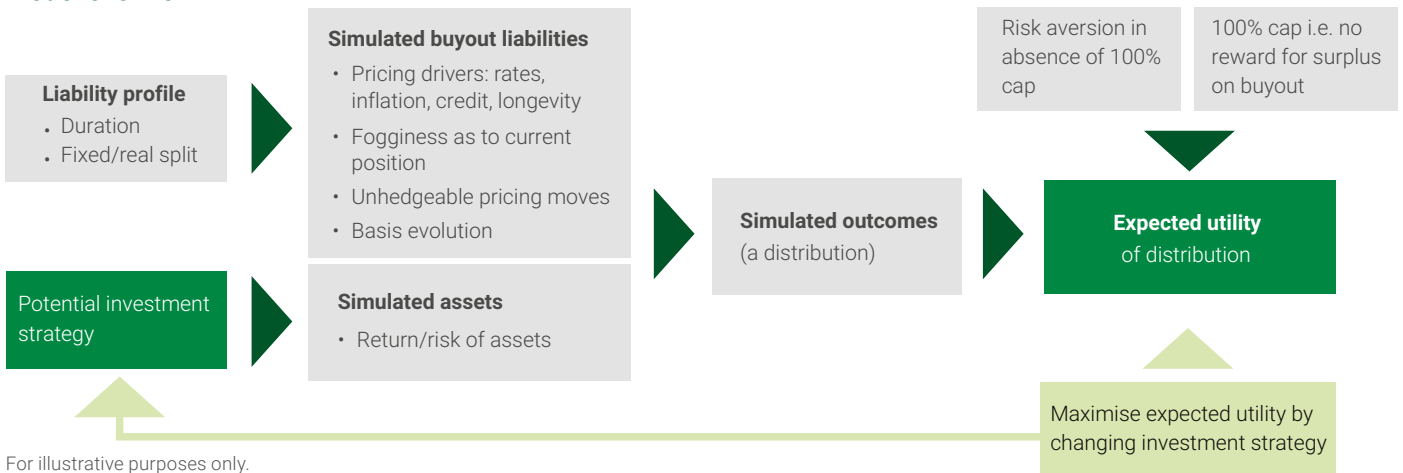


Outcome-focused

We believe it's important to focus on 'ultimate outcomes'. Here this involves studying the range of potential buyout funding levels at the projected point at which the trustee believes buyout can finally happen.

Let's now consider a method which seeks to optimise the investment strategy of schemes in a holding pattern. This involves modelling thousands of potential economic and demographic scenarios and choosing the investment strategy that seeks to offer the most potentially attractive outcome distribution. A high-level overview of this approach is shown below:

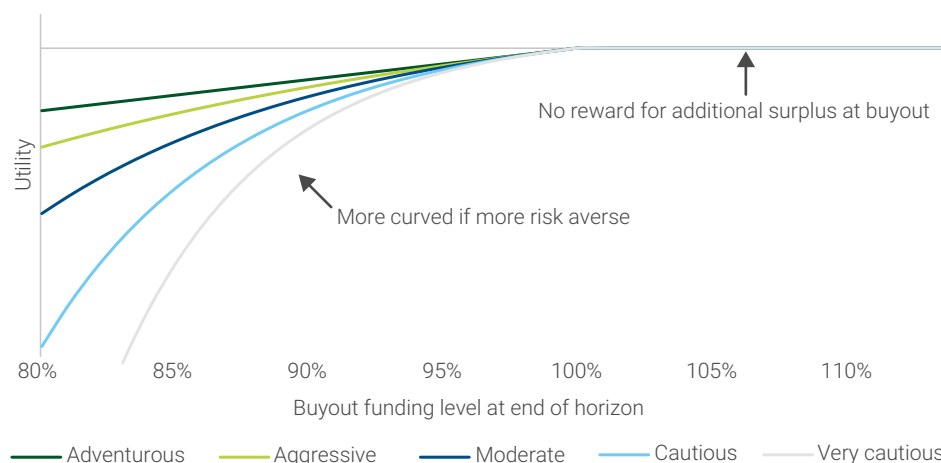
Model overview



For illustrative purposes only.

A key feature of this framework is that we don't assign greater worth (or 'utility' in economics speak) to a scheme being overfunded. For example, being 105% funded at the point of buyout doesn't count for more than being 100% funded. This reflects a view that the priority should be the security of promised benefits and the scheme shouldn't run unnecessary risk. Below 100% funding the utility assigned depends on risk appetite, with more curved shapes⁶ reflecting greater risk aversion:

Utility functions considered



Risk appetite in absence of cap	Risk aversion parameter
Adventurous	0
Aggressive	4
Moderate	8
Cautious	12
Very cautious	16

For illustrative purposes only.

This model embeds a number of assumptions regarding [longevity risk](#) and how it varies with scheme maturity, the credit sensitivity of liabilities' unhedgeable buyout price risk, uncertainty as to the current buyout position and our capital market assumptions for the short and long term. Appendix B lists some of the features we capture.

6. We use [power utility functions](#)

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Projecting outcomes

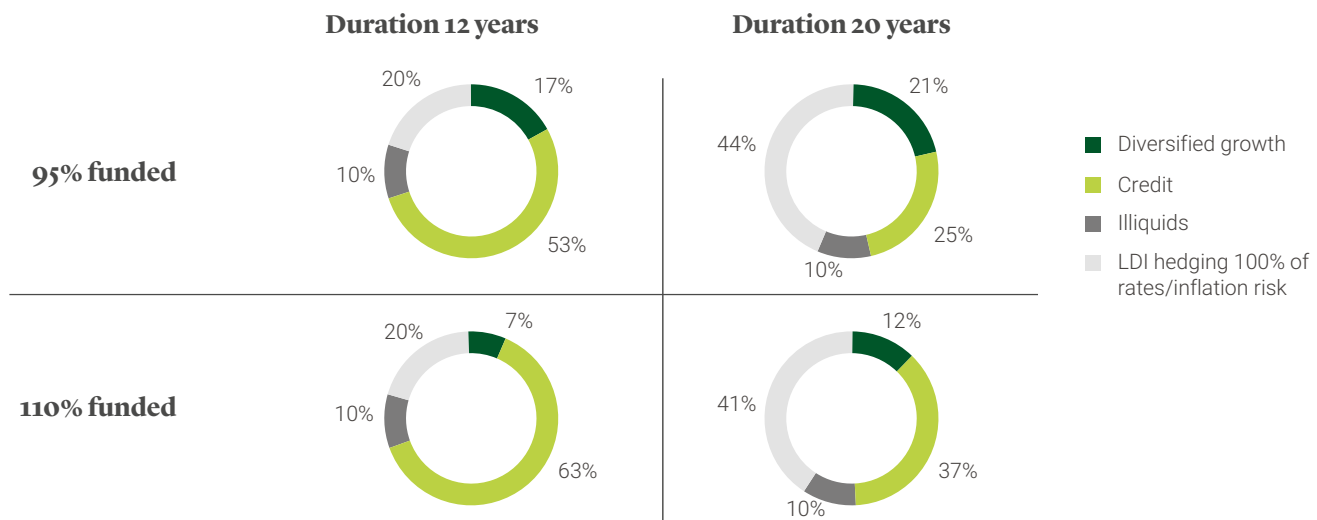
The model projects pension scheme outcomes, capturing the aspects discussed above. It is a ‘completion strategy’ in the sense that it optimises a completion portfolio around any illiquid assets currently held. For this we use three key building blocks⁷:

1. A multi-asset diversified growth strategy. This includes an allocation to investment grade public credit but only for diversification purposes
2. Investment grade public credit. This allows schemes to ‘bias’ towards credit. This can make sense for schemes in the endgame
3. LDI to seek to hedge rates and inflation risks

Illustrative results

For illustration, we consider four example schemes with durations of 12 or 20 years and estimated initial funding levels of 95% or 110%. We’ve assumed an anticipated time horizon to buyout of five years and that 10% of scheme assets are in illiquid assets that they don’t want to sell and so must complete around. Other parameters are given in Appendix C.

Optimised completion strategies



Source: LGIM calculations at 30 June 2023

Key features for the optimal strategies, reflected in the above chart, are:

Credit: Relatively high investment grade public credit allocations – for comparison the purple book indicates that a typical scheme holds only 22% of assets in corporate bonds⁸. This reflects a desire to hedge the credit sensitivity in buyout liabilities. Appendix A outlines our research in this area. Even conservative estimates of the sensitivity result in more than 22% of assets in credit by market value

LDI: Full hedging of interest rate and inflation risk

Diversified growth: Maintaining some exposure to diversified growth even when estimated to be overfunded, owing to residual risks, including uncertainty as to the current funding level.

There is, unsurprisingly, considerable overlap with BOA strategies. Key differences are a completion around illiquid assets, an allocation to other diversifying return drivers and a move away from short-term risk minimisation.

Comparing and contrasting allocations under different circumstances can be difficult because there are multiple factors at play. However, in the next section we explain the likely influence of changes in circumstances and beliefs which help to explain the portfolios above and, more generally, the strategies the framework suggests.

7. For simplicity we have not considered investment in credit default swaps (CDS).

We have also assumed no partial buy-ins. Partial buy-ins have fallen out of favour given the pressure they can place on liquidity.

8. Purple book 2022

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Strategies vary with circumstances and beliefs

We stress that the ideal strategy varies with both scheme circumstances and beliefs.

The table below outlines how different factors can impact the answer:

Type of factor	Factor / parameter	Influence
Circumstances	Scheme duration	The impact of scheme duration can be complicated as it has multiple impacts including on longevity risk. In the absence of leverage constraints higher durations tend to promote higher credit allocations by market value because the amount you need in credit to hedge moves in buyout prices goes up ⁹ . Leverage constraints can prevent this however, particularly as a higher percentage in LDI tends to be needed at higher scheme durations.
	Allocation to illiquid assets	The more in illiquid assets there are, the less there tends to be growth and credit as a completion strategy. This is because the illiquid assets have some of these risk exposures.
	Estimated current funding level	Higher funding levels tend to lead to holding less in growth assets ¹⁰ as there is less upside opportunity relative to downside risks at higher funding levels.
	Time horizon to buyout	The impact is complicated. For example, for underfunded schemes a longer horizon can potentially lead to less in growth as the 100% cap is more likely to bite over longer horizons. For overfunded schemes a short horizon promotes a BOA strategy.
	Required headroom on LDI	The greater the required headroom the less leverage there is and the more that should potentially be held in LDI, rather than return-seeking assets in our view.
	Risk aversion parameter	Greater risk aversion tends to lead to holding less in growth assets ¹¹ .
Belief/assumption	Estimated credit sensitivity of buyout liabilities	Higher assumed credit sensitivity of buyout liabilities tends to lead to higher credit allocations to help hedge moves in buyout prices.
	Magnitude of uncorrelated risks (longevity, initial funding level uncertainty etc)	Greater uncorrelated risks tend to lead to more in growth assets. For example, longevity risk can cause an overfunded scheme to become underfunded. In the absence of a longevity hedge it can make sense to target a higher return.
	Capital market assumptions	Directionally moves as you would expect e.g. a higher equity risk premium tends to lead to more in equity, all else equal. Changes in correlations e.g. between equities and credit can have more complex effects.

This analysis is not exhaustive. For example, we've assumed the priority is securing existing benefits so attached no utility to surpluses at the point of buyout. However, there are [growing noises](#) that this needn't be the only approach. For example, the money could potentially be used to enhance existing benefits or help fund defined contribution (DC) schemes of the same employer who are generally on track for worse outcomes in retirement. This would, in general, tend to lead to more aggressive strategies.

Acting in the other direction, behavioural factors such as loss aversion and regret risk, could lead to trustees opting for a more cautious approach, as could a weaker sponsor covenant.

Conclusion

Buyout-ready strategies are scheme and belief-specific in our view. At a high level our analysis suggests that they should normally have high interest rate and inflation hedge ratios and a sizeable allocation to investment-grade public credit. However, there are other interesting nuances, such as the influence of uncorrelated risks and uncertainty in the buyout position that can mean an allocation to other growth assets makes sense. There is also often a need to complete around illiquid assets.

All models must be taken with a pinch of salt, of course but we believe our quantitative framework can act as a useful starting point for schemes approaching their buyout endgames.



John Southall
Head of Solutions Research

9. This is despite CS01/PV01 falling, as the duration of the credit held is typically relatively fixed and shrinks relative to the liability duration

10. For extremely high funding levels, the strategy becomes a pure buyout-aware one.

11. The risk aversion here relates to aversion in the absence of the 100% cap we place on funding level outcomes.

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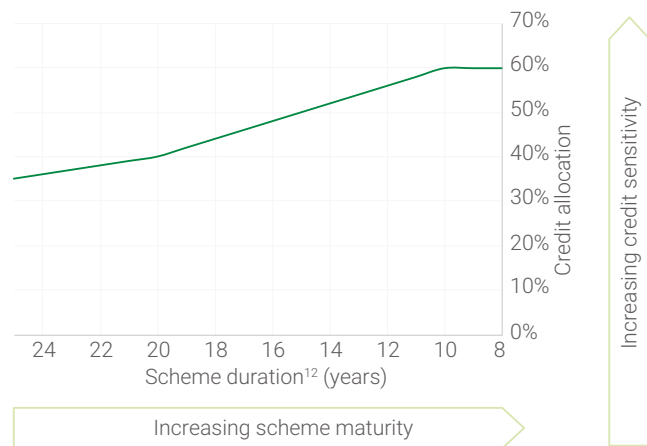
Appendix A: The credit sensitivity of buyout liabilities

There are several approaches that can be taken to estimate the credit sensitivity of buyout (and buy-in) liabilities to moves in credit spreads.

One approach, that we outlined in [this blog](#) is to study typical asset allocations underpinning the pricing portfolios underpinning Legal & General’s Affordability Index. We allow for the fact that direct investments (DI) have a credit-like beta and adjust for various other factors, including a risk that the insurer doesn’t pass all changes in yield through to pricing.

Strategic model based on L&G Affordability index

Buyout ‘CS01’ as a proportion of liability PV01



CS01 target: 40-60% of PV01, depending on duration (derived from typical asset allocations underpinning the L&G Affordability Index)

Sources: (1) See our blog: [The endgame is nigh: time to pay more attention to credit?](#) Analysis shows typical CS01 characteristics of a pricing portfolio based on historic asset allocations and durations underpinning L&G’s affordability index – an index that is used as a first order indication of L&G’s typical level of pricing at a point in time. (2) LGIM analysis. FTSE UK Level Annuity Index, unadjusted single life annuity, composite of 17.5% early retirement, 52.5% standard retirement, 30% late retirement. See <https://research.ftserussell.com>, and [FTSE UK Level Annuity Index](#).

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A pragmatic approach is required as each insurer’s asset allocation is different and different methods and assumptions lead to substantially different answers.

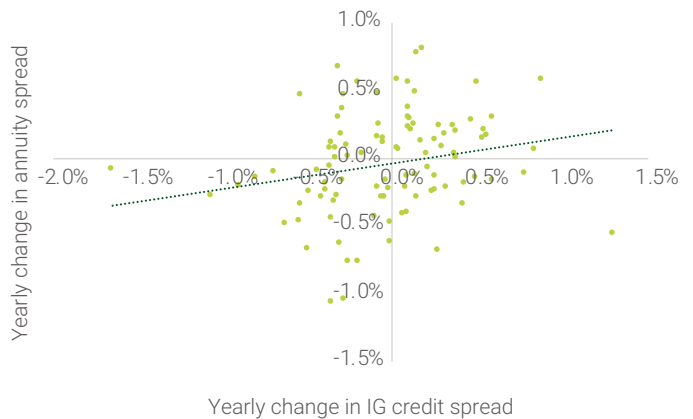


This gives a CS01 target of 40-60% of liability PV01, depending on the liability duration.

Observing annuity prices is another potential approach that tends to give lower numbers. However, the data is extremely noisy. This makes it challenging to pin down an average sensitivity with confidence:

Observing live annuity prices - it's noisy

FTSE level annuity index: change in implied annuity spread vs. IG credit spreads



CS01 target: c.30% of PV01 for an 11-year duration liability profile (but wide confidence interval: 90% certain that the ratio lies between 0% and 70%)

12. Duration measured using yields at 30 June 2022. Corresponding durations at 30 June 2023 are lower due to convexity impacts.

Appendix B: Features allowed for

Features allowed for (not exhaustive)

Use of expected utility theory to optimise strategies, including:

- No reward for excess funds following buyout.
By capping outcomes at 100% we assume securing existing promises is the top priority
- Different potential levels of risk aversion in the absence of the cap, by using power utility functions with different risk aversion parameters

Optimisation completes around illiquid assets held

Longevity uncertainty and how this is greater at higher durations

The sensitivity of solvency liabilities to credit spreads and how this varies with scheme duration

Mean reversion of credit spreads

Unhedgeable changes in solvency pricing

The unwind of solvency basis and the weakening of the solvency basis over time, acting as a tailwind to funding levels

Investment risk modelling including downgrade and default risk on credit

The expected excess return on each potential strategy

Collateral constraints expressed in terms of basis points to exhaustion

Rates hedging from corporate bonds held

Credit beta from public credit, liquid growth, and illiquid assets

Appendix C: Parameter values

Below are the key parameters chosen for our illustration. There are others unlisted such as our capital market assumptions and the volatility of unhedgeable moves in buyout spreads.

Credit sensitivity of buyout liabilities	Uses a strategic model based on the pricing portfolios in the L&G Affordability index. This gives relatively high sensitivities compared with other models.
Illiquid assets to complete around	10% secure income (real estate debt, infrastructure debt and corporate debt). We are assuming this is what the scheme holds for illustration (as opposed to it being a recommendation)
Anticipated time horizon to buyout	Five years
Uncertainty in current Buyout FL	Two-thirds chance within 2.5% of estimate
Constraints	Only leverage of LDI permitted, with a headroom of at least 350bps
Risk aversion	Moderate (parameter = eight)
Other	Liabilities 60% real. No deficit contributions.

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